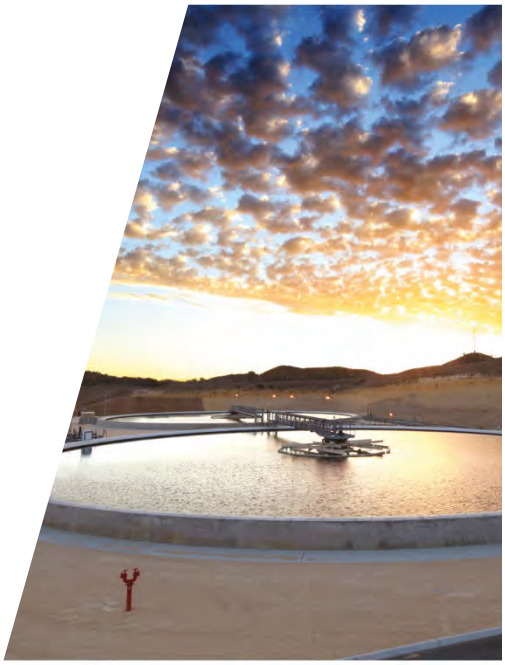

Phase II Environmental Site Assessment

Wellington Street West Buried Drum Site
Guelph, Ontario

The Corporation of the City of Guelph

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1. Introduction

GHD Limited (GHD) was retained by the Corporation of the City of Guelph (City) to conduct a Phase II Environmental Site Assessment (ESA) of the Wellington Street West Buried Drum Site that joins Historical Landfill Sites 8 and 9, in Guelph, Ontario (Site or Property). Compass directions (north, east, south, and west) described herein are referenced to “Project North”, which is assumed to be perpendicular to Wellington Street West. A Site location map is provided on Figure 1 and a Site plan is provided on Figure 2.

This Phase II ESA was performed in general accordance with the Canadian Standards Association (CSA) Standard Z768-01. The purpose of the Phase II ESA was to confirm the presence or absence of environmental impairment associated with the potential areas of environmental concern identified during the Phase I ESA completed by GHD.

This report documents the Phase II ESA scope of work, including all field activities and laboratory analytical data generated therefrom. Conclusions regarding the environmental status of the Site are then presented based on the findings of the Phase II ESA.

1.1 Site Description

Historical Landfills referred to as the Historical Landfill 8 and 9 are located north of Wellington Street West, west of Edinburgh Road South and east of the Hanlon expressway, respectively. The City refers to the boulevard north of Wellington Street West that joins the former landfills as the Wellington Street West Buried Drum Site.

In September 2014, several buried drums were exposed during construction of the York Trunk Sewer Paisley-Clythe Watermain on the north side of Wellington Street West, between Waterloo Avenue and Edinburgh Road South and adjacent to Howitt Creek. Eight drums were inadvertently punctured by an excavator bucket, resulting in a release of green-blue coloured liquid with a sweet solvent or fuel-like odour. Laboratory analytical results indicate the fluid contained, at a minimum, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

Following the incident, a geophysical survey of the area and a subsurface investigation to assess the soil quality in the watermain area were conducted. Additional drum removal and soil remediation, comprised of hot spot soil removal and disposal at a licensed facility, was completed in 2015. At the conclusion of the 2015 remediation activities, 41 drums, 800 tonnes of contaminated soil, and 35,000 litres (L) of groundwater were removed from the excavation along the watermain alignment. Residual soil impacts above the Ministry of the Environment, Conservation and Parks (MECP) generic standards were left in place following the 2015 remediation activities.

1.2 Previous Studies

The 2018 Phase I ESA completed by GHD identified the following potential areas of environmental concern associated with the Site:

- Two spills were identified in the Environmental Risk Information Services Ltd. (ERIS) Ontario Spills (SPL) database to be associated with the Site. One record was for a 400 L spill of an unknown substance to the road and sewer on Waterloo Avenue within Historical Landfill Site 9 in

1994. One record is associated with the Wellington Street West Buried Drum Site, when several buried drums were exposed during construction of the York Trunk Sewer Paisley-Clythe Watermain in 2014. These spills represent a potential soil and/or groundwater impairment concern.

- The fire insurance plans (FIPs) and the historical city directories reviewed indicate Sterling Rubber Co Ltd., a rubber manufacturing facility, was formerly located adjacent to/north of the Wellington Street West Buried Drum Site from at least the early 1900s to the mid 1970s. Rubber manufacturing and processing on an adjacent property represents a potential groundwater impairment concern, if releases have occurred and migrated onto the Site.
- Historical city directories indicate Rifle Ranges was formerly located adjacent to/north of the Wellington Street West Buried Drum Site in 1945. The former Rifle Ranges property on the adjacent northern property represents a potential groundwater impairment concern, if releases have occurred and migrated onto the Site.
- Based on review of historical reports, 41 buried drums of an unknown liquid were exposed at the Site during construction of the York Trunk Sewer Paisley-Clythe Watermain within the Wellington Street West Buried Drum Site (MMM Group Limited, September 2015). Between 2014 and 2015, the drums were removed along with impacted soil and groundwater that entered the excavation. However, some soil impacts remained at the Site following initial remedial efforts. The potential presence of additional drums and impacted soil within and in the vicinity of the Wellington Street West Buried Drum Site represents a known soil and potential groundwater impairment concern.
- Based on review of historical reports, Historical Landfill Site 8 was landfilled between 1959 and 1960 and Historical Landfill Site 9 was landfilled with municipal solid waste between 1960 and 1962. Former landfilling activities at Historical Landfill Sites 8 and 9 represent a potential groundwater impairment concern, if releases occurred and migrated onto the Site.
- During the Site inspection, GHD noted that at least one residential property on Bristol Street has evidence of potential existing or former fuel oil tanks. The storage and handling of bulk quantities of petroleum hydrocarbons at nearby properties represents a potential groundwater impairment concern, if releases have occurred and migrated onto the Site.

GHD completed a Geophysical Investigation in the area of the Wellington Street West Buried Drum Site between May 2 and 30, 2018. The purpose of this investigation was to determine the presence (or absence) of buried drums/metallic objects in the area of the Wellington Street West Buried Drum Site that was not previously investigated. In order to achieve this objective, GHD completed two electromagnetic (EM) surveys and a ground penetrating radar (GPR) survey. The EM61 and GPR survey results showed strong evidence of suspected buried metal/drums in the north area of the Wellington Street West Buried Drum Site. The Geophysical Investigation Report is provided in Appendix A.

1.3 Project Objectives and Scope of Work

The purpose of the Phase II ESA was to confirm the presence or absence of environmental impairment associated with the potential areas of environmental concern identified during the 2018

Phase I ESA, specific to the Wellington Street Buried Drum Site. The findings from Phase II ESA activities associated with Historical Landfill Sites 8 and 9 will be provided under a separate cover.

The following activities were completed as part of the Phase II ESA:

- Preparation for field work including subcontractor procurement, clearance of underground utilities and preparation of a Site-Specific Health and Safety Plan (HASP)
- Well gauging using an electronic oil/water interface probe to determine the depth to water and confirm the presence or absence of light non-aqueous phase liquid (LNAPL) and/or dense non-aqueous phase liquid (DNAPL)
- Advancement of four boreholes/coreholes to facilitate the collection and screening of soil samples and to document geologic conditions at the Site
- Instrumentation of four boreholes/coreholes as monitoring wells to facilitate the collection of groundwater samples and to document hydrogeological conditions at the Site
- Submission of soil and groundwater samples to an accredited laboratory for analyses of selected parameters including VOCs, SVOCs, petroleum hydrocarbons (PHCs), polychlorinated biphenyls (PCBs), metals and inorganics, chloride, grain size, conductivity, cyanide, sodium adsorption ratio (SAR), and pH.
- Assessment of the soil and groundwater analytical data with respect to current MECP Standards

Phase II ESA field activities were completed between April 4 and June 1, 2018. A complete description of the Phase II ESA field activities and the analytical data generated therefrom are provided in the following sections.

2. Field Investigation Methodology

2.1 Project Initiation

This task included preparation of a Site-specific HASP and utility clearances.

2.1.1 Site-Specific Health and Safety Plan

A vital element of GHD's health and safety procedures is the implementation of a HASP. The HASP specifies protective measures and procedures to be followed during field activities that minimize exposure of workers and the surrounding community to potentially hazardous materials and or activities.

A Site-specific HASP was developed prior to the initiation of the subsurface investigation. The HASP addressed the tasks to be performed and establish the methods and procedures to be implemented to safely conduct each task. For the completion of the work, GHD field staff followed all applicable safe work practices identified in the HASP.

2.1.2 Utility Investigation

Prior to initiating subsurface activities, all applicable utility companies (gas, telephone, water, and sewers) were contacted to demarcate the locations of their respective underground utilities. GHD

also arranged for Down Under Pipe and Cable Locating Ltd., a private utility locating contractor, to demarcate any on-Site utilities within the proposed work areas.

2.2 Soil Quality Investigation

Altech Drilling and Investigative Services Ltd. of Cambridge, Ontario was retained by GHD to provide drilling services for the advancement of boreholes and installation of groundwater monitoring wells at the Site. In total, four boreholes were advanced at the Site between May 3 and May 30, 2018 under GHD supervision to facilitate field screening of soils and the selection of soil samples for laboratory analyses to document the presence or absence of soil impairment. The approximate locations of the boreholes, identified as MW4-18 to MW7-18, are shown on Figure 2.

The locations of boreholes advanced as part of the Phase II ESA were selected to investigate those potential areas of environmental concern identified during the 2018 Phase I ESA.

A track mounted Diedrich D-120 was utilized to advance boreholes. Soil samples were collected continuously at each borehole. Non-dedicated in-hole equipment was decontaminated between each investigation location using Alconox and water. GHD personnel donned a new pair of disposable latex gloves prior to collecting each sample for field screening.

Soils encountered were classified in accordance with a modified Unified Soil Classification System and were qualitatively and quantitatively screened in the field for the presence of petroleum and/or chemical impact. Qualitative screening consisted of visual and olfactory observations while quantitative screening consisted of using a photoionization detector (PID) to measure the concentrations of undifferentiated VOCs in the headspace of collected soil samples. The stratigraphic logs included in Appendix B document the soil types encountered along with field screening observations and soil sample intervals selected for laboratory analyses.

Select soil samples were placed into pre-cleaned sample jars provided by the laboratory. Methanol field preservation was used for soil samples selected for analysis of volatile constituents (i.e., PHC F1 and VOCs). The samples were packed on ice in a cooler, and submitted under chain-of-custody (COC) protocol to ALS Limited (ALS) in Waterloo, Ontario for analysis as described in the field sample key (Table 1).

2.3 Groundwater Quality Investigation

Between May 1 and May 30, 2018, four boreholes were instrumented as groundwater monitoring wells. The locations of the monitoring wells are shown on Figure 2 and the monitoring well instrumentation logs are included in Appendix B.

The locations of new monitoring wells advanced as part of the Phase II ESA were selected to determine groundwater flow direction and to screen for the presence of environmental impairment associated with those potential areas of environmental concern identified in the 2018 Phase I ESA. Monitoring wells were located to assess groundwater quality migrating onto and off of the Site in order to assess impacts to the Site from off- and on-Site areas of potential environmental concern, respectively.

Monitoring wells MW4-18 through MW7-18 were installed under GHD supervision and were advanced through overburden and weathered bedrock soils using 10.8 centimetre (cm) (4.25-inch)

inside diameter hollow stem augers (HSAs). Monitoring well MW7-18 was installed within component bedrock using a 7.62 cm (3-inch) down-the-hole drill (DTH).

Each groundwater monitoring well was constructed with a 51-millimetre (mm) diameter polyvinyl chloride (PVC) riser pipe, and 51 mm diameter No. 10 slot, PVC well screen with No. 2 silica sand. Monitoring well screens were no more than 3.05 metres. The ground and top of riser elevations (i.e., reference elevations) of all monitoring wells were surveyed for horizontal and vertical control.

Following monitoring well installation, monitoring wells were monitored for groundwater recovery. Once monitoring wells recovered, the depth to groundwater was recorded and all monitoring wells were developed using inertial Waterra™ foot valves and dedicated tubing. In general, development was achieved through the removal of five times the volume of standing water in the well to achieve purged groundwater free of sediment and with stable field parameters (i.e., pH, conductivity, temperature, and turbidity) or until the well was purged dry.

Prior to groundwater sampling, each monitoring well was purged, which consisted of the removal of sufficient well volumes to allow for the stabilization of field parameters including conductivity, dissolved oxygen (DO), oxygen reduction potential (ORP), pH, temperature, and turbidity. Well stabilization parameters are summarized in Table 2. Groundwater samples were collected from monitoring wells MW4-18 through MW7-18 on May 11, 2018 using low flow sampling techniques to document groundwater quality at and near the Site. Groundwater samples were collected using low flow sampling techniques to reduce the volatilization of VOCs during sample collection and to minimize suspended solids being introduced into groundwater samples. A peristaltic pump or a pre-cleaned stainless steel bladder pump equipped with a Teflon™ bladder was utilized for low flow sampling. Groundwater samples were placed directly into pre-cleaned laboratory supplied sample containers, with required preservative, as appropriate. Groundwater samples collected for metals analyses were field filtered using dedicated 0.45-micron, high capacity inline filters. Field duplicate and trip blank samples were also collected and submitted for quality assurance/quality control (QA/QC). A sample key is provided in Table 1.

3. Physical Characteristics of the Site

3.1 Regional Geology

The Site is located in the broad physiographic region known as the Guelph Drumlin Fields[1]. A review of published quaternary geologic mapping for the area of the Site indicates that the overburden consists predominantly of outwash gravel[2]. Beneath the overburden deposits is bedrock consisting of dolostone of the Eramosa Formation[3]. The thickness of the overburden deposits varies due to surficial topographic relief[4].

1 Chapman, L. J., and D. F., Putnam (1984), "The Physiography of Southern Ontario", Ontario Geological Survey.

2 Karrow P. F. 1963. Pleistocene Geology of Guelph Area, Southern Ontario; Ontario Department of Mines. Map 2153. Scale 1:63, 360.

3 "Bedrock Geology of Ontario" [map]. Scale 1:250, 000. OGS Earth Geoscience Data [computer files]. Sudbury, Ontario: Ontario Geological Survey & Ministry of Northern Development and Mines, 2010.

4 Karrow, P. F., Miller R. F., and Farrell L. 1979. Guelph Area, Southern Ontario; Ontario Geological Survey, Preliminary Map P. 2224. Bedrock Topography Series. Scale 1:50,000. Compiled as of May 1978.

3.2 Local Geology

The stratigraphy encountered at the Site at monitoring wells MW4-18 through MW7-18 generally consists of a fill layer (i.e., sand, gravel, and silt) varying in depths, underlain by sand, silty sand or silt, underlain by sand and gravel in some locations, underlain by weathered bedrock. Topsoil/organic fill was also identified at some locations.

The stratigraphy of the Site is further described below.

- Fill: Fill is present across the Site and is most commonly comprised of sand, gravel, and silt. The fill contained varying amounts of brick, wood, glass, and asphalt debris. Fill was encountered at ground surface with varying thickness.
- Gravelly Sand, or Sand: Beneath the fill layer a well graded gravelly sand/sand is present in all locations at the Site other than MW 6-18. The gravelly sand/sand ranges in thickness from 0.31 to 0.89 metres. At MW6-18 the fill layer extends to weathered bedrock.
- Weathered Bedrock: Weathered dolostone bedrock was encountered at all locations at the Site, with the exception of MW4-18. The overburden/bedrock interface ranged in depth from 2.36 to 3.81 m bgs, ranging in elevation from 303.20 to 303.90 metres above mean sea level (m AMSL).

3.3 Hydrology

There are no surface water bodies at the Site. Storm water generated on the Site either infiltrates the ground surface or flows overland towards catch basins or towards the Site boundaries. The catch basins ultimately discharge to the Speed River south of the Site. The closest water body to the Site is Howitt Creek located just west of the Site. The Speed River is located approximately 80 metres south of the Site.

3.4 Hydrogeology

Prior to collection of groundwater samples, groundwater elevations were collected to determine groundwater elevations, evaluate the direction of groundwater flow at the Site, and confirm the presence or absence of non-aqueous phase liquid (NAPL). Groundwater level measurements were collected from monitoring wells at or near the Site on June 1, 2018. A summary of the recorded groundwater level measurements is presented in Table 3. NAPL was not detected in any of the gauged monitoring wells.

Groundwater levels measured ranged from 303.464 to 304.41 m AMSL in on- and off-Site monitoring wells. The groundwater flow direction is interpreted to be to the south. An illustration of groundwater elevation contours on June 1, 2018 is provided on Figure 3.

4. Analytical Data

4.1 General

Eight soil and seven groundwater samples were submitted to ALS for chemical analyses of select parameters as detailed in the field sample key (Table 1). The laboratory certificates of analysis are provided in Appendix C.

4.2 Assessment Criteria

To assess the soil and groundwater analytical results, GHD referenced 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 (hereinafter referred at as the MECP Standards).

The MECP Standards provide generic soil and groundwater quality standards for certain chemicals, based on combinations of the following Site-specific conditions:

- *Environmental sensitivity* – GHD reviewed the Ministry of Natural Resources and Forestry's – "Natural Heritage Information Centre" database to identify areas registered as Areas of Natural or Scientific Interest (ANSI) within 1 kilometre radius of the Site. The Site and surrounding area do not include an area of natural significance or a provincially significant wetland within 1 kilometre radius of the Site. As such, the Site is not considered environmentally sensitive.
- *Shallow soil property or water body* – Greater than 2 metres of overburden soil exists across the Site, therefore the Site is not considered a shallow soil property. The Site is not located within 30 metres of a water body (Speed River), however off-Site monitoring well MW1-16 is located within 30 meters of the Speed River.
- Depth to groundwater – Groundwater at the Site at some locations is less than 3 metres bgs. As such, the Site is considered to have shallow groundwater conditions.
- *Property use* – The current property use for the Site is municipal/parkland.
- *Restoration of groundwater quality* –The City of Guelph obtains its water supply from groundwater. Therefore, a potable groundwater condition applies to the Site.
- *Restoration depth* – For comparative purposes, results were assessed with respect to shallow soil standards.
- Soil texture – Based on results of the soil grain size analyses completed by GHD as part of the Phase II ESA, the predominant soil texture at the Site is coarse grained. The results of the grain size analysis are provided in Table 4.

Based on the above, all soil and groundwater data has been compared to the generic Site Conditions Standards for Shallow Soils in a Potable Ground Water Condition for residential/parkland/institutional property use (Table 6 Standards).

The Site is not located within 30 metres of a water body (Speed River), however off-Site monitoring well MW1-16 is located within 30 meters of the Speed River. As such, the data for MW1-16 has been compared to the Table 6 Standards as well as the generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition for residential/parkland/institutional property use (Table 8 Standards).

In order to assess the potential for unacceptable exposure to soil and/or groundwater impacts, GHD also referenced MECP's component values incorporated into MECP's Table 6 and 8 Standards. A component value is developed to provide a receptor or group of receptors protection from a contaminant via a specific pathway. The lowest value of all the components that are relevant to a specific land use, potability, or depth class is then used to develop the Standards.

4.3 Quality Assurance/Quality Control

A QA/QC program was implemented during the sampling program to ensure quality data were generated.

Samples were collected in laboratory supplied sample containers with required preservative (if appropriate) and submitted under COC protocol to a Canadian Association of Laboratory Accreditation (CALA) accredited analytical laboratory for chemical analysis. From the time of collection to the time of submission to the laboratory, samples were stored in a cooler and packed on ice to maintain sample integrity.

The following additional measures were taken for quality assurance:

- Between collection of each sample, GHD field personnel donned a new pair of disposal nitrile gloves.
- Prior to use and between each borehole location, non-dedicated in-hole drilling and sampling equipment was thoroughly decontaminated using Alconox® soap and water rinse.
- Groundwater samples were collected using dedicated tubing.
- Groundwater samples collected for metals analysis were field filtered using a dedicated 0.45 micron inline filter.
- One field duplicate groundwater sample for every ten samples was collected and submitted for analysis per parameter.
- A trip blank accompanied sample containers and was submitted for analysis during the groundwater investigation as VOCs were being assessed.

4.4 Soil Quality

Eight soil samples, collected from boreholes advanced at or near the Site, were submitted to ALS for analyses. These soil samples were selectively analyzed as described in the field sample key (Table 1).

The analytical laboratory data generated from the soil quality investigation are summarized in Table 4 (Metals and General Chemistry), Table 5 (PHCs and VOCs), Table 6 (SVOCs) and Table 7 (PCBs), along with MECP Table 6 and 8 Standards for comparative reference. Soil analytical results for parameters that exceed the standard at one or more location are also presented on Figure 4 (Metals and General Chemistry) and Figure 5 (SVOCs). Given that the Site is not used for residential purposes, the use of Table 6 and Table 8 Standards is overly conservative for the current land use (i.e., greenspace neighboring apartment buildings and City roadway). The component values (e.g., direct contact with soil, vapour intrusion, etc.) used in the development of the Table 6 and Table 8 Standards were also used to determine if there was any potential risk to either the human or ecological receptors that might be present at the sites.

Review of Table 4 indicates that inorganic parameters, where detected, were not detected above the relevant MECP Standards, with the exception of conductivity and SAR at MW4-18 (1.2 to 1.8 m bgs), conductivity, cadmium, mercury, zinc and SAR at MW5-18 (1.8 to 2.4 m bgs), conductivity at MW6-18 (2.4 to 3.0 m bgs) and cadmium, mercury and zinc at MW7-18 (1.2 to 1.8 m bgs).

The source of the elevated inorganic parameter concentrations in soil is not known. The concentrations of metals and general chemistry parameters have the potential to represent an unacceptable risk to ecological receptors (cadmium, conductivity, SAR, and zinc) and to humans as a result of direct contact (cadmium) and vapour inhalation (mercury only) pathways. As the majority of the impacts were detected at or below 1 m bgs, there would be limited or no direct contact with these soils by human or ecological receptors. The presence of grass cover will also further reduce direct contact by humans with the underlying soils. As there are no buildings on-Site, there is no current mercury soil vapour intrusion risk.

Review of Table 5 indicates that VOC parameters and PHC fractions were either not detected above the laboratory reporting limit or, where detected, were not detected above the relevant MECP Standards.

Review of Table 6 indicates that SVOCs were either not detected above the laboratory reporting limit, or where detected, were not detected above the relevant MECP Standards, with the exception of some polycyclic aromatic hydrocarbons (PAHs) detected at MW4-18 (1.2 to 1.8 m bgs), MW5-18 (0.6 to 1.2 m bgs and 1.8 to 2.4 m bgs), MW6-18 (2.4 to 3.0 m bgs), and MW7-18 (1.2 to 1.8 m bgs).

The source of the elevated PAH concentrations in soil is not known. Major sources of PAHs to Canadian soil include creosote-treated products (e.g., rail ties and utility poles), spills of petroleum products, metallurgical and coking plants and deposition of atmospheric PAHs[5]. The concentrations of PAHs have the potential to represent an unacceptable risk to ecological receptors and to humans through direct soil contact and vapour inhalation exposure pathways. However, based on the depth of the detected exceedances, the fact there are no buildings on-Site and the presence of grass cover, the PAH impacts are not anticipated to pose a current unacceptable risk to the human and ecological receptors that maybe present at the Site.

Review of Table 7 indicates that PCBs were either not detected above the laboratory reporting limit, or where detected, were not detected above the relevant MECP Standard.

Constituents detected in soil above relevant MECP Standards were not detected in groundwater above relevant MECP Standards (Section 4.5). As such, the soil impacts do not represent a significant source of groundwater impairment.

4.5 Groundwater Quality

Groundwater samples were collected from six monitoring wells on or near the Site. The samples were analyzed for the parameters described in the field sample key (Table 1).

The analytical laboratory data generated from the groundwater quality investigation have been summarized in Table 8 (Metals and General Chemistry), Table 9 (PHCs and VOCs) and Table 10 (SVOCs), along with the MECP Table 6 and Table 8 Standards for comparative reference. Groundwater analytical results for parameters that exceed the Standards at one or more location are also presented on Figure 6.

Review of Tables 8 through 10 indicates that all analyzed parameters were either not detected above the laboratory reporting limit or, where detected, were detected below the MECP Standards,

[5] https://www.canada.ca/en/environment-climate-change/services/management-toxic-substances/list-canadian-environmental-protection-act/polycyclic-aromatic-hydrocarbons.html

as applicable, with the exception of cobalt (MW5-18), sodium (MW4-18), chloride (MW4-18 and MW6-18), and trichloroethene (MW1-16).

Sodium and chloride impacts are most likely attributable to de-icing of City roadways and walkways and not the former buried drum site. Further, cobalt was detected above the MECP potable groundwater component value at MW5-18, upgradient of the former buried drum site and appears to be localized. Given cobalt was detected in groundwater upgradient of the former buried drum site and that cobalt was not detected in soil above the MECP Standard for residential land use, the elevated cobalt groundwater concentration detected at MW5-18 does not appear to be attributable to the former buried drum site.

Trichloroethene was detected at one monitoring well (MW1-16), approximately 80 metres downgradient of the former buried drum site. The concentration of trichloroethene has the potential to pose an unacceptable risk due to groundwater volatilization to residential indoor air. However, there are no nearby occupied structures and as such, the trichlorethene detected in the groundwater at MW1-16 does not pose a current unacceptable vapour inhalation risk. Given trichloroethene is not detected in soil and/or groundwater in close proximity to the buried drum site, the elevated trichloroethene groundwater concentration detected at MW1-16 does not appear to be attributable to the former buried drum site.

Review of groundwater data from monitoring well MW1-16 adjacent to the Speed River indicates that all concentrations are below the component values protective of the groundwater discharging to an aquatic environment. As such, groundwater does not represent an unacceptable risk to aquatic receptors.

5. Conclusions

Based on the Phase II ESA field activities and all field and laboratory analytical data generated therefrom, the following conclusions are provided:

- The source of the elevated inorganic parameter concentrations in soil is not known. The concentrations of metals and general chemistry parameters have the potential to represent an unacceptable risk to ecological receptors (cadmium, conductivity, SAR, and zinc) and to humans as a result of direct contact (cadmium) and vapour inhalation (mercury only) pathways. As the majority of the impacts were detected at or below 1 m bgs, there would be limited or no direct contact with these soils by human or ecological receptors. The presence of grass cover will also further reduce direct contact by humans with the underlying soils. As there are no buildings on-Site, there is no current mercury soil vapour intrusion risk.
- Constituents detected in soil above relevant MECP Standards were not detected in groundwater above relevant MECP Standards. As such, the soil impacts do not represent a significant source of groundwater impairment.
- Sodium and chloride impacts are most likely attributable to de-icing of City roadways and walkways and not the former buried drum site. Further, cobalt was detected above the MECP potable groundwater component value at MW5-18, upgradient of the former buried drum site and appears to be localized. Given cobalt was detected in groundwater upgradient of the former buried drum site and that cobalt was not detected in soil above the MECP Standard for

residential land use, the elevated cobalt groundwater concentration detected at MW5-18 does not appear to be attributable to the former buried drum site.

- Trichloroethene was detected at one monitoring well (MW1-16), approximately 80 metres downgradient of the former buried drum site. The concentration of trichloroethene has the potential to pose an unacceptable risk due to groundwater volatilization to residential indoor air. However, there are no nearby occupied structures and as such, the trichlorethene detected in the groundwater at MW1-16 does not pose a current unacceptable vapour inhalation risk. Given trichloroethene is not detected in soil and/or groundwater in close proximity to the buried drum site, the elevated trichloroethene groundwater concentration detected at MW1-16 does not appear to be attributable to the former buried drum site.
- Review of groundwater data from monitoring well MW1-16 adjacent to the Speed River indicates that all concentrations are below the component values protective of the groundwater discharging to an aquatic environment. As such, groundwater does not represent an unacceptable risk to aquatic receptors.

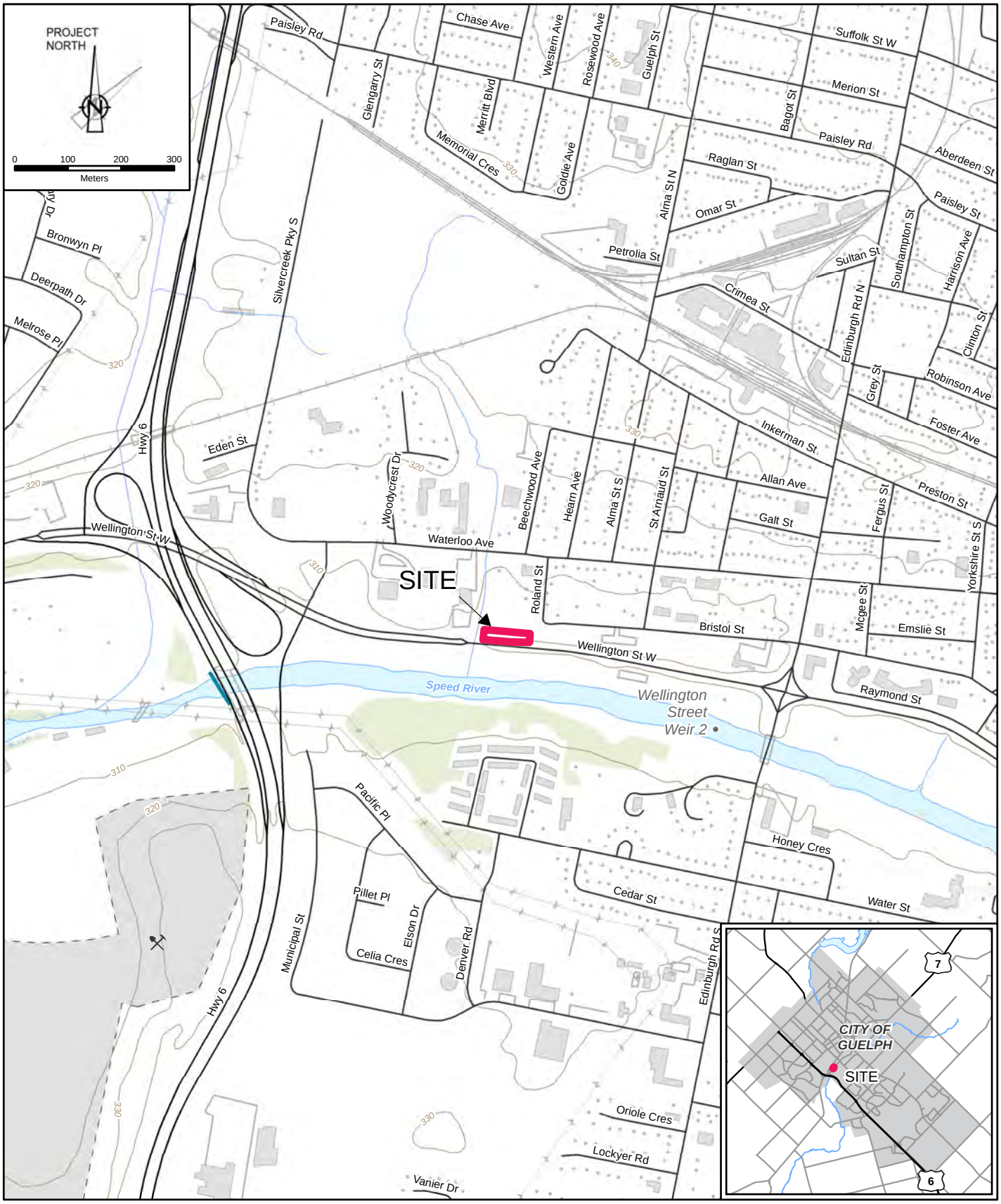
All of Which is Respectfully Submitted,

GHD

Robert Catallo, P. Eng.

Shannon Richardson, P. Eng.

Figures



Source: MNRF NRVIS, 2018. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018.
Coordinate System: NAD 1983 UTM Zone 17N

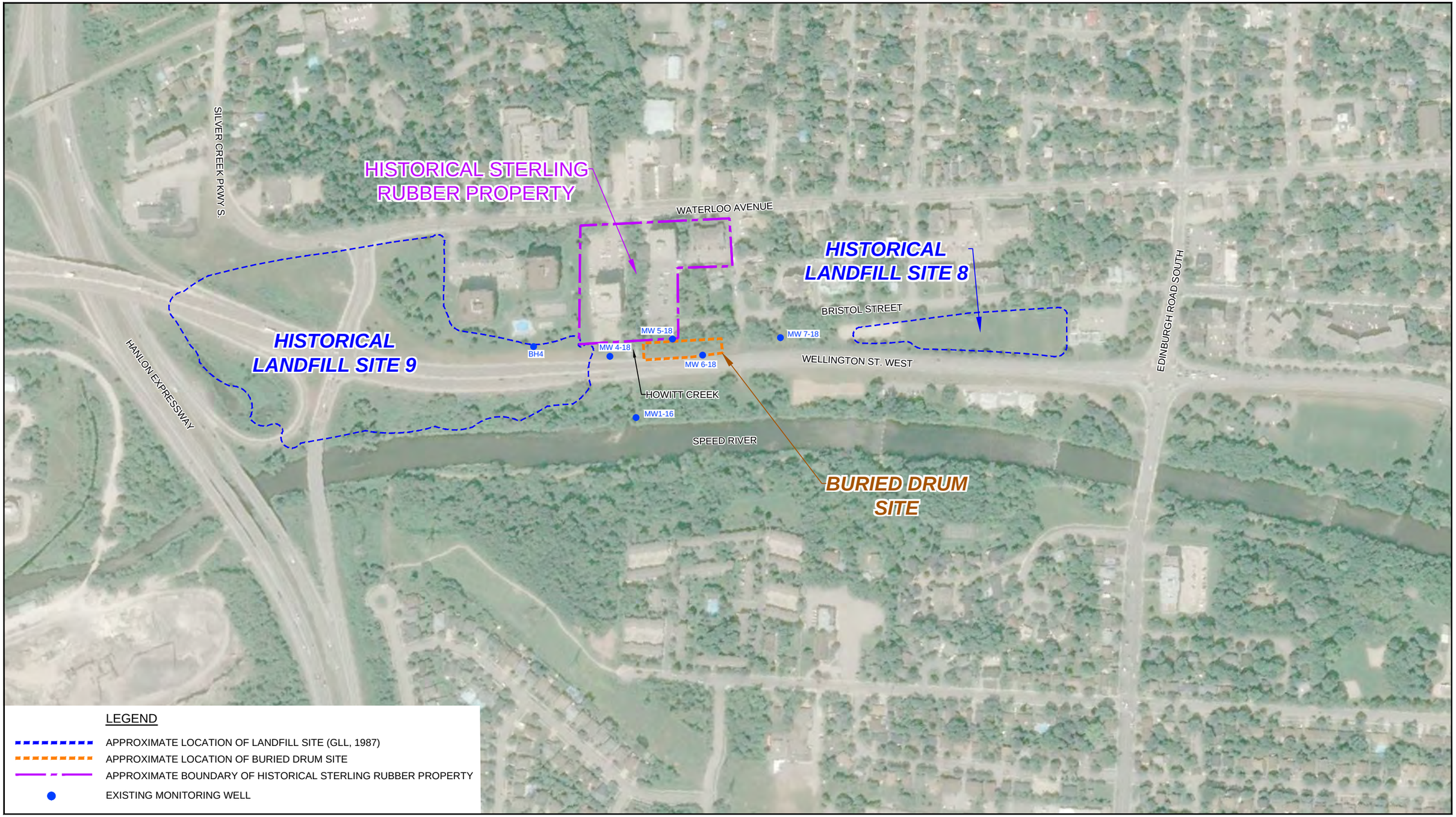
THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST BURIED DRUM SITE
GUELPH, ONTARIO
PHASE II ENVIRONMENTAL SITE ASSESSMENT

11149990
Jul 5, 2018

SITE LOCATION MAP

FIGURE 1

GIS File: Q:\GIS\PROJECTS\11149000s\11149990\Layouts\005\11149990-00(005)GIS-WA001.mxd



Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date [unknown], Accessed: 2017

0 40 80 120m

PROJECT NORTH

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST BURIED DRUM SITE, GUELPH, ONTARIO
PHASE II ENVIRONMENTAL SITE ASSESSMENT

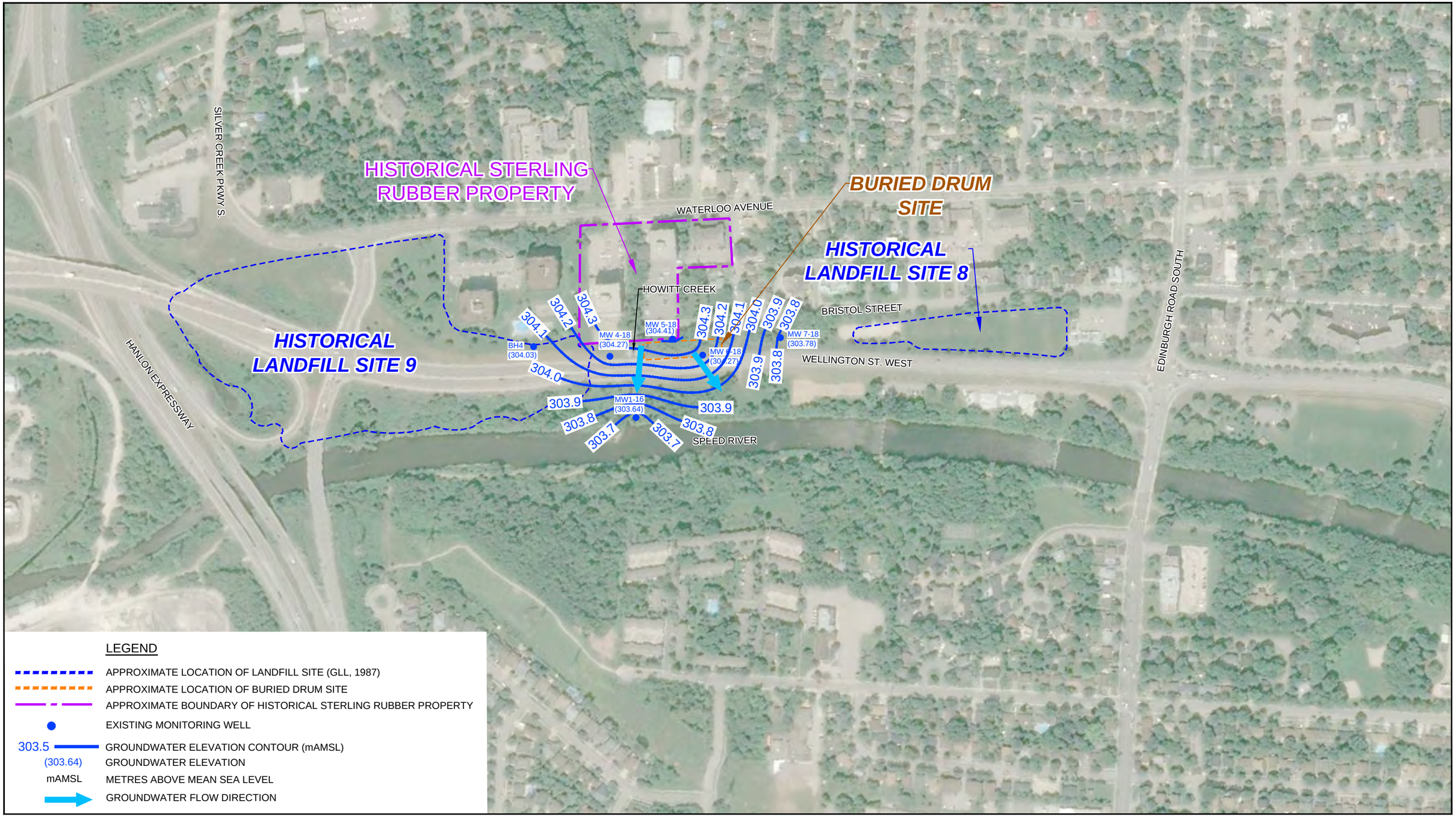
SITE PLAN

11149990-00

Jul 4, 2018

FIGURE 2

CAD File: I:\DRAWINGS\11140000s\11149000s\11149990\11149990-REPORT\11149990-00(005)\11149990-00(005)GN\11149990-00(005)GN-SC001.DWG



Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date [unknown], Accessed: 2017

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PROJECT NORTH

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST BURIED DRUM SITE, GUELPH, ONTARIO
PHASE II ENVIRONMENTAL SITE ASSESSMENT

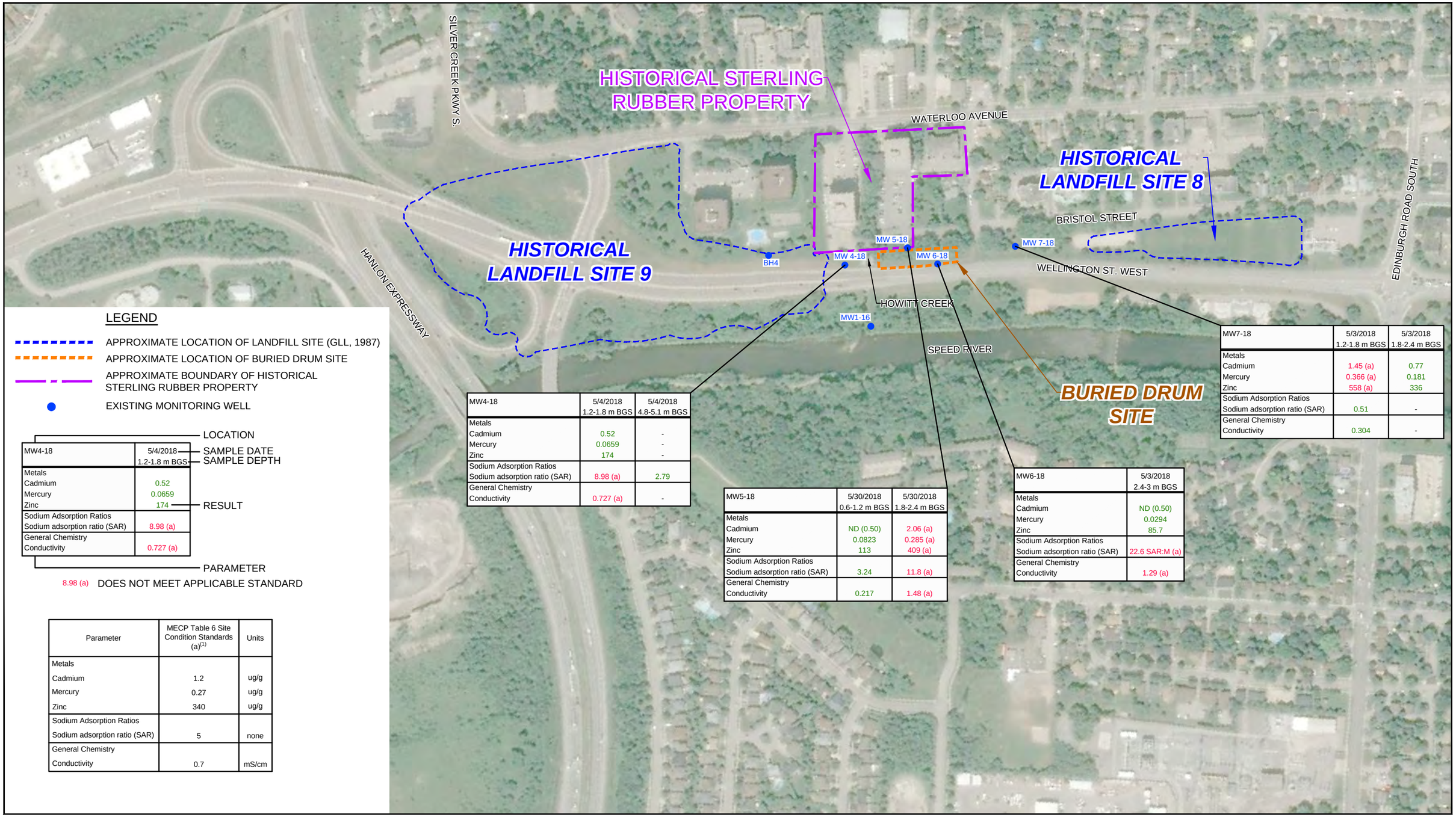
11149990-00

Jul 5, 2018

GROUNDWATER CONTOUR ELEVATIONS (JUNE 1, 2018)

FIGURE 3

CAD File: T:\DRAWINGS\11140000s\11149000s\11149990\11149990-REPORT\11149990-00(005)\11149990-00(005)GN\11149990-00(005)GN-SC002.DWG



LEGEND

- APPROXIMATE LOCATION OF LANDFILL SITE (GLL, 1987)
- APPROXIMATE LOCATION OF BURIED DRUM SITE
- APPROXIMATE BOUNDARY OF HISTORICAL STERLING RUBBER PROPERTY
- EXISTING MONITORING WELL

MW4-18	5/4/2018 1.2-1.8 m BGS
Metals	
Cadmium	0.52
Mercury	0.0659
Zinc	174
Sodium Adsorption Ratios	
Sodium adsorption ratio (SAR)	8.98 (a)
General Chemistry	
Conductivity	0.727 (a)

LOCATION
SAMPLE DATE
SAMPLE DEPTH
RESULT
PARAMETER

8.98 (a) DOES NOT MEET APPLICABLE STANDARD

Parameter	MECP Table 6 Site Condition Standards (a)[1]	Units
Metals		
Cadmium	1.2	ug/g
Mercury	0.27	ug/g
Zinc	340	ug/g
Sodium Adsorption Ratios		
Sodium adsorption ratio (SAR)	5	none
General Chemistry		
Conductivity	0.7	mS/cm

MW4-18	5/4/2018 1.2-1.8 m BGS	5/4/2018 4.8-5.1 m BGS
Metals		
Cadmium	0.52	-
Mercury	0.0659	-
Zinc	174	-
Sodium Adsorption Ratios		
Sodium adsorption ratio (SAR)	8.98 (a)	2.79
General Chemistry		
Conductivity	0.727 (a)	-

MW5-18	5/30/2018 0.6-1.2 m BGS	5/30/2018 1.8-2.4 m BGS
Metals		
Cadmium	ND (0.50)	2.06 (a)
Mercury	0.0823	0.285 (a)
Zinc	113	409 (a)
Sodium Adsorption Ratios		
Sodium adsorption ratio (SAR)	3.24	11.8 (a)
General Chemistry		
Conductivity	0.217	1.48 (a)

MW6-18	5/3/2018 2.4-3 m BGS
Metals	
Cadmium	ND (0.50)
Mercury	0.0294
Zinc	85.7
Sodium Adsorption Ratios	
Sodium adsorption ratio (SAR)	22.6 SAR:M (a)
General Chemistry	
Conductivity	1.29 (a)

MW7-18	5/3/2018 1.2-1.8 m BGS	5/3/2018 1.8-2.4 m BGS
Metals		
Cadmium	1.45 (a)	0.77
Mercury	0.366 (a)	0.181
Zinc	558 (a)	336
Sodium Adsorption Ratios		
Sodium adsorption ratio (SAR)	0.51	-
General Chemistry		
Conductivity	0.304	-

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0 40 80 120m

PROJECT NORTH

NOTE:

(1) Coarse Grained Soils

SAR:M - Reported SAR represents a maximum value. Actual SAR may be lower if both Ca and Mg were detectable.

GHD

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST BURIED DRUM SITE, GUELPH, ONTARIO
PHASE II ENVIRONMENTAL SITE ASSESSMENT

SOIL ANALYTICAL RESULTS METALS AND GENERAL CHEMISTRY

11149990-00

Aug 10, 2018

FIGURE 4

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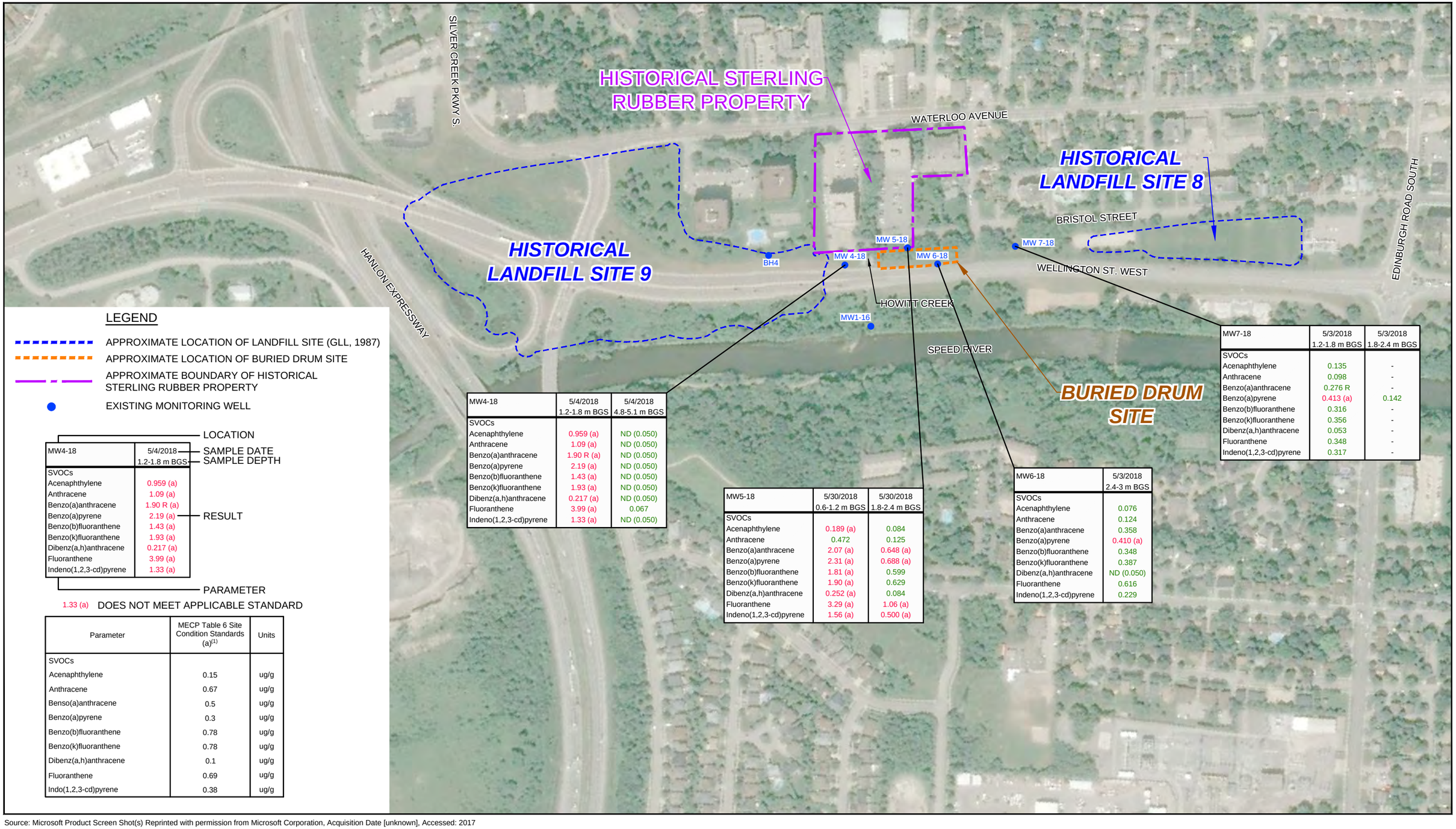

LEGEND

- APPROXIMATE LOCATION OF LANDFILL SITE (GLL, 1987)
- APPROXIMATE LOCATION OF BURIED DRUM SITE
- APPROXIMATE BOUNDARY OF HISTORICAL STERLING RUBBER PROPERTY
- EXISTING MONITORING WELL

MW4-18	5/4/2018 1.2-1.8 m BGS
SVOCs	
Acenaphthylene	0.959 (a)
Anthracene	1.09 (a)
Benzo(a)anthracene	1.90 R (a)
Benzo(a)pyrene	2.19 (a)
Benzo(b)fluoranthene	1.43 (a)
Benzo(k)fluoranthene	1.93 (a)
Dibenz(a,h)anthracene	0.217 (a)
Fluoranthene	3.99 (a)
Indeno(1,2,3-cd)pyrene	1.33 (a)

LOCATION; SAMPLE DATE; SAMPLE DEPTH; RESULT; PARAMETER

1.33 (a) DOES NOT MEET APPLICABLE STANDARD

Parameter	MECP Table 6 Site Condition Standards (a)(1)	Units
SVOCs		
Acenaphthylene	0.15	ug/g
Anthracene	0.67	ug/g
Benso(a)anthracene	0.5	ug/g
Benzo(a)pyrene	0.3	ug/g
Benzo(b)fluoranthene	0.78	ug/g
Benzo(k)fluoranthene	0.78	ug/g
Dibenz(a,h)anthracene	0.1	ug/g
Fluoranthene	0.69	ug/g
Indo(1,2,3-cd)pyrene	0.38	ug/g

MW4-18	5/4/2018 1.2-1.8 m BGS	5/4/2018 4.8-5.1 m BGS
SVOCs		
Acenaphthylene	0.959 (a)	ND (0.050)
Anthracene	1.09 (a)	ND (0.050)
Benzo(a)anthracene	1.90 R (a)	ND (0.050)
Benzo(a)pyrene	2.19 (a)	ND (0.050)
Benzo(b)fluoranthene	1.43 (a)	ND (0.050)
Benzo(k)fluoranthene	1.93 (a)	ND (0.050)
Dibenz(a,h)anthracene	0.217 (a)	ND (0.050)
Fluoranthene	3.99 (a)	0.067
Indeno(1,2,3-cd)pyrene	1.33 (a)	ND (0.050)

MW5-18	5/30/2018 0.6-1.2 m BGS	5/30/2018 1.8-2.4 m BGS
SVOCs		
Acenaphthylene	0.189 (a)	0.084
Anthracene	0.472	0.125
Benzo(a)anthracene	2.07 (a)	0.648 (a)
Benzo(a)pyrene	2.31 (a)	0.688 (a)
Benzo(b)fluoranthene	1.81 (a)	0.599
Benzo(k)fluoranthene	1.90 (a)	0.629
Dibenz(a,h)anthracene	0.252 (a)	0.084
Fluoranthene	3.29 (a)	1.06 (a)
Indeno(1,2,3-cd)pyrene	1.56 (a)	0.500 (a)

MW6-18	5/3/2018 2.4-3 m BGS
SVOCs	
Acenaphthylene	0.076
Anthracene	0.124
Benzo(a)anthracene	0.358
Benzo(a)pyrene	0.410 (a)
Benzo(b)fluoranthene	0.348
Benzo(k)fluoranthene	0.387
Dibenz(a,h)anthracene	ND (0.050)
Fluoranthene	0.616
Indeno(1,2,3-cd)pyrene	0.229

MW7-18	5/3/2018 1.2-1.8 m BGS	5/3/2018 1.8-2.4 m BGS
SVOCs		
Acenaphthylene	0.135	-
Anthracene	0.098	-
Benzo(a)anthracene	0.276 R	-
Benzo(a)pyrene	0.413 (a)	0.142
Benzo(b)fluoranthene	0.316	-
Benzo(k)fluoranthene	0.356	-
Dibenz(a,h)anthracene	0.053	-
Fluoranthene	0.348	-
Indeno(1,2,3-cd)pyrene	0.317	-

0 40 80 120m

PROJECT NORTH

NOTE:

(1) Coarse Grained Soils

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THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST BURIED DRUM SITE, GUELPH, ONTARIO
PHASE II ENVIRONMENTAL SITE ASSESSMENT

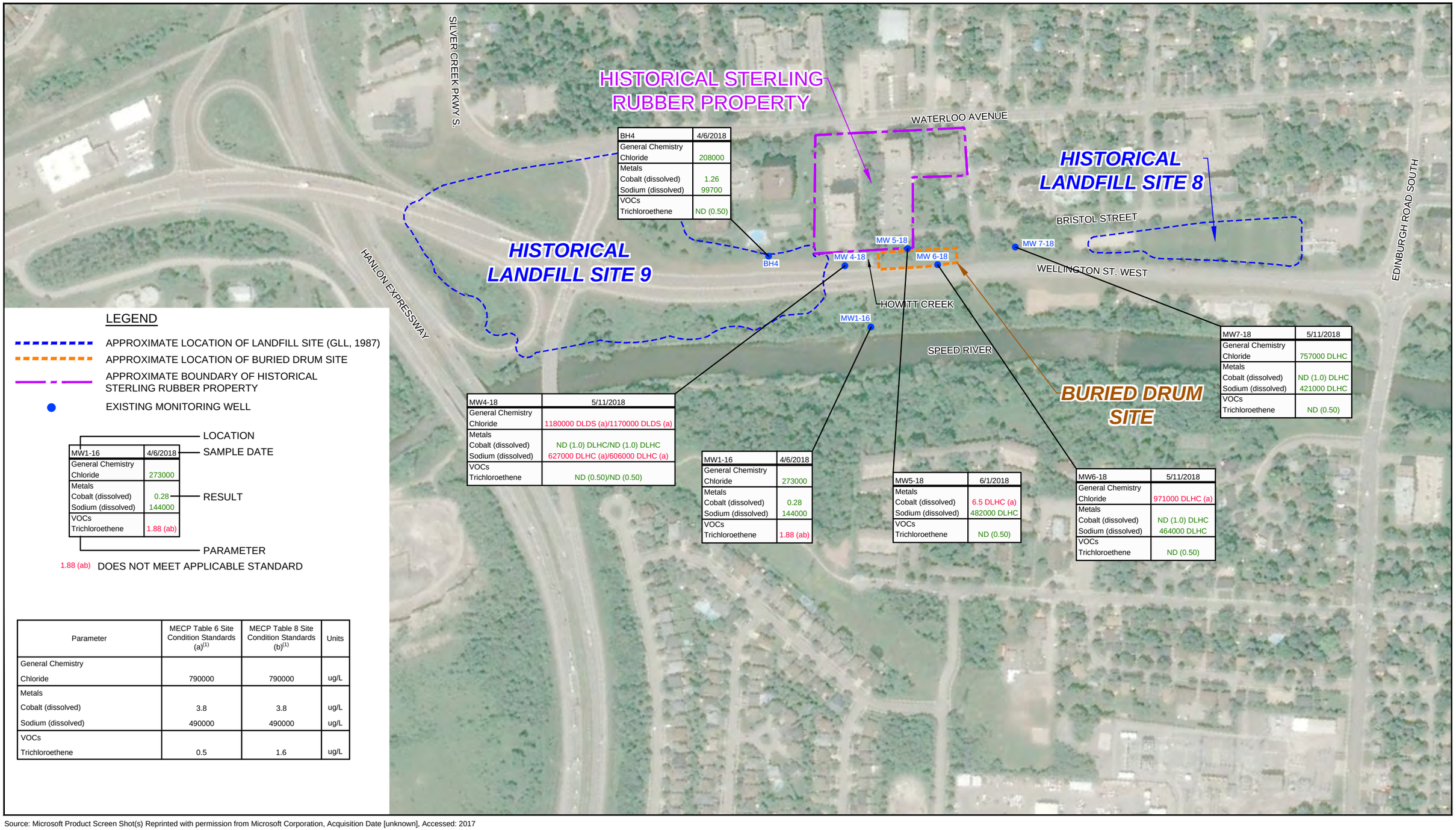
SOIL ANALYTICAL RESULTS - SVOCs

11149990-00

Aug 10, 2018

FIGURE 5

CAD File: I:\DRAWINGS\11140000s\11149000s\11149990\11149990-REPORT\11149990-00(005)\11149990-00(005)GN\11149990-00(005)GN-SC004.DWG



BH4	4/6/2018
General Chemistry	
Chloride	208000
Metals	
Cobalt (dissolved)	1.26
Sodium (dissolved)	99700
VOCs	
Trichloroethene	ND (0.50)

MW4-18	5/11/2018
General Chemistry	
Chloride	1180000 DLDS (a)/1170000 DLDS (a)
Metals	
Cobalt (dissolved)	ND (1.0) DLHC/ND (1.0) DLHC
Sodium (dissolved)	627000 DLHC (a)/606000 DLHC (a)
VOCs	
Trichloroethene	ND (0.50)/ND (0.50)

MW1-16	4/6/2018
General Chemistry	
Chloride	273000
Metals	
Cobalt (dissolved)	0.28
Sodium (dissolved)	144000
VOCs	
Trichloroethene	1.88 (ab)

MW5-18	6/1/2018
Metals	
Cobalt (dissolved)	6.5 DLHC (a)
Sodium (dissolved)	482000 DLHC
VOCs	
Trichloroethene	ND (0.50)

MW6-18	5/11/2018
General Chemistry	
Chloride	971000 DLHC (a)
Metals	
Cobalt (dissolved)	ND (1.0) DLHC
Sodium (dissolved)	464000 DLHC
VOCs	
Trichloroethene	ND (0.50)

MW7-18	5/11/2018
General Chemistry	
Chloride	757000 DLHC
Metals	
Cobalt (dissolved)	ND (1.0) DLHC
Sodium (dissolved)	421000 DLHC
VOCs	
Trichloroethene	ND (0.50)

LEGEND

- APPROXIMATE LOCATION OF LANDFILL SITE (GLL, 1987)
- APPROXIMATE LOCATION OF BURIED DRUM SITE
- APPROXIMATE BOUNDARY OF HISTORICAL STERLING RUBBER PROPERTY
- EXISTING MONITORING WELL

MW1-16	4/6/2018
General Chemistry	
Chloride	273000
Metals	
Cobalt (dissolved)	0.28
Sodium (dissolved)	144000
VOCs	
Trichloroethene	1.88 (ab)

LOCATION
SAMPLE DATE
RESULT
PARAMETER

1.88 (ab) DOES NOT MEET APPLICABLE STANDARD

Parameter	MECP Table 6 Site Condition Standards (a)[1]	MECP Table 8 Site Condition Standards (b)[1]	Units
General Chemistry			
Chloride	790000	790000	ug/L
Metals			
Cobalt (dissolved)	3.8	3.8	ug/L
Sodium (dissolved)	490000	490000	ug/L
VOCs			
Trichloroethene	0.5	1.6	ug/L

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date [unknown], Accessed: 2017

0 40 80 120m

PROJECT NORTH

NOTE:

(1) Coarse Grained Soils
(2) BH4, MW4-18, MW5-18, MW6-18, AND MW7-18 SCREENED AGAINST MECP TABLE 6
(3) MW1-16 SCREENED AGAINST MECP TABLE 6 AND MECP TABLE 8

DLDS - Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC - Detection limit raised: Dilution required due to high concentration of test analyte(s).

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST BURIED DRUM SITE, GUELPH, ONTARIO
PHASE II ENVIRONMENTAL SITE ASSESSMENT

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GROUNDWATER ANALYTICAL RESULTS

FIGURE 6

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Tables

Table 1

Field Sample Key
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location	*Depth (m)*	*Sample Identification*	*Sample Date*	*Sample Time*	*Matrix*	*Sample Type*	*Parent Sample*	*VOCs, PHC F1-F4*	*SVOCs*	*Metals and Inorganics*	*VOC,F1 (Trip Blank)*	*PCBs*	*pH*	*Grainsize*
MW4-18	1.2-1.8	S-11149990-050418-TW-11	05/04/18	8:15	SO	N	-	X	X	X		X		
MW4-18	4.8-5.1	S-11149990-050418-TW-12	05/04/18	8:30	SO	N	-		X	X				
MW4-18	0.6-1.2	S-11149990-050418-TW-21	05/04/18	8:10	SO	N	-						X	X
MW5-18	0.6-1.2	S-11149990-053018-TW-24	05/30/18	14:00	SO	N	-	X	X	X		X		
MW5-18	1.8-2.4	S-11149990-053018-TW-25	05/30/18	14:15	SO	N	-	X	X	X		X		
MW6-18	2.4-3.0	S-11149990-050318-TW-10	05/03/18	14:15	SO	N	-	X	X	X		X		
MW7-18	1.2-1.8	S-11149990-050318-TW-08	05/03/18	8:30	SO	N	-	X	X	X		X		
MW7-18	1.8-2.4	S-11149990-050318-TW-09	05/03/18	8:40	SO	N	-		X	X				
Trip Blank	n/a	TB-11149990-050118-TW-01	05/01/18	-	SO	TB	-				X			
Trip Blank	n/a	TB-11149990-053018-TW-02	05/30/18	-	SO	TB	-				X			
MW1-16	n/a	GW-11149990-040618-008	04/06/18	12:40	WG	N	-	X	X	X				
BH4	n/a	GW-11149990-040618-009	04/06/18	13:50	WG	N	-	X	X	X				
MW4-18	n/a	GW-11149990-051118-TW-005	05/11/18	12:50	WG	N	-	X	X	X				
MW4-18	n/a	GW-11149990-051118-TW-006	05/11/18	12:50	WG	FD	GW-11149990-051118-TW-005	X	X	X				
MW5-18	n/a	GW-11149990-060118-TW-002	06/01/18	13:10	WG	N	-	X	X	X				
MW6-18	n/a	GW-11149990-051118-TW-003	05/11/18	15:20	WG	N	-	X	X	X				
MW7-18	n/a	GW-11149990-051118-TW-001	05/11/18	10:00	WG	N	-	X	X	X				
Trip Blank	n/a	TB-11149990-040518-001	04/05/18	--	WG	TB	-				X			
Trip Blank	n/a	TB-11149990-051118-TW-001	05/11/18	-	WG	TB	-				X			
Trip Blank	n/a	TB-11149990-060118-TW-002	06/01/18	-	WG	TB	-				X			

Notes:
FD - Field Duplicate
N - Normal
PCBs - Polychlorinated Biphenyls
PHCs - Petroleum Hydrocarbons
SO- Soil
SVOCs - Semi-Volatile Organic Compounds
TB - Trip Blank
VOCs - Volatile Organic Compounds
WG - Groundwater
X - Sample analyzed for the noted parameters

Table 2

Well Stabilization Parameters
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Location	*Date*	*Depth to Water (m btor)*	*Well Volume (litres)*	*Time (24 hour)*	*Purge Rate (mL/min)*	*Volume Purged (litres)*	*Temperature (^{O}C)*	*Conductivity (mS/cm)*	*Turbidity (NTU)*	*pH (s.u.)*	*ORP (mV)*
BH4	4/6/2018	5.23	1.32	13:15	-	-	-	-	-	-	-
		5.43	0.91	13:25	80	0.8	5.55	1.36	109.0	7.04	-106
		5.47	0.83	13:30	80	1.2	5.94	1.35	103.0	7.04	-98
		5.48	0.81	13:35	80	1.6	6.1	1.33	47.4	7.04	-101
		5.51	0.75	13:40	80	2.0	6.73	1.33	31.2	7.05	-105
		5.52	0.73	13:45	80	2.5	6.43	1.34	32.3	--	-103
MW1-16	4/6/2018	1.99	6.86	12:10	-	-	-	-	-	-	-
		2.05	6.74	12:15	100	0.5	3.58	1.26	0.0	7.28	110
		2.05	6.74	12:20	100	1.0	3.70	1.39	0.0	7.22	88
		2.04	6.76	12:25	100	1.5	3.39	1.42	0.0	7.2	66
		2.05	6.74	12:30	100	2.0	4.24	1.44	0.0	7.21	54
		2.04	6.76	12:35	100	2.5	4.26	1.44	0.0	7.21	53
MW4-18	5/11/2018	1.97	6.17	11:20	-	-	-	-	-	-	-
		1.98	6.15	11:50	200	6.0	10.82	5.140	800.0	7.24	-63
		2.02	6.07	12:00	200	8.0	8.11	5.250	600.0	7.28	-113
		2.03	6.05	12:05	200	9.0	8.07	5.110	427.0	7.28	-114
		2.03	6.05	12:10	200	10.0	7.94	5.000	196.0	7.3	-116
		2.03	6.05	12:15	200	11.0	7.97	4.880	135.0	7.31	-118
		2.03	6.05	12:20	200	12.0	7.98	4.750	101.0	7.32	-120
		2.03	6.05	12:25	200	13.0	7.96	4.690	82.1	7.33	-120
		2.03	6.05	12:30	200	14.0	7.89	4.670	72.1	7.33	-121
		2.03	6.05	12:35	200	15.0	7.89	4.620	61.3	7.33	-121
		2.03	6.05	12:40	200	16.0	7.92	4.560	50.1	7.34	-121
		2.03	6.05	12:45	200	17.0	7.92	4.560	42.8	7.34	-121
MW5-18	6/1/2018	1.70	4.16	11:50	-	-	-	-	-	-	-
		1.72	4.12	12:05	300	4.5	17.05	3.510	>1000	6.77	-86
		1.72	4.12	12:10	300	6.0	14.71	3.450	>1000	6.85	-96
		1.72	4.12	12:15	300	7.5	14.31	3.420	648.0	6.84	-92
		1.72	4.12	12:20	300	9.0	14.01	3.430	485.0	6.85	-91
		1.72	4.12	12:25	300	10.5	14.14	3.400	332.0	6.84	-88
		1.71	4.14	12:30	300	12.0	14.08	3.410	280.0	6.84	-88
		1.72	4.12	12:35	300	13.5	13.99	3.410	225.0	6.84	-86
		1.72	4.12	12:40	300	15.0	13.93	3.410	160.0	6.84	-85
		1.71	4.14	12:45	300	16.5	13.87	3.390	145.0	6.83	-84
		1.72	4.12	12:50	300	18.0	13.99	3.380	127.0	6.83	-84
		1.72	4.12	12:55	300	19.5	13.94	3.380	96.7	6.83	-83
		1.72	4.12	13:00	300	21.0	13.87	3.390	82.7	6.83	-83
		1.72	4.12	13:05	300	22.5	13.75	3.380	81.4	6.83	-83

Table 2

Well Stabilization Parameters
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Location	*Date*	*Depth to Water (m btor)*	*Well Volume (litres)*	*Time (24 hour)*	*Purge Rate (mL/min)*	*Volume Purged (litres)*	*Temperature (^{O}C)*	*Conductivity (mS/cm)*	*Turbidity (NTU)*	*pH (s.u.)*	*ORP (mV)*
MW6-18	5/11/2018	2.12	5.74	14:05	-	-	-	-	-	-	-
		Below Top of Pump	-	14:20	100	1.5	10.10	3.750	521.0	6.90	-49
		Below Top of Pump	-	14:25	100	2.0	9.90	3.780	274.0	6.89	-50
		Below Top of Pump	-	14:30	100	2.5	9.87	3.750	202.0	6.89	-50
		Below Top of Pump	-	14:35	50	2.8	9.78	3.750	134.0	6.89	-50
		Below Top of Pump	-	14:40	50	3.0	10.20	3.760	134.0	6.89	-49
		Below Top of Pump	-	14:45	50	3.3	10.21	3.760	101.0	6.89	-49
		Below Top of Pump	-	14:50	50	3.5	10.74	3.770	80.0	6.89	-48
		Below Top of Pump	-	14:55	50	3.8	11.39	3.770	70.6	6.89	-46
		Below Top of Pump	-	15:00	50	4.0	12.1	3.770	66.1	6.88	-45
		Below Top of Pump	-	15:05	50	4.3	12.73	3.770	55.5	6.87	-44
		Below Top of Pump	-	15:10	50	4.5	12.92	3.760	53.0	6.87	-43
		Below Top of Pump	-	15:15	50	4.8	13.22	3.740	41.3	6.86	-43
MW7-18	5/11/2018	2.03	3.47	8:30	-	-	-	-	-	-	-
		2.03	3.47	8:50	100	2.0	9.02	3.200	300.0	6.84	115
		2.03	3.47	8:55	100	2.5	8.53	3.260	278.0	6.86	102
		2.04	3.45	9:00	100	3.0	8.51	3.280	246.0	6.86	96
		2.04	3.45	9:15	100	4.5	8.58	3.340	130.0	6.88	91
		2.03	3.47	9:20	100	5.0	8.7	3.340	102.0	6.87	90
		2.03	3.47	9:25	100	5.5	8.63	3.360	69.1	6.87	89
		2.03	3.47	9:30	100	6.0	8.75	3.390	49.5	6.86	89
		2.03	3.47	9:35	100	6.5	8.82	3.390	40.5	6.86	88
		2.04	3.45	9:40	100	7.0	8.79	3.410	32.5	6.85	88
		2.03	3.47	9:45	100	7.5	8.85	3.420	24.8	6.85	88
		2.03	3.47	9:50	100	8.0	8.95	3.420	21.8	6.85	87
		2.03	3.47	9:55	100	8.5	8.92	3.450	18.7	6.85	87

Notes:
m btor - metres below top of riser
mS/cm - millisiemens per centimetre
mV - millivolts
NTU - Nephelometric Turbidity Units
ORP - Oxidation Reduction Potential
s.u. - Standard Units
^{o}C - degrees Celsius
mL/min - millilitres per minute

Table 3

Groundwater Elevations
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

			04/04/18			*06/01/18*		
Monitoring Well	***Reference Elevation***	***Ground Elevation***	***Depth to Water***	***Depth to Water***	***Groundwater Elevation***	***Depth to Water***	***Depth to Water***	***Groundwater Elevation***
	(m AMSL)	***(m AMSL)***	***(m btor)***	***(m bgs)***	***(m AMSL)***	***(m btor)***	***(m bgs)***	***(m AMSL)***
BH4	309.25	309.48	5.33	5.55	303.92	5.22	5.44	304.03
MW1-16	305.79	304.92	1.96	1.08	303.83	2.15	1.27	303.64
MW4-18	307.38	307.45	-	-	-	3.11	3.18	304.27
MW5-18	306.11	306.25	-	-	-	1.70	1.84	304.41
MW6-18	307.59	307.71	-	-	-	3.32	3.44	304.27
MW7-18	306.11	306.20	-	-	-	2.33	2.42	303.78

Notes:
m AMSL - metres above mean sea level
m btor - metres below top of riser (i.e., reference elevation)
m bgs - metres below ground surface

Table 4

Soil Analytical Results - Metals and General Chemistry
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:			**MW4-18**	**MW4-18**	**MW4-18**	**MW5-18**	**MW5-18**	**MW6-18**	**MW7-18**	**MW7-18**
Sample ID:			**S-11149990-050418-TW-11**	**S-11149990-050418-TW-12**	**S-11149990-050418-TW-21**	**S-11149990-053018-TW-25**	**S-11149990-053018-TW-24**	**S-11149990-050318-TW-10**	**S-11149990-050318-TW-08**	**S-11149990-050318-TW-09**
Sample Date:			**5/4/2018**	**5/4/2018**	**5/4/2018**	**5/30/2018**	**5/30/2018**	**5/3/2018**	**5/3/2018**	**5/3/2018**
Sample Depth:			**1.2-1.8 m BGS**	**4.8-5.1 m BGS**	**0.6-1.2 m BGS**	**1.8-2.4 m BGS**	**0.6-1.2 m BGS**	**2.4-3 m BGS**	**1.2-1.8 m BGS**	**1.8-2.4 m BGS**
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**								
General Chemistry										
Conductivity	mS/cm	0.7	**0.727[a]**	-	-	**1.48[a]**	0.217	**1.29[a]**	0.304	-
Cyanide, weak acid dissociable	ug/g	nc	ND (0.050)	-	-	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	-
Grain size >75um	%	nc	-	-	57.9	-	-	-	-	-
Moisture	%	nc	9.53	10.5	-	36.7	14.8	14.7	14.9	13.0
pH, lab	s.u.	nc	7.69	-	7.54	7.26	7.56	7.40	7.31	-
Metals										
Antimony	ug/g	7.5	ND (1.0)	-	-	2.2	1.2	ND (1.0)	ND (1.0)	-
Arsenic	ug/g	18	4.1	-	-	10.6	5.3	3.5	5.0	-
Barium	ug/g	390	61.5	-	-	52.7	28.7	43.1	61.7	-
Beryllium	ug/g	4	ND (0.50)	-	-	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	-
Boron	ug/g	120	13.2	-	-	9.6	ND (5.0)	7.8	10.1	-
Cadmium	ug/g	1.2	0.52	-	-	**2.06[a]**	ND (0.50)	ND (0.50)	**1.45[a]**	0.77
Chromium	ug/g	160	13.6	-	-	23.3	9.1	13.7	12.9	-
Chromium VI (hexavalent)	ug/g	8	0.27	-	-	ND (0.20)	0.48	ND (0.20)	ND (0.20)	-
Cobalt	ug/g	22	6.0	-	-	7.6	20.4	4.6	3.8	-
Copper	ug/g	140	25.5	-	-	66.8	53.2	13.4	35.1	-
Lead	ug/g	120	40.7	-	-	85.3	35.4	17.7	52.4	-
Mercury	ug/g	0.27	0.0659	-	-	**0.285[a]**	0.0823	0.0294	**0.366[a]**	0.181
Molybdenum	ug/g	6.9	ND (1.0)	-	-	1.5	1.5	ND (1.0)	1.3	-
Nickel	ug/g	100	11.6	-	-	17.6	10.1	10.2	39.4	-
Selenium	ug/g	2.4	ND (1.0)	-	-	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-
Silver	ug/g	20	ND (0.20)	-	-	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	-
Thallium	ug/g	1	ND (0.50)	-	-	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	-
Uranium	ug/g	23	ND (1.0)	-	-	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-
Vanadium	ug/g	86	20.1	-	-	23.2	13.6	23.9	14.3	-
Zinc	ug/g	340	174	-	-	**409[a]**	113	85.7	**558[a]**	336
Sodium Adsorption Ratios										
Calcium (available)	mg/L	nc	13.0	8.7	-	28.6	5.2	6.9	29.4	-
Magnesium (available)	mg/L	nc	1.7	2.7	-	1.5	2.3	ND (1.0)	2.2	-
Sodium (available)	mg/L	nc	130	36.8	-	240	35.2	216	10.7	-
Sodium adsorption ratio (SAR)	none	5	**8.98[a]**	2.79	-	**11.8[a]**	3.24	22.6 SAR:M	0.51	-

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.
ND - Not present at or above the associated value
- Not analyzed
nc - No criteria
ug/g - micrograms per gram
mg/L - millegrams per liter
BGS- Below ground surface
mS/cm - millesiemens per centimeter
s.u. - standard units
DLHC - Detection limit raised: Dilution required due to high concentration of test analyte(s).
SAR:M - Reported SAR represents a maximum value. Actual SAR may be lower if both Ca and Mg were detectable.

8.98[a] Detected concentration exceeds noted criteria

Table 5

Soil Analytical Results - PHCs and VOCs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:			**MW4-18**	**MW5-18**	**MW5-18**	**MW6-18**	**MW7-18**
Sample ID:			**S-11149990-050418-TW-11**	**S-11149990-053018-TW-25**	**S-11149990-053018-TW-24**	**S-11149990-050318-TW-10**	**S-11149990-050318-TW-08**
Sample Date:			**5/4/2018**	**5/30/2018**	**5/30/2018**	**5/3/2018**	**5/3/2018**
Sample Depth:			**1.2-1.8 m BGS**	**1.8-2.4 m BGS**	**0.6-1.2 m BGS**	**2.4-3 m BGS**	**1.2-1.8 m BGS**
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**					
Petroleum Hydrocarbons							
Chromatogram to baseline at nC50	none	nc	NO	NO	NO	YES	NO
Petroleum hydrocarbons F1 (C6-C10)	ug/g	55	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Petroleum hydrocarbons F1 minus BTEX	ug/g	nc	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Petroleum hydrocarbons F2 (C10-C16)	ug/g	98	ND (10)	ND (10)	18	ND (10)	ND (10)
Petroleum hydrocarbons F2 minus Naphthalene	ug/g	nc	ND (10)	ND (10)	18	ND (10)	ND (10)
Petroleum hydrocarbons F3 (C16-C34)	ug/g	300	167	246	214	ND (50)	125
Petroleum hydrocarbons F3 minus PAH	ug/g	nc	147	241	197	ND (50)	122
Petroleum hydrocarbons F4 (C34-C50)	ug/g	2800	88	115	178	ND (50)	117
Petroleum hydrocarbons F4 gravimetric - silica gell (GHH)	ug/g	2800	270	370	540	-	500
Total Petroleum Hydrocarbons (C6-C50)	ug/g	nc	256	361	410	ND (72)	242
Volatile Organic Compounds							
Acetone	ug/g	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	ug/g	0.21	ND (0.0068)	ND (0.00010) DLHM	0.0075	ND (0.0068)	ND (0.0068)
Bromodichloromethane	ug/g	1.5	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Bromoform	ug/g	0.27	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Bromomethane (Methyl bromide)	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
2-Butanone (Methyl ethyl ketone) (MEK)	ug/g	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Carbon tetrachloride	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Chlorobenzene	ug/g	2.4	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Chloroform (Trichloromethane)	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Dibromochloromethane	ug/g	2.3	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,2-Dibromoethane (Ethylene dibromide)	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,2-Dichlorobenzene	ug/g	1.2	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,3-Dichlorobenzene	ug/g	4.8	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,4-Dichlorobenzene	ug/g	0.083	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Dichlorodifluoromethane (CFC-12)	ug/g	16	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,1-Dichloroethane	ug/g	0.47	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,2-Dichloroethane	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,1-Dichloroethene	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
cis-1,2-Dichloroethene	ug/g	1.9	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
trans-1,2-Dichloroethene	ug/g	0.084	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,2-Dichloropropane	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
cis-1,3-Dichloropropene	ug/g	nc	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.030)
trans-1,3-Dichloropropene	ug/g	nc	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.030)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene	ug/g	nc	ND (0.042)	ND (0.042)	ND (0.042)	ND (0.042)	ND (0.042)
Ethylbenzene	ug/g	1.1	ND (0.018)	ND (0.018)	ND (0.018)	ND (0.018)	ND (0.018)
Hexane	ug/g	2.8	ND (0.050)	0.132	ND (0.050)	ND (0.050)	ND (0.050)
Methyl tert butyl ether (MTBE)	ug/g	0.75	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/g	1.7	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methylene chloride	ug/g	0.1	ND (0.050)	ND (0.080) DLQ	ND (0.050)	ND (0.050)	ND (0.050)
Styrene	ug/g	0.7	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,1,1,2-Tetrachloroethane	ug/g	0.058	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,1,2,2-Tetrachloroethane	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Tetrachloroethene	ug/g	0.28	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Toluene	ug/g	2.3	ND (0.080)	ND (0.080)	ND (0.080)	ND (0.080)	ND (0.080)
1,1,1-Trichloroethane	ug/g	0.38	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
1,1,2-Trichloroethane	ug/g	0.05	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Trichloroethene	ug/g	0.061	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Trichlorofluoromethane (CFC-11)	ug/g	4	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
Vinyl chloride	ug/g	0.02	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Xylenes (total)	ug/g	3.1	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
m&p-Xylenes	ug/g	nc	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.030)
o-Xylene	ug/g	nc	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)

Table 5

Soil Analytical Results - PHCs and VOCs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.

ND - Not present at or above the associated value
- Not analyzed
nc - No criteria
ug/g - micrograms per gram
BGS- Below ground surface
DLHC - Detection limit raised: Dilution required due to high concentration of test analyte(s).
ND - Not detected at the associated reporting limit.
DLHM - Unknown qualifier
DLQ - Detection limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DLVH - Detection limit raised due to interference from Volatile Hydrocarbons on VOC method. Chromatographic elution of interfering peaks in the same region as test analytes prevents a determination of whether VOC analyte is present or absent (above/below egular detection limits).

Table 6

Soil Analytical Results - SVOCs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:			**MW4-18**	**MW4-18**	**MW5-18**	**MW5-18**	**MW6-18**	**MW7-18**	**MW7-18**
Sample ID:			**S-11149990-050418-TW-11**	**S-11149990-050418-TW-12**	**S-11149990-053018-TW-25**	**S-11149990-053018-TW-24**	**S-11149990-050318-TW-10**	**S-11149990-050318-TW-08**	**S-11149990-050318-TW-09**
Sample Date:			**5/4/2018**	**5/4/2018**	**5/30/2018**	**5/30/2018**	**5/3/2018**	**5/3/2018**	**5/3/2018**
Sample Depth:			**1.2-1.8 m BGS**	**4.8-5.1 m BGS**	**1.8-2.4 m BGS**	**0.6-1.2 m BGS**	**2.4-3 m BGS**	**1.2-1.8 m BGS**	**1.8-2.4 m BGS**
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**							
Semi-Volatile Organic Compounds									
Acenaphthene	ug/g	7.9	0.129	-	ND (0.050)	0.093	ND (0.050)	ND (0.050)	-
Acenaphthylene	ug/g	0.15	**0.959**[a]	ND (0.050)	0.084	**0.189**[a]	0.076	0.135	-
Anthracene	ug/g	0.67	**1.09**[a]	ND (0.050)	0.125	0.472	0.124	0.098	-
Benzo(a)anthracene	ug/g	0.5	**1.90 R** [a]	ND (0.050)	**0.648**[a]	**2.07**[a]	0.358	0.276 R	-
Benzo(a)pyrene	ug/g	0.3	**2.19**[a]	ND (0.050)	**0.688**[a]	**2.31**[a]	**0.410**[a]	**0.413**[a]	0.142
Benzo(b)fluoranthene	ug/g	0.78	**1.43**[a]	ND (0.050)	0.599	**1.81**[a]	0.348	0.316	-
Benzo(g,h,i)perylene	ug/g	6.6	1.13	-	0.386	1.24	0.172	0.274	-
Benzo(k)fluoranthene	ug/g	0.78	**1.93**[a]	ND (0.050)	0.629	**1.90**[a]	0.387	0.356	-
Biphenyl (1,1-Biphenyl)	ug/g	0.31	ND (0.050)	-	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	-
bis(2-Chloroethyl)ether	ug/g	0.5	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
bis(2-Ethylhexyl)phthalate (DEHP)	ug/g	5	ND (0.10)	-	0.17	ND (0.10)	ND (0.10)	ND (0.30) DLQ	-
4-Chloroaniline	ug/g	0.5	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
2-Chlorophenol	ug/g	1.6	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
Chrysene	ug/g	7	1.73	-	0.613	1.84	0.322	0.259	-
Dibenz(a,h)anthracene	ug/g	0.1	**0.217**[a]	ND (0.050)	0.084	**0.252**[a]	ND (0.050)	0.053	-
3,3'-Dichlorobenzidine	ug/g	1	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
2,4-Dichlorophenol	ug/g	0.19	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
Diethyl phthalate	ug/g	0.5	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
Dimethyl phthalate	ug/g	0.5	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
2,4-Dimethylphenol	ug/g	38	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
2,4-Dinitrophenol	ug/g	2	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-
2,4-Dinitrotoluene	ug/g	0.5	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
2,4-Dinitrotoluene/2,6-Dinitrotoluene	ug/g	nc	ND (0.14)	-	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.14)	-
2,6-Dinitrotoluene	ug/g	nc	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
Fluoranthene	ug/g	0.69	**3.99**[a]	0.067	**1.06**[a]	**3.29**[a]	0.616	0.348	-
Fluorene	ug/g	62	0.598	-	0.074	0.091	ND (0.050)	ND (0.050)	-
Indeno(1,2,3-cd)pyrene	ug/g	0.38	**1.33**[a]	ND (0.050)	**0.500**[a]	**1.56**[a]	0.229	0.317	-
1-Methylnaphthalene	ug/g	0.99	0.171	-	ND (0.030)	0.067	ND (0.030)	0.036	-
2-Methylnaphthalene	ug/g	nc	0.189	-	ND (0.030)	0.081	ND (0.030)	0.049	-
1-Methylnaphthalene/2-Methylnaphthalene	ug/g	nc	0.360	ND (0.042)	ND (0.042)	0.149	ND (0.042)	0.085	-
Naphthalene	ug/g	0.6	0.275	-	ND (0.050)	0.161	ND (0.050)	0.063	-
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/g	0.67	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
Pentachlorophenol	ug/g	0.1	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
Phenanthrene	ug/g	6.2	3.58	-	0.278	1.41	0.325	0.281	-
Phenol	ug/g	9.4	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	0.29	-
Pyrene	ug/g	78	3.63	-	0.925	3.22	0.557	0.319	-
1,2,4-Trichlorobenzene	ug/g	0.36	ND (0.050)	-	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	-
2,4,5-Trichlorophenol	ug/g	4.4	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-
2,4,6-Trichlorophenol	ug/g	2.1	ND (0.10)	-	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	-

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.

ND - Not present at or above the associated value
- Not analyzed
nc - No criteria
ug/g - micrograms per gram
BGS- Below ground surface
DLHC - Detection limit raised: Dilution required due to high concentration of test analyte(s).
R - The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
ND - Not detected at the associated reporting limit.
DLQ - Detection limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.

0.500[a] Detected concentration exceeds noted criteria

Table 7

Soil Analytical Results - PCBs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:			**MW4-18**	**MW5-18**	**MW5-18**	**MW6-18**	**MW7-18**
Sample ID:			**S-11149990-050418-TW-11**	**S-11149990-053018-TW-25**	**S-11149990-053018-TW-24**	**S-11149990-050318-TW-10**	**S-11149990-050318-TW-08**
Sample Date:			**5/4/2018**	**5/30/2018**	**5/30/2018**	**5/3/2018**	**5/3/2018**
Sample Depth:			**1.2-1.8 m BGS**	**1.8-2.4 m BGS**	**0.6-1.2 m BGS**	**2.4-3 m BGS**	**1.2-1.8 m BGS**
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**					
Polychlorinated Biphenyls							
Aroclor-1242 (PCB-1242)	ug/g	nc	ND (0.010)	ND (0.010)	ND (0.10) DLM	ND (0.010)	ND (0.010)
Aroclor-1248 (PCB-1248)	ug/g	nc	ND (0.010)	ND (0.010)	ND (0.10) DLM	ND (0.010)	ND (0.010)
Aroclor-1254 (PCB-1254)	ug/g	nc	ND (0.010)	ND (0.010)	ND (0.10) DLM	ND (0.010)	0.016 PRAR
Aroclor-1260 (PCB-1260)	ug/g	nc	ND (0.010)	ND (0.010)	ND (0.10) DLM	ND (0.010)	ND (0.010)
Total PCBs	ug/g	0.35	ND (0.020)	ND (0.020)	ND (0.20) DLM	ND (0.020)	ND (0.020)

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.

ND - Not present at or above the associated value

nc - No criteria

ug/g - micrograms per gram

BGS- Below ground surface

DLM - Detection limit adjusted due to sample matrix effects.

PRAR - PCB pattern most closely resembles Aroclor reported.

Table 8

Groundwater Analytical Results - Metals and General Chemistry
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:				**BH4**	**MW1-16**	**MW4-18**	**MW4-18**	**MW5-18**	**MW6-18**	**MW7-18**
Sample ID:				**GW-11149990-040618-009**	**GW-11149990-040618-008**	**GW-11149990-051118-TW-005**	**GW-11149990-051118-TW-006**	**GW-11149990-060118-TW-002**	**GW-11149990-051118-TW-003**	**GW-11149990-051118-TW-001**
Sample Date:				**4/6/2018**	**4/6/2018**	**5/11/2018**	**5/11/2018** Duplicate	**6/1/2018**	**5/11/2018**	**5/11/2018**
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**	**MECP Table 8 Site Condition Standards(b)**							
Metals										
Antimony (dissolved)	ug/L	6	6	ND (0.10)	0.11	ND (1.0) DLHC	ND (1.0) DLHC	ND (1.0) DLHC	ND (1.0) DLHC	ND (1.0) DLHC
Arsenic (dissolved)	ug/L	25	25	12.5	0.44	2.6 DLHC	2.5 DLHC	3.1 DLHC	1.1 DLHC	ND (1.0) DLHC
Barium (dissolved)	ug/L	1000	1000	177	50.1	411 DLHC	416 DLHC	323 DLHC	202 DLHC	118 DLHC
Beryllium (dissolved)	ug/L	4	4	ND (0.10)	ND (0.10)	ND (1.0) DLHC	ND (1.0) DLHC	ND (1.0) DLHC	ND (1.0) DLHC	ND (1.0) DLHC
Boron (dissolved)	ug/L	5000	5000	689	40	1580 DLHC	1640 DLHC	220 DLHC	210 DLHC	380 DLHC
Cadmium (dissolved)	ug/L	2.1	2.1	ND (0.010)	0.056	ND (0.050) DLHC	ND (0.050) DLHC	ND (0.050) DLHC	ND (0.050) DLHC	0.153 DLHC
Chromium (dissolved)	ug/L	50	50	ND (0.50)	ND (0.50)	ND (5.0) DLHC	ND (5.0) DLHC	ND (5.0) DLHC	ND (5.0) DLHC	ND (5.0) DLHC
Cobalt (dissolved)	ug/L	3.8	3.8	1.26	0.28	ND (1.0) DLHC	ND (1.0) DLHC	**6.5 DLHC[a]**	ND (1.0) DLHC	ND (1.0) DLHC
Copper (dissolved)	ug/L	69	69	ND (0.20)	0.93	2.0 DLHC	ND (2.0) DLHC	ND (2.0) DLHC	ND (2.0) DLHC	5.7 DLHC
Lead (dissolved)	ug/L	10	10	ND (0.050)	2.00	ND (0.50) DLHC	ND (0.50) DLHC	ND (0.50) DLHC	ND (0.50) DLHC	ND (0.50) DLHC
Mercury (dissolved)	ug/L	0.1	0.29	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Molybdenum (dissolved)	ug/L	70	70	0.821	2.20	2.56 DLHC	2.52 DLHC	1.70 DLHC	ND (0.50) DLHC	0.96 DLHC
Nickel (dissolved)	ug/L	100	100	1.79	5.96	ND (5.0) DLHC	ND (5.0) DLHC	18.4 DLHC	ND (5.0) DLHC	ND (5.0) DLHC
Selenium (dissolved)	ug/L	10	10	0.219	0.550	ND (0.50) DLHC	ND (0.50) DLHC	6.85 DLHC	ND (0.50) DLHC	1.98 DLHC
Silver (dissolved)	ug/L	1.2	1.2	ND (0.050)	ND (0.050)	ND (0.50) DLHC	ND (0.50) DLHC	ND (0.50) DLHC	ND (0.50) DLHC	ND (0.50) DLHC
Sodium (dissolved)	ug/L	490000	490000	99700	144000	**627000 DLHC[a]**	**606000 DLHC[a]**	482000 DLHC	464000 DLHC	421000 DLHC
Thallium (dissolved)	ug/L	2	2	ND (0.010)	0.168	ND (0.10) DLHC	ND (0.10) DLHC	ND (0.10) DLHC	ND (0.10) DLHC	ND (0.10) DLHC
Uranium (dissolved)	ug/L	20	20	0.091	2.19	0.53 DLHC	0.55 DLHC	0.63 DLHC	0.39 DLHC	3.08 DLHC
Vanadium (dissolved)	ug/L	6.2	6.2	ND (0.50)	ND (0.50)	ND (5.0) DLHC	ND (5.0) DLHC	ND (5.0) DLHC	ND (5.0) DLHC	ND (5.0) DLHC
Zinc (dissolved)	ug/L	890	890	1.5	227	ND (10) DLHC	ND (10) DLHC	19 DLHC	36 DLHC	95 DLHC
General Chemistry										
Chloride	ug/L	790000	790000	208000	273000	**1180000 DLDS[a]**	**1170000 DLDS[a]**	-	**971000 DLHC[a]**	757000 DLHC
Chromium VI (hexavalent)	ug/L	25	25	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Conductivity	mS/cm	nc	nc	1.13	1.13	4.10	4.13	3.29	3.55	3.20
Cyanide, weak acid dissociable	ug/L	nc	nc	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
pH, lab	s.u.	nc	nc	8.12	8.13	7.69	7.72	7.53	7.42	7.26

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.

(b) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition, Residential/Parkland/Institutional/Industrial/Commercial Property Use, Coarse

MW1-16 screened against MECP Table 6 and MECP Table 8, all other wells screened against MECP Table 6.

ND - Not present at or above the associated value
- Not analyzed
nc - No criteria
ug/L - micrograms per litre
mS/cm - millesiemens per centimeter
s.u. - standard units
DLDS - Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC - Detection limit raised: Dilution required due to high concentration of test analyte(s).
DLM - Detection limit adjusted due to sample matrix effects.
J - Estimated concentration.

6.5 DLHC[a] Detected concentration exceeds noted criteria

Table 9

Groundwater Analytical Results - PHCs and VOCs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:				**BH4**	**MW1-16**	**MW4-18**	**MW4-18**	**MW5-18**	**MW6-18**	**MW7-18**
Sample ID:				**GW-11149990-040618-009**	**GW-11149990-040618-008**	**GW-11149990-051118-TW-005**	**GW-11149990-051118-TW-006**	**GW-11149990-060118-TW-002**	**GW-11149990-051118-TW-003**	**GW-11149990-051118-TW-001**
Sample Date:				**4/6/2018**	**4/6/2018**	**5/11/2018**	**5/11/2018**	**6/1/2018**	**5/11/2018**	**5/11/2018**
							Duplicate			
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**	**MECP Table 8 Site Condition Standards(b)**							
Petroleum Hydrocarbons										
Chromatogram to baseline at nC50	none	nc	nc	YES	YES	YES	YES	YES	YES	YES
Petroleum hydrocarbons F1 (C6-C10)	ug/L	420	420	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
Petroleum hydrocarbons F1 minus BTEX	ug/L	420	420	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
Petroleum hydrocarbons F2 (C10-C16)	ug/L	150	150	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Petroleum hydrocarbons F2 minus Naphthalene	ug/L	150	nc	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Petroleum hydrocarbons F3 (C16-C34)	ug/L	500	500	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)
Petroleum hydrocarbons F3 minus PAH	ug/L	500	nc	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)
Petroleum hydrocarbons F4 (C34-C50)	ug/L	500	500	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)	ND (250)
Total Petroleum Hydrocarbons (C6-C50)	none	nc	nc	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)	ND (370)
Volatile Organic Compounds										
Acetone	ug/L	2700	2700	ND (30)	ND (30)	ND (30)	ND (30)	ND (30)	ND (30)	ND (30)
Benzene	ug/L	0.5	5	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromodichloromethane	ug/L	16	16	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Bromoform	ug/L	5	25	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Bromomethane (Methyl bromide)	ug/L	0.89	0.89	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	1800	1800	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)
Carbon tetrachloride	ug/L	0.2	0.79	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Chlorobenzene	ug/L	30	30	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroform (Trichloromethane)	ug/L	2	2.4	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Dibromochloromethane	ug/L	25	25	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.2	0.2	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
1,2-Dichlorobenzene	ug/L	3	3	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,3-Dichlorobenzene	ug/L	59	59	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,4-Dichlorobenzene	ug/L	0.5	1	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Dichlorodifluoromethane (CFC-12)	ug/L	590	590	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1-Dichloroethane	ug/L	5	5	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloroethane	ug/L	0.5	1.6	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethene	ug/L	0.5	1.6	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,2-Dichloroethene	ug/L	1.6	1.6	ND (0.50)	0.54	ND (0.50)	ND (0.50)	ND (0.50)	0.58	ND (0.50)
trans-1,2-Dichloroethene	ug/L	1.6	1.6	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloropropane	ug/L	0.58	5	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene	ug/L	nc	nc	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
trans-1,3-Dichloropropene	ug/L	nc	nc	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene	ug/L	0.5	0.5	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Ethylbenzene	ug/L	2.4	2.4	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Hexane	ug/L	5	51	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl tert butyl ether (MTBE)	ug/L	15	15	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	640	640	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)
Methylene chloride	ug/L	26	50	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	ug/L	5.4	5.4	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,1,2-Tetrachloroethane	ug/L	1.1	1.1	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,2,2-Tetrachloroethane	ug/L	0.5	1	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Tetrachloroethene	ug/L	0.5	1.6	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Toluene	ug/L	24	22	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,1-Trichloroethane	ug/L	23	200	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,2-Trichloroethane	ug/L	0.5	4.7	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichloroethene	ug/L	0.5	1.6	ND (0.50)	**1.88[ab]**	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichlorofluoromethane (CFC-11)	ug/L	150	150	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Vinyl chloride	ug/L	0.5	0.5	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Xylenes (total)	ug/L	72	300	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
m&p-Xylenes	ug/L	nc	nc	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
o-Xylene	ug/L	nc	nc	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)

Table 9

Groundwater Analytical Results - PHCs and VOCs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.

(b) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition, Residential/Parkland/Institutional/Industrial/Commercial Property Use, Coarse Grained Soils.

MW1-16 screened against MECP Table 6 and MECP Table 8, all other wells screened against MECP Table 6.

ND - Not present at or above the associated value
nc - No criteria
ug/L - micrograms per litre

1.88[ab] Detected concentration exceeds noted criteria

Table 10

Groundwater Analytical Results - SVOCs
Phase II Environmental Site Assessment
Wellington Street West Buried Drum Site
Guelph, Ontario

Sample Location:				**BH4**	**MW1-16**	**MW4-18**	**MW4-18**	**MW5-18**	**MW6-18**	**MW7-18**
Sample ID:				**GW-11149990-040618-009**	**GW-11149990-040618-008**	**GW-11149990-051118-TW-005**	**GW-11149990-051118-TW-006**	**GW-11149990-060118-TW-002**	**GW-11149990-051118-TW-003**	**GW-11149990-051118-TW-001**
Sample Date:				**4/6/2018**	**4/6/2018**	**5/11/2018**	**5/11/2018**	**6/1/2018**	**5/11/2018**	**5/11/2018**
Parameters	***Units***	**MECP Table 6 Site Condition Standards(a)**	**MECP Table 8 Site Condition Standards(b)**							
Semi-Volatile Organic Compounds										
Acenaphthene	ug/L	4.1	4.1	ND (0.020)	ND (0.020)	0.139	0.144	0.038	ND (0.020)	ND (0.020)
Acenaphthylene	ug/L	1	1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.082	ND (0.020)	ND (0.020)
Anthracene	ug/L	1	1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.043	ND (0.020)	ND (0.020)
Benzo(a)anthracene	ug/L	1	1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Benzo(a)pyrene	ug/L	0.01	0.01	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Benzo(b)fluoranthene	ug/L	0.1	0.1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Benzo(g,h,i)perylene	ug/L	0.2	0.2	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Benzo(k)fluoranthene	ug/L	0.1	0.1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Biphenyl (1,1-Biphenyl)	ug/L	0.5	0.5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
bis(2-Chloroethyl)ether	ug/L	5	5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	10	10	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
4-Chloroaniline	ug/L	10	10	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
2-Chlorophenol	ug/L	8.9	8.9	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
Chrysene	ug/L	0.1	0.1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Dibenz(a,h)anthracene	ug/L	0.2	0.2	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
3,3'-Dichlorobenzidine	ug/L	0.5	0.5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
2,4-Dichlorophenol	ug/L	20	20	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
Diethyl phthalate	ug/L	30	30	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Dimethyl phthalate	ug/L	30	30	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
2,4-Dimethylphenol	ug/L	59	59	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
2,4-Dinitrophenol	ug/L	10	10	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
2,4-Dinitrotoluene	ug/L	5	5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
2,4-Dinitrotoluene/2,6-Dinitrotoluene	ug/L	nc	nc	ND (0.57)	ND (0.57)	ND (0.57)	ND (0.57)	ND (0.57)	ND (0.57)	ND (0.57)
2,6-Dinitrotoluene	ug/L	5	5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Fluoranthene	ug/L	0.41	0.41	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.117	ND (0.020)	ND (0.020)
Fluorene	ug/L	120	120	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.076	ND (0.020)	ND (0.020)
Indeno(1,2,3-cd)pyrene	ug/L	0.2	0.2	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
1-Methylnaphthalene	ug/L	3.2	3.2	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.080	ND (0.020)	ND (0.020)
2-Methylnaphthalene	ug/L	3.2	3.2	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.099	ND (0.020)	ND (0.020)
1-Methylnaphthalene/2-Methylnaphthalene	ug/L	3.2	3.2	ND (0.028)	ND (0.028)	ND (0.028)	ND (0.028)	0.179	ND (0.028)	ND (0.028)
Naphthalene	ug/L	7	11	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	0.353	ND (0.050)	ND (0.050)
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	120	120	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Pentachlorophenol	ug/L	30	30	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Phenanthrene	ug/L	1	1	ND (0.020)	ND (0.020)	0.025	0.025	0.161	ND (0.020)	ND (0.020)
Phenol	ug/L	890	890	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (2.0) RRR	ND (0.50)	ND (0.50)
Pyrene	ug/L	4.1	4.1	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	0.087	ND (0.020)	ND (0.020)
1,2,4-Trichlorobenzene	ug/L	3	70	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
2,4,5-Trichlorophenol	ug/L	8.9	8.9	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
2,4,6-Trichlorophenol	ug/L	2	2	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)

Notes:

(a) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 6 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, Coarse Grained Soils.

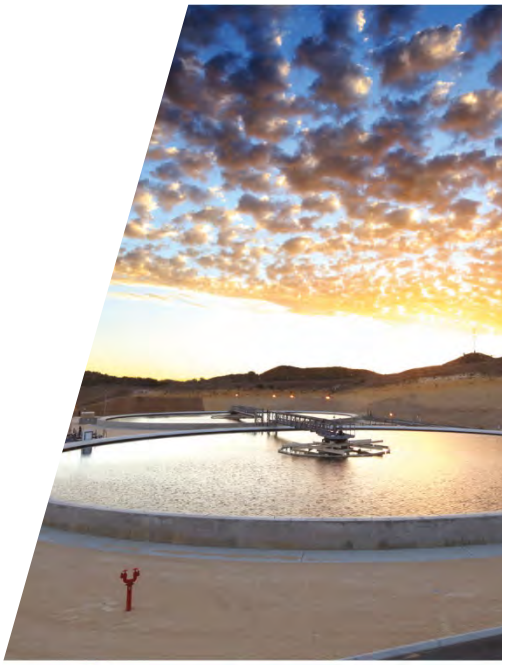
(b) Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 8 Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition, Residential/Parkland/Institutional/Industrial/Commercial Property Use, Coarse Grained Soils.

MW1-16 screened against MECP Table 6 and MECP Table 8, all other wells screened against MECP Table 6.

ND - Not present at or above the associated value
ug/L - micrograms per litre
RRR - Refer to Report Remarks for issues regarding this analysis

Appendices

Appendix A
Geophysical Investigation Report



Geophysical Investigation Report

Wellington Street West Buried Drum Site
Guelph, Ontario

The Corporation of the City of Guelph

Table of Contents

Figure Index

1. Introduction

GHD Limited (GHD) completed a geophysical investigation for the Corporation of the City of Guelph (City) in the area of the Wellington Street West Buried Drum Site that joins Historical Landfill Sites 8 and 9 (Site) between May 2 and 30, 2018. The area of investigation consisted of open and treed greenspace situated just north of Wellington Street West, on either side of Howitt Creek. The area to the north of the Site was bound by two parking lots which were allocated to residents living in two nearby apartment buildings. During construction of the York Trunk Sewer Paisley-Clythe Watermain on the north side of Wellington Street West, the City's contractors exposed and removed buried drums to facilitate construction in this area. The purpose of this investigation is to determine the presence (or absence) of buried drums/metallic objects in the area of the Wellington Street West Buried Drum Site that was not previously investigated. In order to achieve this objective, GHD completed two electromagnetic (EM) surveys and a ground penetrating radar (GPR) survey. A Site Plan outlining the area of investigation is presented on Figure 1.1. Compass directions (north, east, south, and west) described herein are referenced to "Project North", which is assumed to be perpendicular to Wellington Street West.

2. Geophysical Survey Coverage

The geophysical survey coverage completed during this investigation is presented on Figures 2.1, 2.2 and 2.3. The EM31 survey (Figure 2.1) was completed on survey lines generally spaced 4 meters (m) apart, oriented west to east. The EM61 survey was completed on survey lines generally spaced 2 m apart and oriented south to north, as presented on Figure 2.2. The GPR survey was completed on six selected lines as presented on Figure 2.3, to characterize the response of metal detection anomalies which had been identified in the EM61 survey results. Additional coverage was attempted for the GPR survey but could not be completed due to extensive brush and branches which had been disposed of in the treed greenspace area.

3. Geophysical Survey Methods

The instruments utilized for the geophysical investigation can be described as follows.

3.1 EM31 Conductivity Survey

The EM31 consists of transmitter and receiver coils located at opposite ends of a 4 metre (m) long boom. In vertical dipole mode (with the instrument held at hip level), this coil configuration yields an approximate depth of investigation of 5 m below ground surface (bgs). Terrain conductivity values in units of milliSiemens per meter (mS/m) were measured by logging the out-of-phase component of the resultant secondary field. During the course of the survey, data were automatically stored in an Archer2 data logger equipped with a differential global positioning system (DGPS) receiver for position control. Data and DGPS points were collected simultaneously at 1 second intervals. The DGPS locations are reported as Universal Transverse Mercator (UTM) coordinates, World Geodetic System (WGS-84), Zone 17.

It was anticipated that suspected buried drums/objects located at the Site would yield a suppressed or negative EM31 response, indicative of the secondary EM field opposing the primary EM field in the presence of a strong metallic conductor.

3.2 EM61 Metal Detection Survey

The EM61 is a buried metal detector that consists of two rectangular transmitting and receiving coils in a stacked configuration, connected to an Archer2 data logger. The coils measure approximately 0.5 m by 1 m, and are mounted on a wheeled cart. The transmitting coil emits 150 EM pulses per second into the ground at each measuring point. During the off-time between transmitted pulses, receiver coils measure the decay of the transient electrical currents induced by the pulses. Electrical currents in moderately conductive earth materials (including moist clays and mineralized soils) dissipate rapidly, leaving only the more prolonged currents due to buried metal objects. The EM61 detects and measures the prolonged transient currents, yielding a result in millivolts (mV) proportional to the metallic content of the buried object, and inversely proportional to its depth of burial. The effective depth of investigation of the EM61 is approximately 3 m.

It was anticipated that suspected buried drums/objects located at the Site would yield an elevated mV response, indicative of the prolonged induced currents associated with metallic sources.

3.3 Ground Penetrating Radar Survey

The GPR survey was conducted using a Noggin 250 Smart Cart System, which utilizes high frequency (MHz range) EM signals to investigate subsurface conditions. Pulsed EM waves emitted from a transmitting antenna are propagated into the ground, and travel at velocities determined by the electrical properties of earth materials. If a wave hits a buried object or boundary with different electrical properties as it moves downward, part of the wave energy is reflected back to the surface and is detected by a receiving antenna. The reflected wave is stored digitally, and processed as a trace of signal versus amplitude. As the antennas are moved along a survey line, a series of traces are recorded at discrete points. When presented collectively, these traces display a profile of the subsurface. Data traces were collected at equidistant 2.5 centimeter (cm) intervals specified by the GPR operating system along the survey lines, and tracked by an odometer. GPR scans of the subsurface were monitored in real time as the survey was being conducted, by continuously observing the results recorded on the digital video logger (DVL).

GPR signals attenuate or dissipate rapidly in the presence of clayey soils, or soils containing conductive pore fluids. However, little to no signal attenuation was observed during the course of the GPR survey, since the shallow subsurface soils were granular in nature and the investigation was performed when the soils were relatively dry.

Upon completion of all geophysical surveys, all data were downloaded to a computer and compiled for data processing and plotting.

4. Geophysical Survey Results

4.1 EM31 Conductivity Survey Results

The EM31 data were processed as a coloured contour plot and superimposed on an aerial photograph outlining the survey area, as presented on Figure 4.1. The highest intensity conductivity responses are coloured red, while areas of low response are colored blue to purple. All remaining intermediate responses correspond to the colour scale presented on the figure 4.1.

Review of the EM31 results for the northwest corner of the survey coverage and the treed greenspace east of the creek reveals that the background conductivity response generally ranged from 15 to 20 mS/m. Areas of slightly elevated conductivity response (30 to 40 mS/m) were observed along the edges of the parking lots, and along the sidewalks adjacent to Wellington Road values ranged from 50 to 70 mS/m. These responses can be attributed to the use of road salt in the parking lots and on the sidewalks in the previous winter months.

Anomalous responses indicative of buried metal were observed in the treed greenspace area, adjacent to the alignment of the recently installed water main. As previously mentioned, these low to negative responses can be attributed to the direction of the secondary field induced in the metal object(s), which opposes the direction of the primary field. Further evidence of the suppressed response over a metal object can be observed where negative values were recorded over a metal grate. It is also evident that the EM31 survey yielded relatively poor resolution of the suspected buried metal objects, since anomalous responses were only detected over three relatively small areas. The lack of resolution can be attributed to the relatively long (4 m) separation between the transmitter and receiver coils. As such, an EM61 metal detection survey was also completed, in anticipation of improved resolution of anomalous responses.

4.2 EM61 Metal Detection Survey Results

The EM61 metal detection data were processed as a coloured contour plot and superimposed on an aerial photograph outlining the survey area, as presented on Figure 4.2. The highest intensity responses are coloured purple, while areas of low responses are coloured blue. The remaining intermediate responses correspond to the colour scale presented on the figure.

Review of the EM61 survey results indicates that the Site was primarily characterized by background responses ranging from 10 to 20 mV. However, two high intensity anomalies were also detected, both in close proximity of the creek. Field observations confirmed that these responses were attributed to two main sources, namely a metal grate and metal catch basin, which yielded responses between 2,000 and 4,000 mV. In addition to these features, several anomalies with responses ranging from 200 to 2,000 mV were observed within the treed greenspace area east of the creek and adjacent to the recently installed water main. Since no obvious sources of the metal detection responses were evident during the course of the survey, these anomalies are likely associated with former disposal practices at the Site.

4.3 Ground Penetrating Radar Survey Results

The results of the GPR survey are presented on Figure 4.3. As previously mentioned the GPR survey was completed on six selected survey lines, over areas where anomalous responses were observed with the EM61 metal detection survey. Prior to surveying, these lines had to be cleared of branches and brush which had been disposed of in the greenspace area. Clearing of this material ensured that the GPR transmitter and receiver antennas maintained constant contact with the ground surface, and that high quality data were being collected. Trace plots of GPR data collected on all survey lines were examined for arch-shaped signatures (i.e. yperbolic reflectors) indicative of buried metal drums and objects.

Review of the trace plots for the survey lines indicates that in general, the GPR survey achieved a depth of investigation of approximately 2 metres below ground surface (m bgs). Between ground surface and this depth, strong arch-shaped GPR responses indicative of suspected buried metal drums/objects were detected, generally between 0.4 to 1.5 m bgs. Upon comparison, the locations of the GPR anomalies as presented on Figure 4.3 and the EM61 anomalies presented on Figure 4.2 corresponded well.

5. Conclusions

Based on the results of the geophysical investigation presented herein, the following conclusions are presented:

- The EM31 conductivity background response for the majority of the Site ranged from 15 to 20 mS/m; slightly elevated responses were observed near the parking lot, and high intensity responses (50 to 70 mS/m) attributed to road salt were observed adjacent to the sidewalks
- The EM31 survey yielded three anomalous responses indicative of buried metal in the treed greenspace area, adjacent to the alignment of the recently installed water main; these features were characterized by low to negative responses attributed to the direction of the induced secondary field
- Two high intensity anomalies were detected with the EM61 survey, both in close proximity of the creek; field observations confirmed that these responses were attributed to a metal grate and metal catch basin, which yielded responses between 2,000 and 4,000 mV
- The EM61 survey detected several anomalies with responses ranging from 200 to 2,000 mV within the treed greenspace area east of the creek and adjacent to the recently installed water main. Since no obvious sources of the metal detection responses were evident during the course of the survey, these anomalies are likely associated with former disposal practices at the Site.
- The GPR survey revealed that trace plots with reflectors indicative of suspected buried metal drums/objects were detected on all survey lines, at depths ranging from 0.4 m to 1.5 m bgs

Figures

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0 40 80 120m

PROJECT NORTH

GHD

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST, GUELPH, ONTARIO
GEOPHYSICAL INVESTIGATION REPORT

SITE PLAN

11149990-02

Jul 4, 2018

FIGURE 1.1

CAD File: P:\drawings\11149000s\11149990\11149990-REPORT\11149990-02(004)\11149990-02(004)GN\11149990-02(004)GN-WA006.DWG

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date [unknown], Accessed: 2017

0 5 10 15m

Coordinate System:
UTM83-17

PROJECT NORTH

LEGEND

EM31 CONDUCTIVITY SURVEY COVERAGE

GHD

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST, GUELPH, ONTARIO
GEOPHYSICAL INVESTIGATION REPORT

11149990-02

Jul 4, 2018

EM31 CONDUCTIVITY SURVEY COVERAGE

FIGURE 2.1

CAD File: P:\drawings\11149000s\11149990\11149990-REPORT\11149990-02(004)\11149990-02(004)GN\11149990-02(004)GN-WA003.DWG

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0 5 10 15m

Coordinate System:
UTM83-17

PROJECT
NORTH

LEGEND

EM61 METAL DETECTION SURVEY COVERAGE

GHD

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST, GUELPH, ONTARIO
GEOPHYSICAL INVESTIGATION REPORT

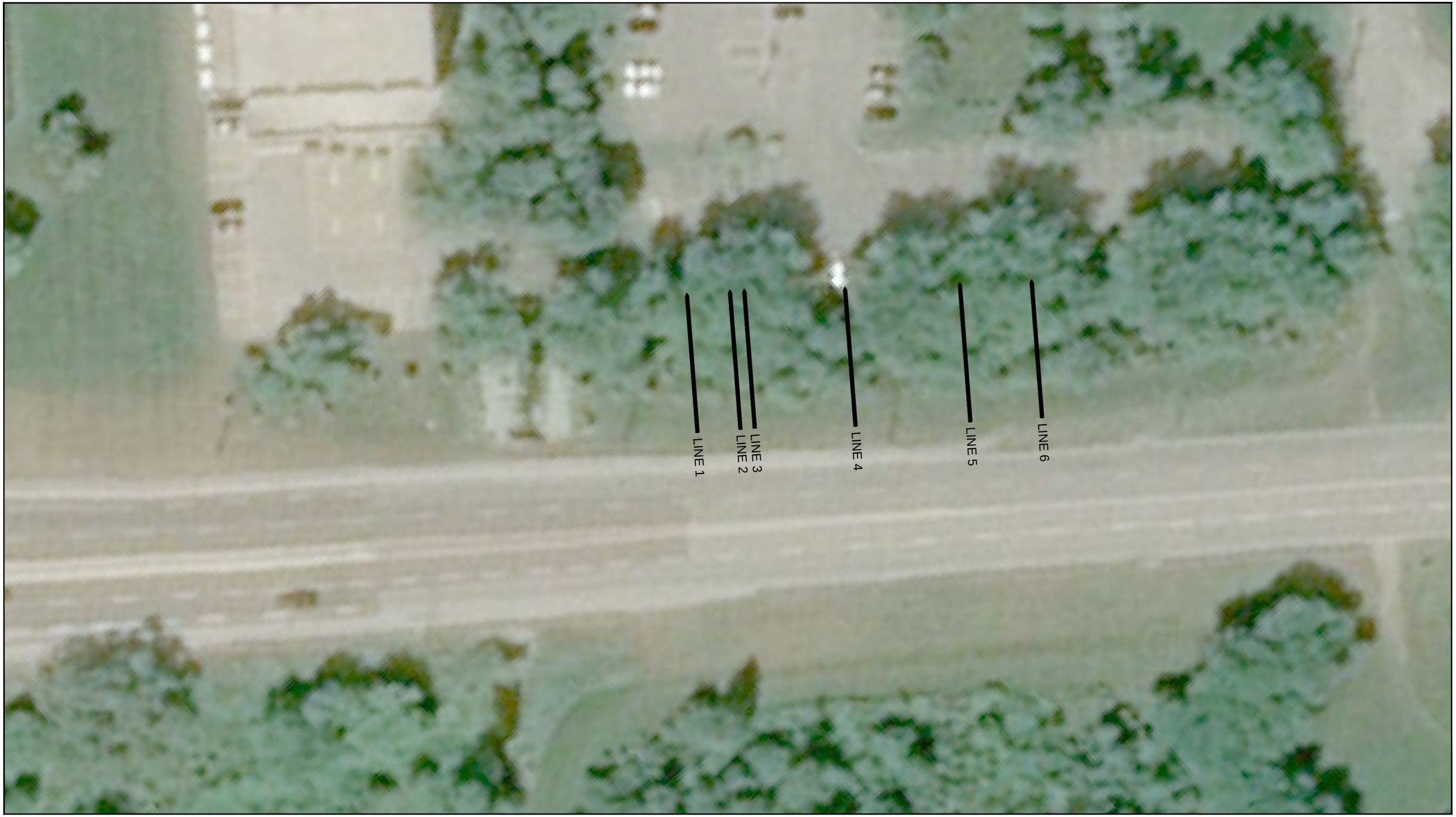
11149990-02

Jul 4, 2018

EM61 METAL DETECTION SURVEY COVERAGE

FIGURE 2.2

CAD File: P:\drawings\11149000s\11149990\11149990-REPORT\11149990-02(004)\11149990-02(004)GN\11149990-02(004)GN-WA002.DWG



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0 5 10 15m

Coordinate System:
UTM83-17

PROJECT
NORTH

LEGEND

GPR SURVEY COVERAGE

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GEOPHYSICAL INVESTIGATION REPORT

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GROUND PENETRATING RADAR SURVEY COVERAGE

FIGURE 2.3

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METAL GRATE

METAL GUARD RAIL

SIDE WALK RESPONSE

EM31 CONDUCTIVITY RESPONSE (mS/m)

100

75

50

25

0

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0 5 10 15m

Coordinate System: UTM83-17

PROJECT NORTH

LEGEND

EM31 METAL DETECTION ANOMALY

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WELLINGTON STREET WEST, GUELPH, ONTARIO
GEOPHYSICAL INVESTIGATION REPORT

EM31 CONDUCTIVITY SURVEY RESULTS

11149990-02

Jul 4, 2018

FIGURE 4.1

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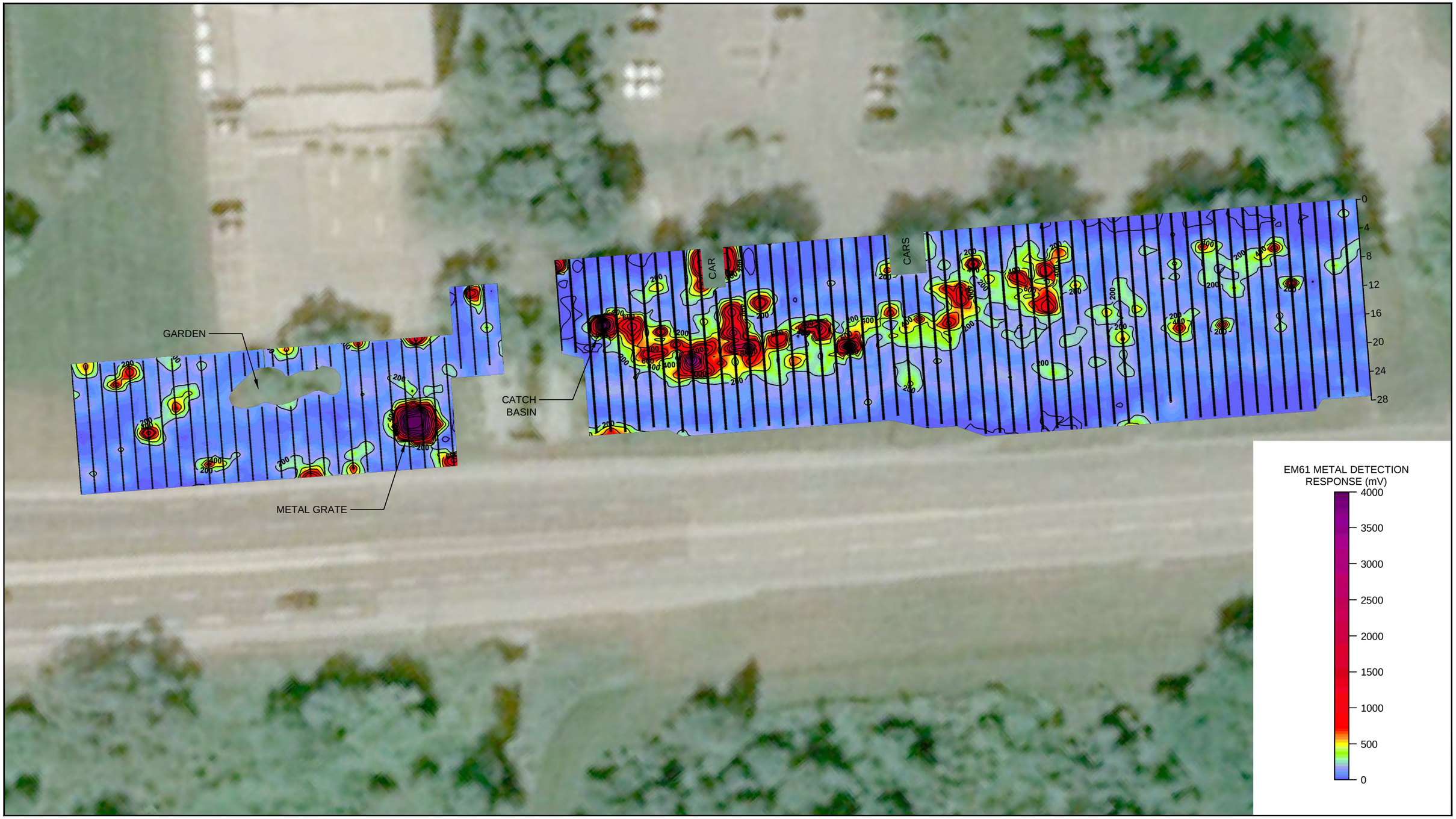

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0 5 10 15m

Coordinate System: UTM83-17

PROJECT NORTH

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST, GUELPH, ONTARIO
GEOPHYSICAL INVESTIGATION REPORT

11149990-02

Jul 4, 2018

EM61 METAL DETECTION SURVEY RESULTS

FIGURE 4.2

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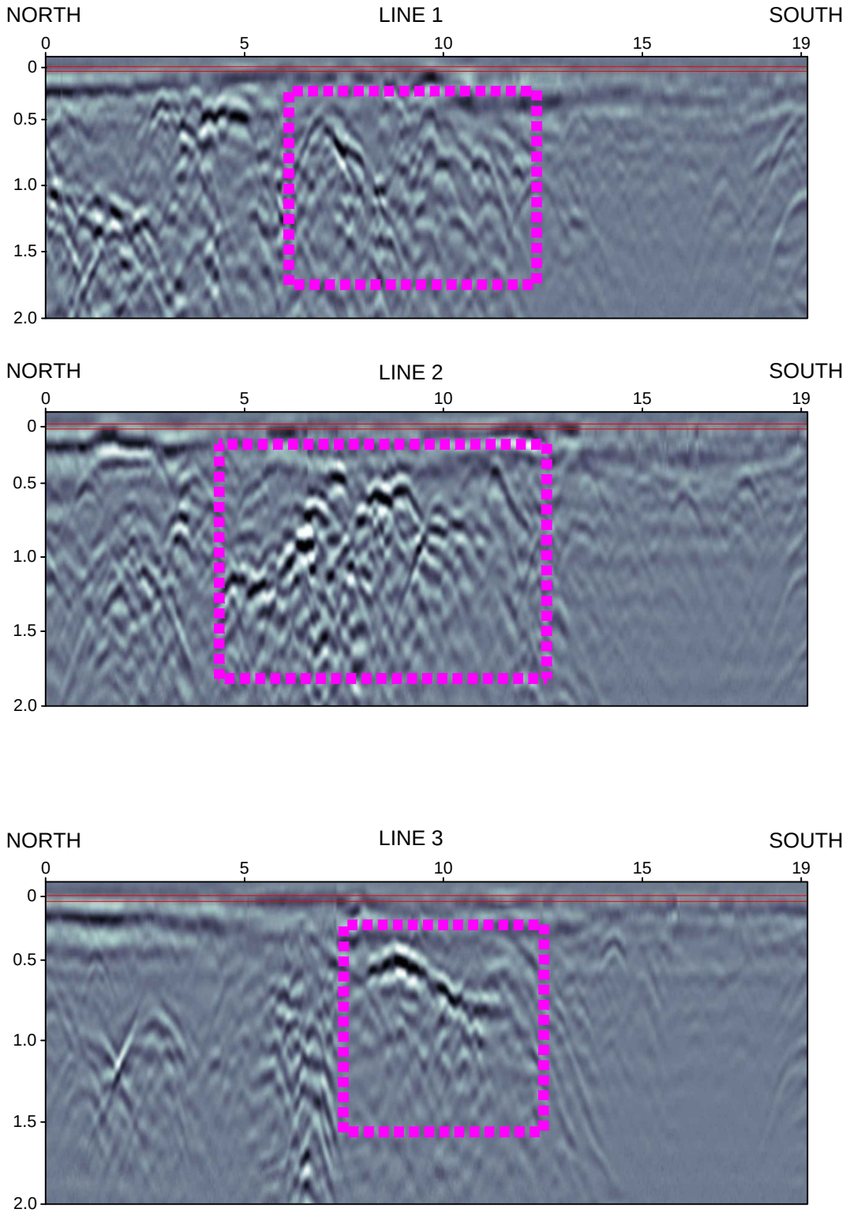

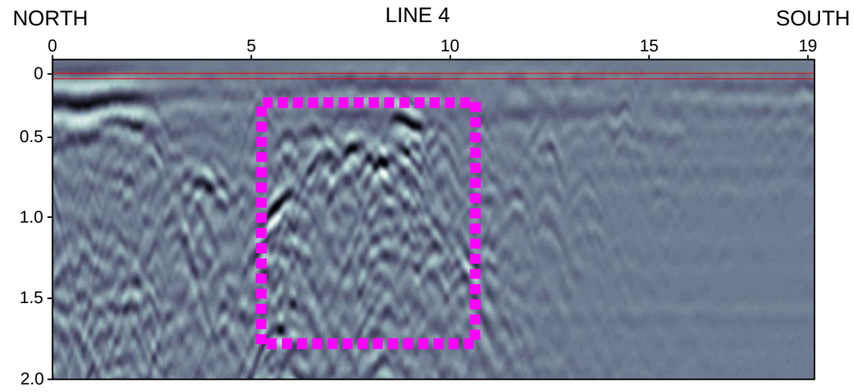

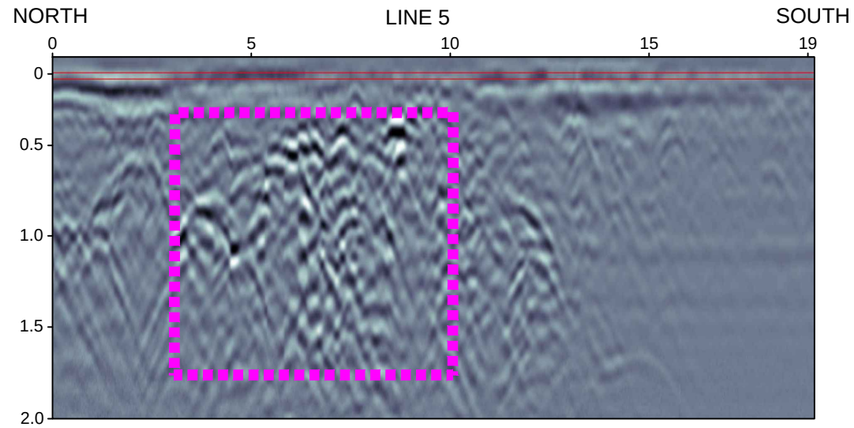

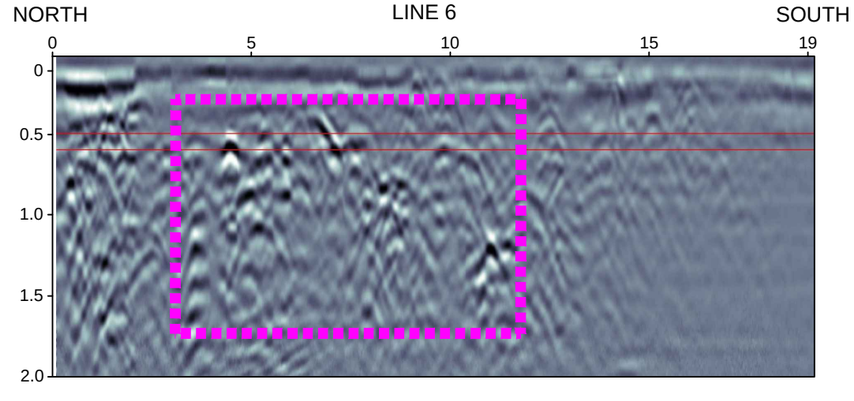

0 1.5 3 4.5m

LEGEND

GPR RESPONSE OF SUSPECTED BURIED DRUMS

GHD

THE CORPORATION OF THE CITY OF GUELPH
WELLINGTON STREET WEST, GUELPH, ONTARIO
GEOPHYSICAL INVESTIGATION REPORT

11149990-02

Jul 4, 2018

GROUND PENETRATING RADAR SURVEY RESULTS

FIGURE 4.3

CAD File: P:\drawings\11149000s\11149990\11149990-REPORT\11149990-02(004)\11149990-02(004)GN\11149990-02(004)GN-WA005.DWG

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Appendix B
Borehole and Monitoring Well Stratigraphic and Instrumentation Logs

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase II ESA
PROJECT NUMBER: 11149990
CLIENT: City of Guelph
LOCATION: Wellington Street West, Guelph, Ontario

HOLE DESIGNATION: MW4-18
DATE COMPLETED: 4 May 2018
DRILLING METHOD: HSA
FIELD PERSONNEL: T. Wittmaier

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' VALUE	P.I.D. (ppm)
	GROUND SURFACE	307.45						
	TOP OF RISER	307.38						
0.0	SAND TOPSOIL, with clay, loose, fine grained, brown, moist, rootlets	307.15				67	12	4.7
0.5	FILL-SAND, with silt and gravel, compact, well graded, brown, dry, trace brick debris		BENTONITE	TW-21		63	12	11.1
1.0		306.23						
1.5	FILL-SILT, with sand, with gravel, stiff, low plasticity, brown, to greyish brown, moist, trace wood and brick debris			TW-11		75	13	13.4
2.0						67	14	8.7
2.5	- with clay at 2.44m BGS					75	8	7.6
3.0	- wet at 3.05m BGS		SAND			58	6	9.6
3.5		303.79						
4.0	FILL-SAND, with gravel and silt, compact, well graded, light brown, wet	303.18				75	18	12.1
4.5	SW-GRAVELLY SAND, with silt, compact, well graded, grey, wet - large cobble from 4.42 to 4.72m BGS					75	50+	11.5
5.0		302.27		TW-12		100	-	11.8
5.5	END OF BOREHOLE @ 5.18m BGS							
6.0								
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								

WELL DETAILS
Screened interval:
305.32 to 302.27m AMSL
2.13 to 5.18m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: 10
Material: PVC
Seal:
307.15 to 305.93m AMSL
0.30 to 1.52m BGS
Material: BENTONITE
Sand Pack:
305.93 to 302.27m AMSL
1.52 to 5.18m BGS
Material: No. 2 SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ June 1, 2018

CHEMICAL ANALYSIS (TW-21, TW-11, TW-12)

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase II ESA
PROJECT NUMBER: 11149990
CLIENT: City of Guelph
LOCATION: Wellington Street West, Guelph, Ontario

HOLE DESIGNATION: MW5-18
DATE COMPLETED: 30 May 2018
DRILLING METHOD: HSA
FIELD PERSONNEL: T. Wittmaier

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' VALUE	P.I.D. (ppm)
	GROUND SURFACE TOP OF RISER	306.25 306.11						
0.0	SILTY SAND TOPSOIL, loose, fine grained, brown, dry, rootlets	305.95	BENTONITE			50	14	3.8
0.5	FILL-SILTY SAND, with gravel, trace clay, compact, well graded, brown, dry, orange and dark brown mottling, trace glass, bricks, asphalt, and wood debris			TW-24		63	6	4.9
1.0	- with clay, less fill debris, light brown, moist from 0.91 to 1.22m BGS							
1.5						67	4	7.1
2.0				TW-25		63	42	10.2
2.5	- dark brown staining, wet from 2.29 to 2.36m BGS		SAND					
3.0	SW-SAND AND GRAVEL, dense, well graded, light brown, wet	303.51 303.20				46	50+	9.1
3.5	BEDROCK, weathered					83	50+	9.3
4.0	END OF BOREHOLE @ 3.96m BGS	302.29				42	50+	8.9
4.5								
5.0								
5.5								
6.0								
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								

WELL DETAILS
Screened interval:
305.03 to 302.29m AMSL
1.22 to 3.96m BGS
Length: 2.74m
Diameter: 51mm
Slot Size: 10
Material: PVC
Seal:
305.95 to 305.34m AMSL
0.30 to 0.91m BGS
Material: BENTONITE
Sand Pack:
305.34 to 302.29m AMSL
0.91 to 3.96m BGS
Material: No. 2 SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ June 1, 2018

CHEMICAL ANALYSIS (TW-24, TW-25)

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase II ESA
PROJECT NUMBER: 11149990
CLIENT: City of Guelph
LOCATION: Wellington Street West, Guelph, Ontario

HOLE DESIGNATION: MW6-18
DATE COMPLETED: 3 May 2018
DRILLING METHOD: HSA
FIELD PERSONNEL: T. Wittmaier

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE P.I.D. (ppm)
	GROUND SURFACE TOP OF RISER	307.71 307.59						
0.5	SILTY SAND TOPSOIL, with gravel, compact, brown, moist, trace rootlets	307.33				75	11	11.5
1.0	FILL-SAND with silt and gravel, compact, well graded, brown, dry - orange mottling, trace asphalt at 0.76m BGS		BENTONITE			67	9	7.3
1.5	FILL-SANDY SILT, with clay, very soft, low plasticity, light brown to grey, moist	306.18				50	5	7.3
2.0						58	3	6.2
2.5				TW-10		83	5	10.3
3.0	- dark brown, rootlets at 3.20m BGS							
3.5	- wet at 3.66m BGS		SAND			83	10	7.8
4.0	BEDROCK, weathered	303.90				50	50+	7.4
4.5								
5.0								
5.5	END OF BOREHOLE @ 5.18m BGS	302.53						
6.0								
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								

WELL DETAILS
Screened interval:
305.57 to 302.53m AMSL
2.13 to 5.18m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: 10
Material: PVC
Seal:
307.40 to 306.18m AMSL
0.30 to 1.52m BGS
Material: BENTONITE
Sand Pack:
306.18 to 305.57m AMSL
1.52 to 2.13m BGS
Material: No. 2 SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ June 1, 2018

CHEMICAL ANALYSIS (TW-10)

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase II ESA
PROJECT NUMBER: 11149990
CLIENT: City of Guelph
LOCATION: Wellington Street West, Guelph, Ontario

HOLE DESIGNATION: MW7-18
DATE COMPLETED: 3 May 2018
DRILLING METHOD: HSA/DTH
FIELD PERSONNEL: T. Wittmaier

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' VALUE	P.I.D. (ppm)
	GROUND SURFACE TOP OF RISER	306.20 306.11						
0.5	SILTY SAND TOPSOIL, loose, fine grained, brown, moist, trace rootlets	305.82	BENTONITE			67	6	5.4
1.0	FILL-SILTY SAND, with gravel, loose, fine grained, brown, moist, trace brick and wood debris, orange mottling					50	4	17.6
1.5				TW-08		50	4	16.6
2.0	SM-SAND, with gravel and silt, compact, well graded, light brown, moist - wet at 2.13m BGS	304.45		TW-09		58	10	6.9
2.5	BEDROCK, weathered	303.84	SAND					
3.0	BEDROCK	303.76				0	50+	-
3.5								
4.0	END OF BOREHOLE @ 3.89m BGS	302.32						
4.5								
5.0								
5.5								
6.0								
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								

WELL DETAILS
Screened interval:
304.98 to 302.32m AMSL
1.22 to 3.89m BGS
Length: 2.67m
Diameter: 51mm
Slot Size: 10
Material: PVC
Seal:
305.90 to 305.29m AMSL
0.30 to 0.91m BGS
Material: BENTONITE
Sand Pack:
305.29 to 302.32m AMSL
0.91 to 3.89m BGS
Material: No. 2 SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ June 1, 2018

CHEMICAL ANALYSIS (TW-08, TW-09)

LOG OF BOREHOLE BH4

Project Name: GUELPH-YORK TRUNK SEWER
Client: THE CORPOATION OF THE CITY OF GUELPH
Northing: 4819925 m

Project No.: GEOTETOB21912AA
Drilling Method Used: POWER AUGER BORING
Easting: 559809 m

Project Location: CITY OF GUELPH, ONTARIO
Date: 27 May 2013
Ground Surface Elevation: 309.56 m

Depth Scale (m)	Stratigraphic Symbol	Depth / Elevation (m)	Description	Number	Type	Blow Counts / 150mm	N Value	Penetration / Strength Results	Moisture / Plasticity	Instrumentation Details	Groundwater Conditions	Headspace Vapor (ppm) [LEL(%)]	Elevation Scale (m)	Comments
		309.4	150 mm thick **TOPSOIL**										309.5	Borehole was advanced by 175 mm diameter Hollow Stem Auger
0.5		0.2	**FILL:** sandy silt, some clay, trace gravel, trace organics, dark brown/brown, moist, compact	1	SS	3 6 5 4	11							
		308.8											309.0	
1.0		0.8	**FILL:** clayey silt, with sand, trace gravel, trace wood/brick/glass pieces, dark brown/brown, moist, firm to hard	2	SS	3 16 15 12	31						308.5	
1.5													308.0	
2.0				3	SS	3 4 4 4	8						307.5	
2.5			100 mm thick silty sand at 2.3 m 100 mm thick crusher run limestone at 2.4 m	4	SS	8 18 27 22	45						307.0	
3.0													306.5	
3.5				5	SS	3 10 12 8	22						306.0	
4.0													305.5	
4.5		305.0											305.0	
		4.6	**FILL:** sandy silt, trace clay, trace gravel, dark brown/blackish, moist, loose	6	SS	6 4 4 3	8							
5.0													304.5	
5.5			AUGER										304.0	
6.0		303.5											303.5	
		6.1	Rock Coring Started											

Penetration Test Values (Blows / 0.3m): ✕ N Values, ◆ Dynamic Cone, + Becker Hammer Test (BPT); 20 40 60 80
Undrained Shear Strength Values (kPa): □ Field Vane, ○ Unconfined, ■ Lab Vane, ● Quick Triaxial, ▲ Pocket Penetrometer; 40 80 120 160
Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit; PL MC LL; 10 20 30 40
GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

	Date / Time	Water Depth (m)	Elevation (m)
At completion	27 May 2013	6.0	303.5
50 mm dia. Monitoring well	4 June 2013	4.6	305.0
50 mm dia. Monitoring well	2 August 2013	5.5	304.1

Rock Core Log Next Page

Additional Notes:
This log is to be read in conjunction with accompanying general notes and borehole log symbols sheet. Stratification lines represent approximate boundary lines between material types, vertical and lateral transitions may be gradual. Water level readings were made at time(s) noted, fluctuations of groundwater levels may occur and should be expected.

Coffey Representatives

D.P.	Originated By
SSH	Prepared By
K.S.	Checked By

LOG OF BOREHOLE BH4

Project Name: GUELPH-YORK TRUNK SEWER
Client: THE CORPOATION OF THE CITY OF GUELPH
Date: 27 May 2013
Project No.: GEOTETOB21912AA
Drilling Method Used: HQ
Northing: 4819925 m
Project Location: CITY OF GUELPH, ONTARIO
Ground Surface Elevation: 309.6 m
Easting: 559809 m
Borehole Location: N 4819925; E 559809
Datum Elevation: AHD
Diameter: 175/63.5 mm

(m) STRATA ELEV / DEPTH	Stratigraphic Symbol	ROCK DESCRIPTION	(m) CORE ELEV / DEPTH	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	CORE SAMPLE CORE RATE (m/mm)	TOTAL CORE RECOVERY (%)	SOLID CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3m) 5 10 15 20	DISCONTINUITIES AND WEATHERING	GROUND WATER CONDITIONS	Groundwater Conditions	HYDRAULIC CONDUCTIVITY K (cm/sec) [P (kPa)]	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cc) [E (MPa)]
303.5			303.5																
6.1		Slightly weathered to fresh, grey, medium strong, DOLOMITE LIMESTONE very thinly bedded to medium	6.1	C-1	HQ		93	77		58		6.60m: JN, 5°, UN, R3, C 6.80m: JN, 0-5°, UN, R3,O- C 6.90m: 3JN, 10-15-30°, UN, R3, O 7.40m: 2JN, 5-10°, UN, R3, O 7.60m: JN, 15°, UN, R3, modedly closed 7.60m: JN, 5°, UN, R3				36.7 30.2	26.4 37.5		
301.9 7.6		BH4 TERMINATED AT 7.6m BGL	301.9 7.6																

	Date / Time	Water Depth (m)	Elevation (m)
At completion	27 May 2013	6.0	303.5
50 mm dia. Monitoring well	4 June 2013	4.6	305.0
50 mm dia. Monitoring well	2 August 2013	5.5	304.1

E = Modulus of Elasticity

coffey

Additional Notes:
This log is to be read in conjunction with accompanying general notes and borehole log symbols sheet. Stratification lines represent approximate boundary lines between material types, vertical and lateral transitions may be gradual. Water level readings were made at time(s) noted, fluctuations of groundwater levels may occur and should be expected.

Coffey Representatives

D.P.	Originated By
SSH	Prepared By
K.S.	Checked By

COFFEY ROCK CORE LOG GEOTETOB21912AA.GPJ COFFEY STANDARD.GDT 4/11/13

Monitoring Well: MW1-16

Project:	Membro Replacement Well	**Drilling method:**	CME 55, Hollow Stem Auger and Air Rotary
Client:	City of Guelph	**Date started/completed:**	11-May-2016
Location:	36 Wellington Street West, Guelph ON	**Ground surface elevation:**	304.93 m AMSL
Number:	160900824	**Top of casing elevation:**	305.81 m AMSL
Field investigator:	N.Spina	**Easting:**	4819960
Contractor:	Aardvark Drilling Inc.	**Northing:**	559944

SUBSURFACE PROFILE				HYDROGEOLOGY		SAMPLE DETAILS				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Hydro Stratigraphic Unit	Description	Sample Number	Sample Type	Recovery	N Value	Diagram	Description
				305.75								Above Ground Casing Stick-Up: 0.83 m
0	0		Ground Surface	304.93								
			TOPSOIL (SILTY SAND) fine grained sand, trace fine grained gravel, trace organics (roots), subrounded gravel, very dark brown (7.5 YR 2.5/2), moist	0.00 304.72								Cement Surface Seal 0 to 0.3 m
				0.20			1	SS	14.5" 60%	1-3-5->50/5.5" (>8)		
			SAND fine grained sand, some coarse grained sand,trace to some silt, trace medium grained sand, trace fine grained gravel, subrounded gravel, well graded, loose, yellowish brown (10YR 5/6), moist broken cobble at 0.36 m BGS transition to compact at 0.76 m BGS trace subrounded to subangular coarse grained gravel from 0.76 m to 1.4 m BGS			Overburden					210 mm diameter borehole 0 to 1.5 m
5	1						2	SS	15.5" 86%	10-11->50/5.5" (>11)		Bentonite Chips 0.3 to 1.5 m
				303.40								Static Water Level 1.26 m 12-May-2016
			LIMESTONE white	1.52			3	SS	1" 100%	>50/1"/1.0" (50/1"/1.0")		51 mm diameter Schedule 40 PVC Riser
	2											98.4 mm diameter borehole 1.5 to 4.6 m
							4	GB	n/a	n/a		Coated Bentonite Pellets 1.5 to 3.0 m
10	3				Bedrock	Guelph Formation						No. 2 Silica Sand 2.7 to 4.6 m
							5	GB	n/a	n/a		Schedule 40 No. 10 slot PVC Screen 3.0 to 4.6 m
	4			300.51								
15			LIMESTONE very dark brown	4.42 300.36	Bedrock	Eramosa Formation	6	GB	n/a	n/a		
	5		End of Borehole	4.57								
20	6											

Screen Interval: 3.02 - 4.54 m BGS
Sand Pack Interval: 2.74 - 4.57 m BGS
Well Seal Interval: 0.30 - 2.74 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
SS - split-spoon sample
GB - grab sample
n/a - not available

MOECC WWR Tag No. A201605

Stantec

Drawn By/Checked By: N.Spina/M. Fraser

STANTEC BOREHOLE AND WELL V2 160900824_MEMBRO_BHLOGS.GPJ STANTEC - DATA TEMPLATE.GDT 6/20/16 MJFRASER

Appendix C
Laboratory Analytical Reports

GHD Limited (Waterloo)
ATTN: JENNIFER BALKWILL
651 COLBY DRIVE
WATERLOO ON N2V 1C2

Date Received: 06-APR-18
Report Date: 25-JUL-18 12:50 (MT)
Version: FINAL REV. 3

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2077097

Project P.O. #: 73511036
Job Reference: 11149990-04
C of C Numbers:
Legal Site Desc:

Comments: WS/WT 17-APR-18 DOC samples lab filtered on April 8, 2018.

Report #1

Rick Hawthorne
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-8 GW-11149990-040618-008 Sampled By: T. WITTMAIER on 06-APR-18 @ 12:40 Matrix: WATER							
Physical Tests							
Conductivity	1.13		0.0030	mS/cm		07-APR-18	R4007280
pH	8.13		0.10	pH units		07-APR-18	R4007280
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	298		10	mg/L		11-APR-18	R4008410
Ammonia, Total (as N)	0.149	DLHC	0.040	mg/L		09-APR-18	R4007184
Chloride (Cl)	273	DLDS	2.5	mg/L		11-APR-18	R4009126
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		11-APR-18	R4009126
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		11-APR-18	R4009126
Total Kjeldahl Nitrogen	0.21		0.15	mg/L	11-APR-18	11-APR-18	R4008601
Phosphorus, Total	0.0037		0.0030	mg/L	11-APR-18	12-APR-18	R4008707
Sulfate (SO4)	29.3	DLDS	1.5	mg/L		11-APR-18	R4009126
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		11-APR-18	R4008951
Organic / Inorganic Carbon							
Dissolved Organic Carbon	3.6		1.0	mg/L		09-APR-18	R4007873
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					09-APR-18	R4006771
Dissolved Metals Filtration Location	FIELD					09-APR-18	R4006710
Antimony (Sb)-Dissolved	0.11		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Arsenic (As)-Dissolved	0.44		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Barium (Ba)-Dissolved	50.1		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Boron (B)-Dissolved	40		10	ug/L	09-APR-18	09-APR-18	R4007206
Cadmium (Cd)-Dissolved	0.056		0.010	ug/L	09-APR-18	09-APR-18	R4007206
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	09-APR-18	09-APR-18	R4007206
Cobalt (Co)-Dissolved	0.28		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Copper (Cu)-Dissolved	0.93		0.20	ug/L	09-APR-18	09-APR-18	R4007206
Lead (Pb)-Dissolved	2.00		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	09-APR-18	09-APR-18	R4006952
Molybdenum (Mo)-Dissolved	2.20		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Nickel (Ni)-Dissolved	5.96		0.50	ug/L	09-APR-18	09-APR-18	R4007206
Selenium (Se)-Dissolved	0.550		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Sodium (Na)-Dissolved	144000	DLHC	5000	ug/L	09-APR-18	09-APR-18	R4007206
Thallium (Tl)-Dissolved	0.168		0.010	ug/L	09-APR-18	09-APR-18	R4007206
Uranium (U)-Dissolved	2.19		0.010	ug/L	09-APR-18	09-APR-18	R4007206
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	09-APR-18	09-APR-18	R4007206
Zinc (Zn)-Dissolved	227		1.0	ug/L	09-APR-18	09-APR-18	R4007206
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		09-APR-18	R4007515
Aggregate Organics							
Phenols (4AAP)	<0.0010		0.0010	mg/L		09-APR-18	R4007047

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-8 GW-11149990-040618-008 Sampled By: T. WITTMAIER on 06-APR-18 @ 12:40 Matrix: WATER							
Aggregate Organics **Volatile Organic Compounds**							
Acetone	<30		30	ug/L		10-APR-18	R4007413
Benzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Bromodichloromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
Bromoform	<5.0		5.0	ug/L		10-APR-18	R4007413
Bromomethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Carbon tetrachloride	<0.20		0.20	ug/L		10-APR-18	R4007413
Chlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Dibromochloromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
Chloroform	<1.0		1.0	ug/L		10-APR-18	R4007413
1,2-Dibromoethane	<0.20		0.20	ug/L		10-APR-18	R4007413
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
1,1-Dichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,2-Dichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
cis-1,2-Dichloroethylene	0.54		0.50	ug/L		10-APR-18	R4007413
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Methylene Chloride	<5.0		5.0	ug/L		10-APR-18	R4007413
1,2-Dichloropropane	<0.50		0.50	ug/L		10-APR-18	R4007413
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-APR-18	R4007413
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-APR-18	R4007413
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-APR-18	
Ethylbenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
n-Hexane	<0.50		0.50	ug/L		10-APR-18	R4007413
Methyl Ethyl Ketone	<20		20	ug/L		10-APR-18	R4007413
Methyl Isobutyl Ketone	<20		20	ug/L		10-APR-18	R4007413
MTBE	<2.0		2.0	ug/L		10-APR-18	R4007413
Styrene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Tetrachloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Toluene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Trichloroethylene	1.88		0.50	ug/L		10-APR-18	R4007413
Trichlorofluoromethane	<5.0		5.0	ug/L		10-APR-18	R4007413
Vinyl chloride	<0.50		0.50	ug/L		10-APR-18	R4007413
o-Xylene	<0.30		0.30	ug/L		10-APR-18	R4007413

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-8 GW-11149990-040618-008 Sampled By: T. WITTMAIER on 06-APR-18 @ 12:40 Matrix: WATER							
Volatile Organic Compounds							
m+p-Xylenes	<0.40		0.40	ug/L		10-APR-18	R4007413
Xylenes (Total)	<0.50		0.50	ug/L		10-APR-18	
Surrogate: 4-Bromofluorobenzene	98.8		70-130	%		10-APR-18	R4007413
Surrogate: 1,4-Difluorobenzene	102.2		70-130	%		10-APR-18	R4007413
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-APR-18	R4007413
F1-BTEX	<25		25	ug/L		12-APR-18	
F2 (C10-C16)	<100		100	ug/L	09-APR-18	10-APR-18	R4007710
F2-Naphth	<100		100	ug/L		12-APR-18	
F3 (C16-C34)	<250		250	ug/L	09-APR-18	10-APR-18	R4007710
F3-PAH	<250		250	ug/L		12-APR-18	
F4 (C34-C50)	<250		250	ug/L	09-APR-18	10-APR-18	R4007710
Total Hydrocarbons (C6-C50)	<370		370	ug/L		12-APR-18	
Chrom. to baseline at nC50	YES				09-APR-18	10-APR-18	R4007710
Surrogate: 2-Bromobenzotrifluoride	96.9		60-140	%	09-APR-18	10-APR-18	R4007710
Surrogate: 3,4-Dichlorotoluene	74.0		60-140	%		10-APR-18	R4007413
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Acenaphthylene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Anthracene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(a)anthracene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(a)pyrene	<0.010		0.010	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(b)fluoranthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(k)fluoranthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Chrysene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Fluoranthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Fluorene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-APR-18	
1-Methylnaphthalene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
2-Methylnaphthalene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Naphthalene	<0.050		0.050	ug/L	09-APR-18	12-APR-18	R4009214
Phenanthrene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Pyrene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Surrogate: d10-Acenaphthene	97.7		60-140	%	09-APR-18	12-APR-18	R4009214
Surrogate: d12-Chrysene	81.9		60-140	%	09-APR-18	12-APR-18	R4009214
Surrogate: d8-Naphthalene	99.6		60-140	%	09-APR-18	12-APR-18	R4009214
Surrogate: d10-Phenanthrene	99.1		60-140	%	09-APR-18	12-APR-18	R4009214
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-8 GW-11149990-040618-008 Sampled By: T. WITTMAIER on 06-APR-18 @ 12:40 Matrix: WATER							
Semi-Volatile Organics							
4-Chloroaniline	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2-Chlorophenol	<0.30		0.30	ug/L	09-APR-18	10-APR-18	R4008098
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dichlorophenol	<0.30		0.30	ug/L	09-APR-18	10-APR-18	R4008098
Diethylphthalate	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
Dimethylphthalate	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dimethylphenol	<0.50		0.50	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dinitrophenol	<1.0		1.0	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dinitrotoluene	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,6-Dinitrotoluene	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-APR-18	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	09-APR-18	10-APR-18	R4008098
Pentachlorophenol	<0.50		0.50	ug/L	09-APR-18	10-APR-18	R4008098
Phenol	<0.50		0.50	ug/L	09-APR-18	10-APR-18	R4008098
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
Surrogate: 2-Fluorobiphenyl	95.6		50-140	%	09-APR-18	10-APR-18	R4008098
Surrogate: Nitrobenzene d5	100.1		50-140	%	09-APR-18	10-APR-18	R4008098
Surrogate: Phenol d5	48.4		30-130	%	09-APR-18	10-APR-18	R4008098
Surrogate: p-Terphenyl d14	100.5		60-140	%	09-APR-18	10-APR-18	R4008098
Surrogate: 2,4,6-Tribromophenol	102.1		50-140	%	09-APR-18	10-APR-18	R4008098
L2077097-9 GW-11149990-040618-009 Sampled By: T. WITTMAIER on 06-APR-18 @ 13:50 Matrix: WATER							
Physical Tests							
Conductivity	1.13		0.0030	mS/cm		07-APR-18	R4007280
pH	8.12		0.10	pH units		07-APR-18	R4007280
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	475		10	mg/L		11-APR-18	R4008410
Ammonia, Total (as N)	10.0	DLHC	0.40	mg/L		09-APR-18	R4007184
Chloride (Cl)	208	DLDS	2.5	mg/L		11-APR-18	R4009126
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		11-APR-18	R4009126
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		11-APR-18	R4009126
Total Kjeldahl Nitrogen	12.3	DLHC	0.30	mg/L	11-APR-18	11-APR-18	R4008601
Phosphorus, Total	0.0524		0.0030	mg/L	11-APR-18	12-APR-18	R4008707
Sulfate (SO4)	5.0	DLDS	1.5	mg/L		11-APR-18	R4009126
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		11-APR-18	R4008951
Organic / Inorganic Carbon							

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-9 GW-11149990-040618-009 Sampled By: T. WITTMAIER on 06-APR-18 @ 13:50 Matrix: WATER							
Organic / Inorganic Carbon							
Dissolved Organic Carbon	10.5		1.0	mg/L		09-APR-18	R4007873
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					09-APR-18	R4006771
Dissolved Metals Filtration Location	FIELD					09-APR-18	R4006710
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Arsenic (As)-Dissolved	12.5		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Barium (Ba)-Dissolved	177		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Boron (B)-Dissolved	689		10	ug/L	09-APR-18	09-APR-18	R4007206
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	09-APR-18	09-APR-18	R4007206
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	09-APR-18	09-APR-18	R4007206
Cobalt (Co)-Dissolved	1.26		0.10	ug/L	09-APR-18	09-APR-18	R4007206
Copper (Cu)-Dissolved	<0.20		0.20	ug/L	09-APR-18	09-APR-18	R4007206
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	09-APR-18	09-APR-18	R4006952
Molybdenum (Mo)-Dissolved	0.821		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Nickel (Ni)-Dissolved	1.79		0.50	ug/L	09-APR-18	09-APR-18	R4007206
Selenium (Se)-Dissolved	0.219		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	09-APR-18	09-APR-18	R4007206
Sodium (Na)-Dissolved	99700		500	ug/L	09-APR-18	09-APR-18	R4007206
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	09-APR-18	09-APR-18	R4007206
Uranium (U)-Dissolved	0.091		0.010	ug/L	09-APR-18	09-APR-18	R4007206
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	09-APR-18	09-APR-18	R4007206
Zinc (Zn)-Dissolved	1.5		1.0	ug/L	09-APR-18	09-APR-18	R4007206
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		09-APR-18	R4007515
Aggregate Organics							
Phenols (4AAP)	0.0029		0.0010	mg/L		09-APR-18	R4007047
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-APR-18	R4007413
Benzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Bromodichloromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
Bromoform	<5.0		5.0	ug/L		10-APR-18	R4007413
Bromomethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Carbon tetrachloride	<0.20		0.20	ug/L		10-APR-18	R4007413
Chlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Dibromochloromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
Chloroform	<1.0		1.0	ug/L		10-APR-18	R4007413
1,2-Dibromoethane	<0.20		0.20	ug/L		10-APR-18	R4007413
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-9 GW-11149990-040618-009 Sampled By: T. WITTMAIER on 06-APR-18 @ 13:50 Matrix: WATER							
Volatile Organic Compounds							
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
1,1-Dichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,2-Dichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Methylene Chloride	<5.0		5.0	ug/L		10-APR-18	R4007413
1,2-Dichloropropane	<0.50		0.50	ug/L		10-APR-18	R4007413
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-APR-18	R4007413
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-APR-18	R4007413
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-APR-18	
Ethylbenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
n-Hexane	<0.50		0.50	ug/L		10-APR-18	R4007413
Methyl Ethyl Ketone	<20		20	ug/L		10-APR-18	R4007413
Methyl Isobutyl Ketone	<20		20	ug/L		10-APR-18	R4007413
MTBE	<2.0		2.0	ug/L		10-APR-18	R4007413
Styrene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Tetrachloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Toluene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Trichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Trichlorofluoromethane	<5.0		5.0	ug/L		10-APR-18	R4007413
Vinyl chloride	<0.50		0.50	ug/L		10-APR-18	R4007413
o-Xylene	<0.30		0.30	ug/L		10-APR-18	R4007413
m+p-Xylenes	<0.40		0.40	ug/L		10-APR-18	R4007413
Xylenes (Total)	<0.50		0.50	ug/L		10-APR-18	
Surrogate: 4-Bromofluorobenzene	99.4		70-130	%		10-APR-18	R4007413
Surrogate: 1,4-Difluorobenzene	102.2		70-130	%		10-APR-18	R4007413
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-APR-18	R4007413
F1-BTEX	<25		25	ug/L		12-APR-18	
F2 (C10-C16)	<100		100	ug/L	09-APR-18	10-APR-18	R4007710
F2-Naphth	<100		100	ug/L		12-APR-18	
F3 (C16-C34)	<250		250	ug/L	09-APR-18	10-APR-18	R4007710
F3-PAH	<250		250	ug/L		12-APR-18	
F4 (C34-C50)	<250		250	ug/L	09-APR-18	10-APR-18	R4007710
Total Hydrocarbons (C6-C50)	<370		370	ug/L		12-APR-18	
Chrom. to baseline at nC50	YES				09-APR-18	10-APR-18	R4007710

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-9 GW-11149990-040618-009 Sampled By: T. WITTMAIER on 06-APR-18 @ 13:50 Matrix: WATER							
Hydrocarbons							
Surrogate: 2-Bromobenzotrifluoride	99.6		60-140	%	09-APR-18	10-APR-18	R4007710
Surrogate: 3,4-Dichlorotoluene	75.9		60-140	%		10-APR-18	R4007413
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Acenaphthylene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Anthracene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(a)anthracene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(a)pyrene	<0.010		0.010	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(b)fluoranthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Benzo(k)fluoranthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Chrysene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Fluoranthene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Fluorene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-APR-18	
1-Methylnaphthalene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
2-Methylnaphthalene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Naphthalene	<0.050		0.050	ug/L	09-APR-18	12-APR-18	R4009214
Phenanthrene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Pyrene	<0.020		0.020	ug/L	09-APR-18	12-APR-18	R4009214
Surrogate: d10-Acenaphthene	98.9		60-140	%	09-APR-18	12-APR-18	R4009214
Surrogate: d12-Chrysene	91.5		60-140	%	09-APR-18	12-APR-18	R4009214
Surrogate: d8-Naphthalene	101.8		60-140	%	09-APR-18	12-APR-18	R4009214
Surrogate: d10-Phenanthrene	101.7		60-140	%	09-APR-18	12-APR-18	R4009214
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
4-Chloroaniline	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2-Chlorophenol	<0.30		0.30	ug/L	09-APR-18	10-APR-18	R4008098
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dichlorophenol	<0.30		0.30	ug/L	09-APR-18	10-APR-18	R4008098
Diethylphthalate	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
Dimethylphthalate	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dimethylphenol	<0.50		0.50	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dinitrophenol	<1.0		1.0	ug/L	09-APR-18	10-APR-18	R4008098
2,4-Dinitrotoluene	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,6-Dinitrotoluene	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-APR-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-9 GW-11149990-040618-009 Sampled By: T. WITTMAIER on 06-APR-18 @ 13:50 Matrix: WATER							
Semi-Volatile Organics							
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	09-APR-18	10-APR-18	R4008098
Pentachlorophenol	<0.50		0.50	ug/L	09-APR-18	10-APR-18	R4008098
Phenol	<0.50		0.50	ug/L	09-APR-18	10-APR-18	R4008098
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	09-APR-18	10-APR-18	R4008098
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	09-APR-18	10-APR-18	R4008098
Surrogate: 2-Fluorobiphenyl	96.8		50-140	%	09-APR-18	10-APR-18	R4008098
Surrogate: Nitrobenzene d5	99.4		50-140	%	09-APR-18	10-APR-18	R4008098
Surrogate: Phenol d5	45.1		30-130	%	09-APR-18	10-APR-18	R4008098
Surrogate: p-Terphenyl d14	95.9		60-140	%	09-APR-18	10-APR-18	R4008098
Surrogate: 2,4,6-Tribromophenol	106.9		50-140	%	09-APR-18	10-APR-18	R4008098
L2077097-12 TB-11149990-040518-001 Sampled By: T. WITTMAIER on 05-APR-18 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-APR-18	R4007413
Benzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Bromodichloromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
Bromoform	<5.0		5.0	ug/L		10-APR-18	R4007413
Bromomethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Carbon tetrachloride	<0.20		0.20	ug/L		10-APR-18	R4007413
Chlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Dibromochloromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
Chloroform	<1.0		1.0	ug/L		10-APR-18	R4007413
1,2-Dibromoethane	<0.20		0.20	ug/L		10-APR-18	R4007413
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-APR-18	R4007413
1,1-Dichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,2-Dichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Methylene Chloride	<5.0		5.0	ug/L		10-APR-18	R4007413
1,2-Dichloropropane	<0.50		0.50	ug/L		10-APR-18	R4007413
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-APR-18	R4007413
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-APR-18	R4007413
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-APR-18	
Ethylbenzene	<0.50		0.50	ug/L		10-APR-18	R4007413
n-Hexane	<0.50		0.50	ug/L		10-APR-18	R4007413
Methyl Ethyl Ketone	<20		20	ug/L		10-APR-18	R4007413

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2077097-12 TB-11149990-040518-001 Sampled By: T. WITTMAIER on 05-APR-18 Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		10-APR-18	R4007413
MTBE	<2.0		2.0	ug/L		10-APR-18	R4007413
Styrene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Tetrachloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Toluene	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-APR-18	R4007413
Trichloroethylene	<0.50		0.50	ug/L		10-APR-18	R4007413
Trichlorofluoromethane	<5.0		5.0	ug/L		10-APR-18	R4007413
Vinyl chloride	<0.50		0.50	ug/L		10-APR-18	R4007413
o-Xylene	<0.30		0.30	ug/L		10-APR-18	R4007413
m+p-Xylenes	<0.40		0.40	ug/L		10-APR-18	R4007413
Xylenes (Total)	<0.50		0.50	ug/L		10-APR-18	
Surrogate: 4-Bromofluorobenzene	99.2		70-130	%		10-APR-18	R4007413
Surrogate: 1,4-Difluorobenzene	102.7		70-130	%		10-APR-18	R4007413
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-APR-18	R4007413
F1-BTEX	<25		25	ug/L		10-APR-18	
Surrogate: 3,4-Dichlorotoluene	80.7		60-140	%		10-APR-18	R4007413

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Dichlorodifluoromethane	MES	L2077097-12, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2077097-8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2077097-8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2077097-8, -9
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L2077097-8, -9
Matrix Spike	Nitrate (as N)	MS-B	L2077097-8, -9
Matrix Spike	Phosphorus, Total	MS-B	L2077097-8, -9
Matrix Spike	Total Kjeldahl Nitrogen	MS-B	L2077097-8, -9

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

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).

ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

C-DIS-ORG-WT	Water	Dissolved Organic Carbon	APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

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).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
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).

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.

Reference Information

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 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

NH3-WT Water Ammonia, Total as N EPA 350.1
Sample is measured colorimetrically. When sample is turbid a distillation step is required, sample is distilled into a solution of boric acid and measured colorimetrically.

NO2-IC-WT Water Nitrite in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

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).

Reference Information

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

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

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

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

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.

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

Chain of Custody Numbers:

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 weight of sample
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.

Quality Control Report

Workorder: L2077097 Report Date: 25-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Water**							
Batch R4008098								
WG2747235-2 LCS								
1,2,4-Trichlorobenzene			93.6		%		50-140	11-APR-18
2-Chlorophenol			83.5		%		50-140	11-APR-18
2,4-Dichlorophenol			97.5		%		50-140	11-APR-18
2,4-Dimethylphenol			63.1		%		30-130	11-APR-18
2,4-Dinitrophenol			109.1		%		50-140	11-APR-18
2,4-Dinitrotoluene			108.8		%		50-140	11-APR-18
2,4,5-Trichlorophenol			106.4		%		50-140	11-APR-18
2,4,6-Trichlorophenol			100.3		%		50-140	11-APR-18
2,6-Dinitrotoluene			99.2		%		50-140	11-APR-18
3,3'-Dichlorobenzidine			76.8		%		30-130	11-APR-18
4-Chloroaniline			42.5		%		30-130	11-APR-18
Biphenyl			98.7		%		50-140	11-APR-18
Bis(2-chloroethyl)ether			91.6		%		50-140	11-APR-18
Bis(2-chloroisopropyl)ether			92.5		%		50-140	11-APR-18
Bis(2-ethylhexyl)phthalate			120.9		%		50-140	11-APR-18
Diethylphthalate			103.0		%		50-140	11-APR-18
Dimethylphthalate			100.4		%		50-140	11-APR-18
Pentachlorophenol			107.0		%		50-140	11-APR-18
Phenol			48.5		%		30-130	11-APR-18
WG2747235-3 LCSD		**WG2747235-2**						
1,2,4-Trichlorobenzene		93.6	91.0		%	2.8	50	11-APR-18
2-Chlorophenol		83.5	85.0		%	1.7	50	11-APR-18
2,4-Dichlorophenol		97.5	97.8		%	0.3	50	11-APR-18
2,4-Dimethylphenol		63.1	84.5		%	29	50	11-APR-18
2,4-Dinitrophenol		109.1	126.5		%	15	50	11-APR-18
2,4-Dinitrotoluene		108.8	108.7		%	0.0	50	11-APR-18
2,4,5-Trichlorophenol		106.4	106.3		%	0.1	50	11-APR-18
2,4,6-Trichlorophenol		100.3	101.9		%	1.6	50	11-APR-18
2,6-Dinitrotoluene		99.2	102.6		%	3.4	50	11-APR-18
3,3'-Dichlorobenzidine		76.8	83.6		%	8.5	50	11-APR-18
4-Chloroaniline		42.5	40.1		%	5.9	50	11-APR-18
Biphenyl		98.7	97.6		%	1.1	50	11-APR-18
Bis(2-chloroethyl)ether		91.6	90.0		%	1.7	50	11-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Water**							
Batch R4008098								
WG2747235-3 LCSD		**WG2747235-2**						
Bis(2-chloroisopropyl)ether		92.5	92.5		%	0.0	50	11-APR-18
Bis(2-ethylhexyl)phthalate		120.9	116.7		%	3.6	50	11-APR-18
Diethylphthalate		103.0	101.8		%	1.1	50	11-APR-18
Dimethylphthalate		100.4	100.9		%	0.6	50	11-APR-18
Pentachlorophenol		107.0	111.6		%	4.2	50	11-APR-18
Phenol		48.5	48.6		%	0.1	50	11-APR-18
WG2747235-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	11-APR-18
2-Chlorophenol			<0.30		ug/L		0.3	11-APR-18
2,4-Dichlorophenol			<0.30		ug/L		0.3	11-APR-18
2,4-Dimethylphenol			<0.50		ug/L		0.5	11-APR-18
2,4-Dinitrophenol			<1.0		ug/L		1	11-APR-18
2,4-Dinitrotoluene			<0.40		ug/L		0.4	11-APR-18
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	11-APR-18
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	11-APR-18
2,6-Dinitrotoluene			<0.40		ug/L		0.4	11-APR-18
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	11-APR-18
4-Chloroaniline			<0.40		ug/L		0.4	11-APR-18
Biphenyl			<0.40		ug/L		0.4	11-APR-18
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	11-APR-18
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	11-APR-18
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	11-APR-18
Diethylphthalate			<0.20		ug/L		0.2	11-APR-18
Dimethylphthalate			<0.20		ug/L		0.2	11-APR-18
Pentachlorophenol			<0.50		ug/L		0.5	11-APR-18
Phenol			<0.50		ug/L		0.5	11-APR-18
Surrogate: 2-Fluorobiphenyl			93.0		%		50-140	11-APR-18
Surrogate: 2,4,6-Tribromophenol			78.9		%		50-140	11-APR-18
Surrogate: Nitrobenzene d5			90.3		%		50-140	11-APR-18
Surrogate: p-Terphenyl d14			110.6		%		60-140	11-APR-18
Surrogate: Phenol d5			39.7		%		30-130	11-APR-18
ALK-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT	**Water**							
Batch R4008410								
WG2749188-3 CRM		**WT-ALK-CRM**						
Alkalinity, Total (as CaCO3)			100.1		%		80-120	11-APR-18
WG2749188-4 DUP		**L2077055-1**						
Alkalinity, Total (as CaCO3)		310	321		mg/L	3.4	20	11-APR-18
WG2749188-2 LCS								
Alkalinity, Total (as CaCO3)			98.4		%		85-115	11-APR-18
WG2749188-1 MB								
Alkalinity, Total (as CaCO3)			<10		mg/L		10	11-APR-18
C-DIS-ORG-WT	**Water**							
Batch R4007873								
WG2747838-3 DUP		**L2077097-11**						
Dissolved Organic Carbon		7.2	7.7		mg/L	5.9	20	09-APR-18
WG2747838-2 LCS								
Dissolved Organic Carbon			99.4		%		80-120	09-APR-18
WG2747838-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	09-APR-18
WG2747838-4 MS		**L2077097-11**						
Dissolved Organic Carbon			94.2		%		70-130	09-APR-18
CL-IC-N-WT	**Water**							
Batch R4009126								
WG2748899-4 DUP		**WG2748899-3**						
Chloride (Cl)		13.8	13.7		mg/L	0.4	20	11-APR-18
WG2748899-2 LCS								
Chloride (Cl)			100.5		%		90-110	11-APR-18
WG2748899-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	11-APR-18
WG2748899-5 MS		**WG2748899-3**						
Chloride (Cl)			98.3		%		75-125	11-APR-18
CN-WAD-R511-WT	**Water**							
Batch R4008951								
WG2749813-3 DUP		**L2077156-1**						
Cyanide, Weak Acid Diss		<2.0	<2.0	RPD-NA	ug/L	N/A	20	11-APR-18
WG2749813-2 LCS								
Cyanide, Weak Acid Diss			100.8		%		80-120	11-APR-18
WG2749813-1 MB								
Cyanide, Weak Acid Diss			<2.0		ug/L		2	11-APR-18
WG2749813-4 MS		**L2077156-1**						

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT	**Water**							
Batch R4008951								
WG2749813-4 MS		**L2077156-1**						
Cyanide, Weak Acid Diss			102.6		%		70-130	11-APR-18
CR-CR6-IC-R511-WT	**Water**							
Batch R4007515								
WG2747458-10 DUP		**WG2747458-8**						
Chromium, Hexavalent		<1.0	<1.0	RPD-NA	ug/L	N/A	20	09-APR-18
WG2747458-7 LCS								
Chromium, Hexavalent			97.9		%		80-120	09-APR-18
WG2747458-6 MB								
Chromium, Hexavalent			<1.0		ug/L		1	09-APR-18
WG2747458-9 MS		**WG2747458-8**						
Chromium, Hexavalent			99.5		%		70-130	09-APR-18
EC-R511-WT	**Water**							
Batch R4007280								
WG2746819-4 DUP		**WG2746819-3**						
Conductivity		3.96	3.96		mS/cm	0.0	10	07-APR-18
WG2746819-8 DUP		**WG2746819-7**						
Conductivity		1.78	1.77		mS/cm	0.5	10	07-APR-18
WG2746819-2 LCS								
Conductivity			100.7		%		90-110	07-APR-18
WG2746819-6 LCS								
Conductivity			100.5		%		90-110	07-APR-18
WG2746819-1 MB								
Conductivity			<0.0030		mS/cm		0.003	07-APR-18
WG2746819-5 MB								
Conductivity			<0.0030		mS/cm		0.003	07-APR-18
F1-HS-511-WT	**Water**							
Batch R4007413								
WG2746300-4 DUP		**WG2746300-3**						
F1 (C6-C10)		127	125		ug/L	1.6	30	10-APR-18
WG2746300-1 LCS								
F1 (C6-C10)			93.6		%		80-120	09-APR-18
WG2746300-2 MB								
F1 (C6-C10)			<25		ug/L		25	10-APR-18
Surrogate: 3,4-Dichlorotoluene			95.9		%		60-140	10-APR-18
WG2746300-5 MS		**WG2746300-3**						

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	**Water**							
Batch R4007413								
WG2746300-5 MS		**WG2746300-3**						
F1 (C6-C10)			91.1		%		60-140	10-APR-18
F2-F4-511-WT	**Water**							
Batch R4007710								
WG2747290-2 LCS								
F2 (C10-C16)			108.1		%		70-130	10-APR-18
F3 (C16-C34)			119.3		%		70-130	10-APR-18
F4 (C34-C50)			120.4		%		70-130	10-APR-18
WG2747290-3 LCSD		**WG2747290-2**						
F2 (C10-C16)		108.1	117.4		%	8.2	50	10-APR-18
F3 (C16-C34)		119.3	122.9		%	3.0	50	10-APR-18
F4 (C34-C50)		120.4	124.8		%	3.6	50	10-APR-18
WG2747290-1 MB								
F2 (C10-C16)			<100		ug/L		100	10-APR-18
F3 (C16-C34)			<250		ug/L		250	10-APR-18
F4 (C34-C50)			<250		ug/L		250	10-APR-18
Surrogate: 2-Bromobenzotrifluoride			97.4		%		60-140	10-APR-18
HG-D-UG/L-CVAA-WT	**Water**							
Batch R4006952								
WG2747351-3 DUP		**L2077097-1**						
Mercury (Hg)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	09-APR-18
WG2747351-2 LCS								
Mercury (Hg)-Dissolved			88.9		%		80-120	09-APR-18
WG2747351-1 MB								
Mercury (Hg)-Dissolved			<0.010		ug/L		0.01	09-APR-18
WG2747351-4 MS		**L2077097-2**						
Mercury (Hg)-Dissolved			87.8		%		70-130	09-APR-18
MET-D-UG/L-MS-WT	**Water**							
Batch R4007206								
WG2747222-4 DUP		**WG2747222-3**						
Antimony (Sb)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	09-APR-18
Arsenic (As)-Dissolved		0.13	0.15		ug/L	18	20	09-APR-18
Barium (Ba)-Dissolved		58.3	57.1		ug/L	2.1	20	09-APR-18
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	09-APR-18
Boron (B)-Dissolved		43	43		ug/L	0.2	20	09-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4007206								
WG2747222-4 DUP		**WG2747222-3**						
Cadmium (Cd)-Dissolved		0.0700	0.0735		ug/L	4.9	20	09-APR-18
Chromium (Cr)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	09-APR-18
Cobalt (Co)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	09-APR-18
Copper (Cu)-Dissolved		1.26	1.26		ug/L	0.4	20	09-APR-18
Lead (Pb)-Dissolved		0.051	0.052		ug/L	2.6	20	09-APR-18
Molybdenum (Mo)-Dissolved		0.428	0.423		ug/L	1.3	20	09-APR-18
Nickel (Ni)-Dissolved		1.64	1.63		ug/L	0.2	20	09-APR-18
Selenium (Se)-Dissolved		0.420	0.424		ug/L	0.9	20	09-APR-18
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	09-APR-18
Sodium (Na)-Dissolved		173000	174000		ug/L	0.5	20	09-APR-18
Thallium (Tl)-Dissolved		0.053	0.051		ug/L	4.4	20	09-APR-18
Uranium (U)-Dissolved		0.628	0.637		ug/L	1.5	20	09-APR-18
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	09-APR-18
Zinc (Zn)-Dissolved		53.9	53.7		ug/L	0.3	20	09-APR-18
WG2747222-2 LCS								
Antimony (Sb)-Dissolved			99.0		%		80-120	09-APR-18
Arsenic (As)-Dissolved			100.6		%		80-120	09-APR-18
Barium (Ba)-Dissolved			96.9		%		80-120	09-APR-18
Beryllium (Be)-Dissolved			101.5		%		80-120	09-APR-18
Boron (B)-Dissolved			96.5		%		80-120	09-APR-18
Cadmium (Cd)-Dissolved			104.3		%		80-120	09-APR-18
Chromium (Cr)-Dissolved			102.6		%		80-120	09-APR-18
Cobalt (Co)-Dissolved			102.6		%		80-120	09-APR-18
Copper (Cu)-Dissolved			103.4		%		80-120	09-APR-18
Lead (Pb)-Dissolved			103.7		%		80-120	09-APR-18
Molybdenum (Mo)-Dissolved			101.6		%		80-120	09-APR-18
Nickel (Ni)-Dissolved			104.1		%		80-120	09-APR-18
Selenium (Se)-Dissolved			104.9		%		80-120	09-APR-18
Silver (Ag)-Dissolved			101.6		%		80-120	09-APR-18
Sodium (Na)-Dissolved			105.6		%		80-120	09-APR-18
Thallium (Tl)-Dissolved			101.0		%		80-120	09-APR-18
Uranium (U)-Dissolved			113.3		%		80-120	09-APR-18
Vanadium (V)-Dissolved			104.1		%		80-120	09-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4007206								
WG2747222-2 LCS								
Zinc (Zn)-Dissolved			96.8		%		80-120	09-APR-18
WG2747222-1 MB								
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	09-APR-18
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	09-APR-18
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	09-APR-18
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	09-APR-18
Boron (B)-Dissolved			<10		ug/L		10	09-APR-18
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	09-APR-18
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	09-APR-18
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	09-APR-18
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	09-APR-18
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	09-APR-18
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	09-APR-18
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	09-APR-18
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	09-APR-18
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	09-APR-18
Sodium (Na)-Dissolved			<500		ug/L		500	09-APR-18
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	09-APR-18
Uranium (U)-Dissolved			<0.010		ug/L		0.01	09-APR-18
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	09-APR-18
Zinc (Zn)-Dissolved			<1.0		ug/L		1	09-APR-18
WG2747222-5 MS		**WG2747222-6**						
Antimony (Sb)-Dissolved			98.3		%		70-130	09-APR-18
Arsenic (As)-Dissolved			103.1		%		70-130	09-APR-18
Barium (Ba)-Dissolved			N/A	MS-B	%		-	09-APR-18
Beryllium (Be)-Dissolved			97.8		%		70-130	09-APR-18
Boron (B)-Dissolved			89.1		%		70-130	09-APR-18
Cadmium (Cd)-Dissolved			99.6		%		70-130	09-APR-18
Chromium (Cr)-Dissolved			99.5		%		70-130	09-APR-18
Cobalt (Co)-Dissolved			97.7		%		70-130	09-APR-18
Copper (Cu)-Dissolved			95.5		%		70-130	09-APR-18
Lead (Pb)-Dissolved			95.5		%		70-130	09-APR-18
Molybdenum (Mo)-Dissolved			99.9		%		70-130	09-APR-18
Nickel (Ni)-Dissolved			93.9		%		70-130	09-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4007206								
WG2747222-5 MS		**WG2747222-6**						
Selenium (Se)-Dissolved			103.2		%		70-130	09-APR-18
Silver (Ag)-Dissolved			98.1		%		70-130	09-APR-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	09-APR-18
Thallium (Tl)-Dissolved			97.4		%		70-130	09-APR-18
Uranium (U)-Dissolved			N/A	MS-B	%		-	09-APR-18
Vanadium (V)-Dissolved			104.7		%		70-130	09-APR-18
Zinc (Zn)-Dissolved			N/A	MS-B	%		-	09-APR-18
NH3-WT	**Water**							
Batch R4007184								
WG2747742-7 DUP		**L2077097-1**						
Ammonia, Total (as N)		<0.020	0.043	RPD-NA	mg/L	N/A	20	09-APR-18
WG2747742-6 LCS								
Ammonia, Total (as N)			101.6		%		85-115	09-APR-18
WG2747742-5 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	09-APR-18
WG2747742-8 MS		**L2077097-1**						
Ammonia, Total (as N)			82.8		%		75-125	09-APR-18
NO2-IC-WT	**Water**							
Batch R4009126								
WG2748899-4 DUP		**WG2748899-3**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	25	11-APR-18
WG2748899-2 LCS								
Nitrite (as N)			102.1		%		70-130	11-APR-18
WG2748899-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	11-APR-18
WG2748899-5 MS		**WG2748899-3**						
Nitrite (as N)			94.6		%		70-130	11-APR-18
NO3-IC-WT	**Water**							
Batch R4009126								
WG2748899-4 DUP		**WG2748899-3**						
Nitrate (as N)		5.74	5.74		mg/L	0.1	25	11-APR-18
WG2748899-2 LCS								
Nitrate (as N)			100.3		%		70-130	11-APR-18
WG2748899-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	11-APR-18
WG2748899-5 MS		**WG2748899-3**						

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-WT	**Water**							
Batch R4009126								
WG2748899-5 MS		**WG2748899-3**						
Nitrate (as N)			N/A	MS-B	%		-	11-APR-18
P-T-COL-WT	**Water**							
Batch R4008707								
WG2749384-3 DUP		**L2077097-5**						
Phosphorus, Total		0.293	0.284		mg/L	3.3	20	12-APR-18
WG2749384-2 LCS								
Phosphorus, Total			92.5		%		80-120	12-APR-18
WG2749384-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	12-APR-18
WG2749384-4 MS		**L2077097-5**						
Phosphorus, Total			N/A	MS-B	%		-	12-APR-18
PAH-511-WT	**Water**							
Batch R4009214								
WG2747290-2 LCS								
1-Methylnaphthalene			85.3		%		50-140	12-APR-18
2-Methylnaphthalene			82.1		%		50-140	12-APR-18
Acenaphthene			89.0		%		50-140	12-APR-18
Acenaphthylene			91.0		%		50-140	12-APR-18
Anthracene			101.2		%		50-140	12-APR-18
Benzo(a)anthracene			106.8		%		50-140	12-APR-18
Benzo(a)pyrene			94.2		%		50-140	12-APR-18
Benzo(b)fluoranthene			90.3		%		50-140	12-APR-18
Benzo(g,h,i)perylene			93.0		%		50-140	12-APR-18
Benzo(k)fluoranthene			92.1		%		50-140	12-APR-18
Chrysene			95.3		%		50-140	12-APR-18
Dibenzo(ah)anthracene			92.7		%		50-140	12-APR-18
Fluoranthene			97.4		%		50-140	12-APR-18
Fluorene			93.8		%		50-140	12-APR-18
Indeno(1,2,3-cd)pyrene			106.2		%		50-140	12-APR-18
Naphthalene			83.5		%		50-140	12-APR-18
Phenanthrene			98.5		%		50-140	12-APR-18
Pyrene			96.8		%		50-140	12-APR-18
WG2747290-3 LCSD		**WG2747290-2**						
1-Methylnaphthalene		85.3	89.6		%	4.9	50	12-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R4009214								
WG2747290-3 LCSD		**WG2747290-2**						
2-Methylnaphthalene		82.1	86.0		%	4.7	50	12-APR-18
Acenaphthene		89.0	93.0		%	4.4	50	12-APR-18
Acenaphthylene		91.0	94.8		%	4.0	50	12-APR-18
Anthracene		101.2	102.8		%	1.6	50	12-APR-18
Benzo(a)anthracene		106.8	112.7		%	5.4	50	12-APR-18
Benzo(a)pyrene		94.2	98.1		%	4.0	50	12-APR-18
Benzo(b)fluoranthene		90.3	93.5		%	3.5	50	12-APR-18
Benzo(g,h,i)perylene		93.0	100.6		%	7.8	50	12-APR-18
Benzo(k)fluoranthene		92.1	96.9		%	5.1	50	12-APR-18
Chrysene		95.3	104.1		%	8.8	50	12-APR-18
Dibenzo(ah)anthracene		92.7	101.7		%	9.2	50	12-APR-18
Fluoranthene		97.4	101.4		%	4.1	50	12-APR-18
Fluorene		93.8	97.6		%	4.0	50	12-APR-18
Indeno(1,2,3-cd)pyrene		106.2	113.3		%	6.5	50	12-APR-18
Naphthalene		83.5	87.8		%	5.0	50	12-APR-18
Phenanthrene		98.5	100.6		%	2.2	50	12-APR-18
Pyrene		96.8	100.1		%	3.3	50	12-APR-18
WG2747290-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	12-APR-18
2-Methylnaphthalene			<0.020		ug/L		0.02	12-APR-18
Acenaphthene			<0.020		ug/L		0.02	12-APR-18
Acenaphthylene			<0.020		ug/L		0.02	12-APR-18
Anthracene			<0.020		ug/L		0.02	12-APR-18
Benzo(a)anthracene			<0.020		ug/L		0.02	12-APR-18
Benzo(a)pyrene			<0.010		ug/L		0.01	12-APR-18
Benzo(b)fluoranthene			<0.020		ug/L		0.02	12-APR-18
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	12-APR-18
Benzo(k)fluoranthene			<0.020		ug/L		0.02	12-APR-18
Chrysene			<0.020		ug/L		0.02	12-APR-18
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	12-APR-18
Fluoranthene			<0.020		ug/L		0.02	12-APR-18
Fluorene			<0.020		ug/L		0.02	12-APR-18
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	12-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R4009214								
WG2747290-1 MB								
Naphthalene			<0.050		ug/L		0.05	12-APR-18
Phenanthrene			<0.020		ug/L		0.02	12-APR-18
Pyrene			<0.020		ug/L		0.02	12-APR-18
Surrogate: d8-Naphthalene			102.7		%		60-140	12-APR-18
Surrogate: d10-Phenanthrene			103.1		%		60-140	12-APR-18
Surrogate: d12-Chrysene			100.1		%		60-140	12-APR-18
Surrogate: d10-Acenaphthene			100.0		%		60-140	12-APR-18
PH-WT	**Water**							
Batch R4007280								
WG2746819-4 DUP		**WG2746819-3**						
pH		8.12	8.13	J	pH units	0.01	0.2	07-APR-18
WG2746819-8 DUP		**WG2746819-7**						
pH		7.86	7.93	J	pH units	0.07	0.2	07-APR-18
WG2746819-2 LCS								
pH			7.00		pH units		6.9-7.1	07-APR-18
WG2746819-6 LCS								
pH			7.10		pH units		6.9-7.1	07-APR-18
PHENOLS-4AAP-WT	**Water**							
Batch R4007047								
WG2747536-7 DUP		**L2077068-1**						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	09-APR-18
WG2747536-6 LCS								
Phenols (4AAP)			93.6		%		85-115	09-APR-18
WG2747536-5 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	09-APR-18
WG2747536-8 MS		**L2077068-1**						
Phenols (4AAP)			103.8		%		75-125	09-APR-18
SO4-IC-N-WT	**Water**							
Batch R4009126								
WG2748899-4 DUP		**WG2748899-3**						
Sulfate (SO4)		5.34	5.32		mg/L	0.4	20	11-APR-18
WG2748899-2 LCS								
Sulfate (SO4)			101.1		%		90-110	11-APR-18
WG2748899-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	11-APR-18
WG2748899-5 MS		**WG2748899-3**						

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WT	**Water**							
Batch R4009126								
WG2748899-5 MS		**WG2748899-3**						
Sulfate (SO4)			100.5		%		75-125	11-APR-18
TKN-WT	**Water**							
Batch R4008601								
WG2748835-3 DUP		**L2077073-9**						
Total Kjeldahl Nitrogen		7.72	7.57		mg/L	2.0	20	11-APR-18
WG2748835-2 LCS								
Total Kjeldahl Nitrogen			101.2		%		75-125	11-APR-18
WG2748835-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	11-APR-18
WG2748835-4 MS		**L2077073-9**						
Total Kjeldahl Nitrogen			N/A	MS-B	%		-	11-APR-18
VOC-511-HS-WT	**Water**							
Batch R4007413								
WG2746300-4 DUP		**WG2746300-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-APR-18
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	10-APR-18
Benzene		2.82	2.74		ug/L	2.9	30	10-APR-18
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-APR-18
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-APR-18
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-APR-18
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4007413								
WG2746300-4 DUP		**WG2746300-3**						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	10-APR-18
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-APR-18
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-APR-18
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-APR-18
Ethylbenzene		6.31	6.20		ug/L	1.8	30	10-APR-18
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
m+p-Xylenes		8.37	8.13		ug/L	2.9	30	10-APR-18
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-APR-18
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-APR-18
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-APR-18
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-APR-18
o-Xylene		29.1	28.4		ug/L	2.5	30	10-APR-18
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
Toluene		2.74	2.67		ug/L	2.6	30	10-APR-18
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-APR-18
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-APR-18
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-APR-18
WG2746300-1 LCS								
1,1,1,2-Tetrachloroethane			99.6		%		70-130	09-APR-18
1,1,2,2-Tetrachloroethane			96.3		%		70-130	09-APR-18
1,1,1-Trichloroethane			97.8		%		70-130	09-APR-18
1,1,2-Trichloroethane			100.2		%		70-130	09-APR-18
1,1-Dichloroethane			95.5		%		70-130	09-APR-18
1,1-Dichloroethylene			88.7		%		70-130	09-APR-18
1,2-Dibromoethane			99.2		%		70-130	09-APR-18
1,2-Dichlorobenzene			103.0		%		70-130	09-APR-18
1,2-Dichloroethane			96.1		%		70-130	09-APR-18
1,2-Dichloropropane			102.7		%		70-130	09-APR-18
1,3-Dichlorobenzene			104.0		%		70-130	09-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4007413								
WG2746300-1 LCS								
1,4-Dichlorobenzene			105.8		%		70-130	09-APR-18
Acetone			109.3		%		60-140	09-APR-18
Benzene			102.0		%		70-130	09-APR-18
Bromodichloromethane			95.7		%		70-130	09-APR-18
Bromoform			95.6		%		70-130	09-APR-18
Bromomethane			94.9		%		60-140	09-APR-18
Carbon tetrachloride			97.1		%		70-130	09-APR-18
Chlorobenzene			102.7		%		70-130	09-APR-18
Chloroform			99.3		%		70-130	09-APR-18
cis-1,2-Dichloroethylene			100.9		%		70-130	09-APR-18
cis-1,3-Dichloropropene			103.3		%		70-130	09-APR-18
Dibromochloromethane			102.0		%		70-130	09-APR-18
Dichlorodifluoromethane			52.0		%		50-140	09-APR-18
Ethylbenzene			101.8		%		70-130	09-APR-18
n-Hexane			111.1		%		70-130	09-APR-18
m+p-Xylenes			102.9		%		70-130	09-APR-18
Methyl Ethyl Ketone			104.9		%		60-140	09-APR-18
Methyl Isobutyl Ketone			99.3		%		60-140	09-APR-18
Methylene Chloride			100.7		%		70-130	09-APR-18
MTBE			107.4		%		70-130	09-APR-18
o-Xylene			100.5		%		70-130	09-APR-18
Styrene			101.0		%		70-130	09-APR-18
Tetrachloroethylene			104.5		%		70-130	09-APR-18
Toluene			102.5		%		70-130	09-APR-18
trans-1,2-Dichloroethylene			100.1		%		70-130	09-APR-18
trans-1,3-Dichloropropene			100.5		%		70-130	09-APR-18
Trichloroethylene			105.4		%		70-130	09-APR-18
Trichlorofluoromethane			96.8		%		60-140	09-APR-18
Vinyl chloride			89.1		%		60-140	09-APR-18
WG2746300-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	10-APR-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	10-APR-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	10-APR-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	10-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4007413								
WG2746300-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	10-APR-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	10-APR-18
1,2-Dibromoethane			<0.20		ug/L		0.2	10-APR-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	10-APR-18
1,2-Dichloroethane			<0.50		ug/L		0.5	10-APR-18
1,2-Dichloropropane			<0.50		ug/L		0.5	10-APR-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	10-APR-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	10-APR-18
Acetone			<30		ug/L		30	10-APR-18
Benzene			<0.50		ug/L		0.5	10-APR-18
Bromodichloromethane			<2.0		ug/L		2	10-APR-18
Bromoform			<5.0		ug/L		5	10-APR-18
Bromomethane			<0.50		ug/L		0.5	10-APR-18
Carbon tetrachloride			<0.20		ug/L		0.2	10-APR-18
Chlorobenzene			<0.50		ug/L		0.5	10-APR-18
Chloroform			<1.0		ug/L		1	10-APR-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-APR-18
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	10-APR-18
Dibromochloromethane			<2.0		ug/L		2	10-APR-18
Dichlorodifluoromethane			<2.0		ug/L		2	10-APR-18
Ethylbenzene			<0.50		ug/L		0.5	10-APR-18
n-Hexane			<0.50		ug/L		0.5	10-APR-18
m+p-Xylenes			<0.40		ug/L		0.4	10-APR-18
Methyl Ethyl Ketone			<20		ug/L		20	10-APR-18
Methyl Isobutyl Ketone			<20		ug/L		20	10-APR-18
Methylene Chloride			<5.0		ug/L		5	10-APR-18
MTBE			<2.0		ug/L		2	10-APR-18
o-Xylene			<0.30		ug/L		0.3	10-APR-18
Styrene			<0.50		ug/L		0.5	10-APR-18
Tetrachloroethylene			<0.50		ug/L		0.5	10-APR-18
Toluene			<0.50		ug/L		0.5	10-APR-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-APR-18
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	10-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4007413								
WG2746300-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	10-APR-18
Trichlorofluoromethane			<5.0		ug/L		5	10-APR-18
Vinyl chloride			<0.50		ug/L		0.5	10-APR-18
Surrogate: 1,4-Difluorobenzene			102.5		%		70-130	10-APR-18
Surrogate: 4-Bromofluorobenzene			100.8		%		70-130	10-APR-18
WG2746300-5 MS		**WG2746300-3**						
1,1,1,2-Tetrachloroethane			100.2		%		50-140	10-APR-18
1,1,2,2-Tetrachloroethane			98.5		%		50-140	10-APR-18
1,1,1-Trichloroethane			96.4		%		50-140	10-APR-18
1,1,2-Trichloroethane			103.1		%		50-140	10-APR-18
1,1-Dichloroethane			95.6		%		50-140	10-APR-18
1,1-Dichloroethylene			85.8		%		50-140	10-APR-18
1,2-Dibromoethane			103.1		%		50-140	10-APR-18
1,2-Dichlorobenzene			102.7		%		50-140	10-APR-18
1,2-Dichloroethane			99.6		%		50-140	10-APR-18
1,2-Dichloropropane			104.7		%		50-140	10-APR-18
1,3-Dichlorobenzene			102.2		%		50-140	10-APR-18
1,4-Dichlorobenzene			103.8		%		50-140	10-APR-18
Acetone			113.0		%		50-140	10-APR-18
Benzene			102.0		%		50-140	10-APR-18
Bromodichloromethane			97.2		%		50-140	10-APR-18
Bromoform			98.2		%		50-140	10-APR-18
Bromomethane			90.7		%		50-140	10-APR-18
Carbon tetrachloride			95.0		%		50-140	10-APR-18
Chlorobenzene			101.9		%		50-140	10-APR-18
Chloroform			100.3		%		50-140	10-APR-18
cis-1,2-Dichloroethylene			101.7		%		50-140	10-APR-18
cis-1,3-Dichloropropene			104.0		%		50-140	10-APR-18
Dibromochloromethane			103.9		%		50-140	10-APR-18
Dichlorodifluoromethane			45.1	MES	%		50-140	10-APR-18
Ethylbenzene			98.9		%		50-140	10-APR-18
n-Hexane			104.7		%		50-140	10-APR-18
m+p-Xylenes			100.5		%		50-140	10-APR-18
Methyl Ethyl Ketone			111.1		%		50-140	10-APR-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4007413								
WG2746300-5 MS		**WG2746300-3**						
Methyl Isobutyl Ketone			104.9		%		50-140	10-APR-18
Methylene Chloride			102.1		%		50-140	10-APR-18
MTBE			107.0		%		50-140	10-APR-18
o-Xylene			99.2		%		50-140	10-APR-18
Styrene			99.9		%		50-140	10-APR-18
Tetrachloroethylene			99.7		%		50-140	10-APR-18
Toluene			100.4		%		50-140	10-APR-18
trans-1,2-Dichloroethylene			97.4		%		50-140	10-APR-18
trans-1,3-Dichloropropene			102.7		%		50-140	10-APR-18
Trichloroethylene			103.6		%		50-140	10-APR-18
Trichlorofluoromethane			91.7		%		50-140	10-APR-18
Vinyl chloride			83.0		%		50-140	10-APR-18

Quality Control Report

Workorder: L2077097 Report Date: 25-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

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.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
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.

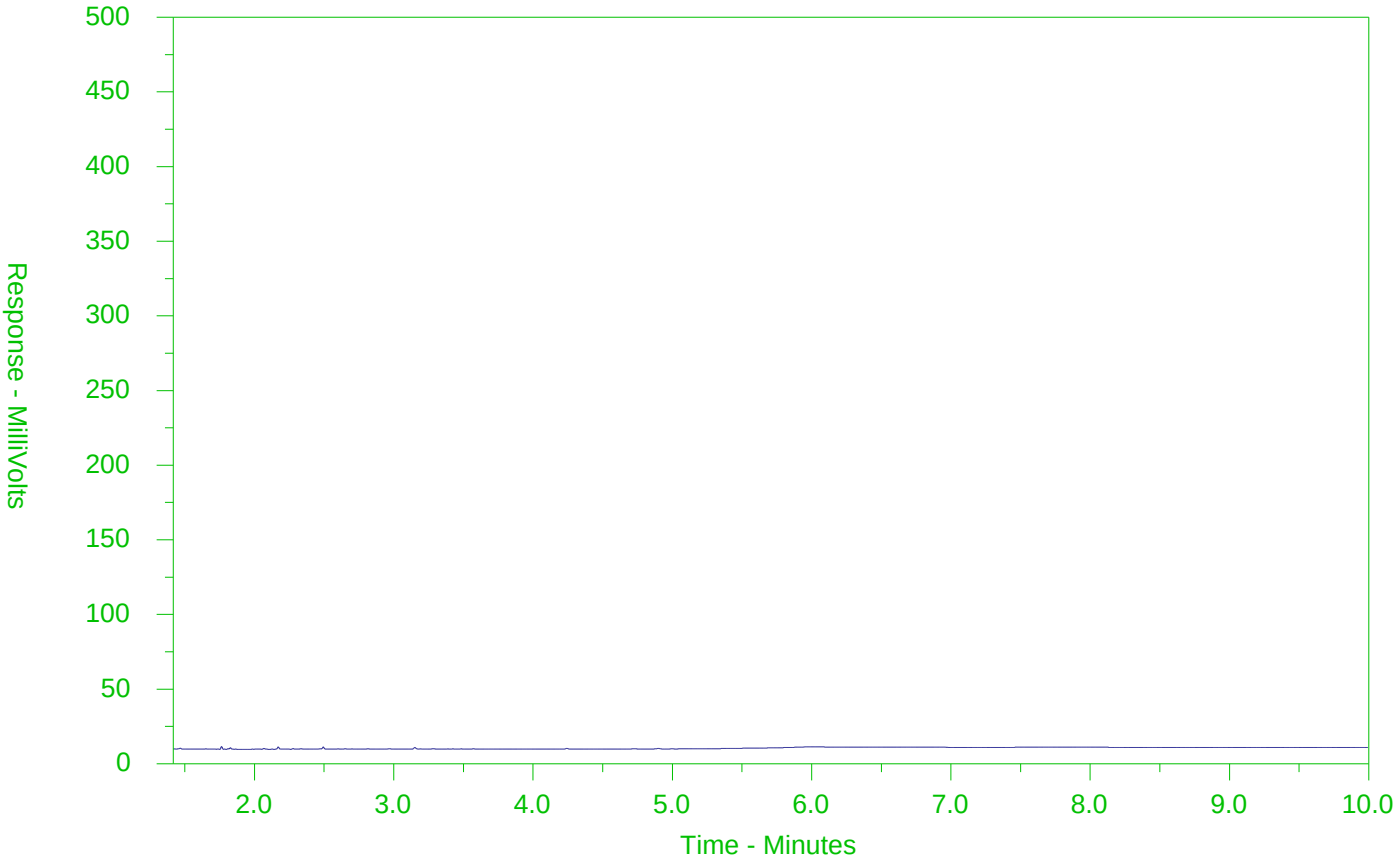
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where 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: L2077097-1
Client Sample ID: GW-11149990-040518-001



←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.

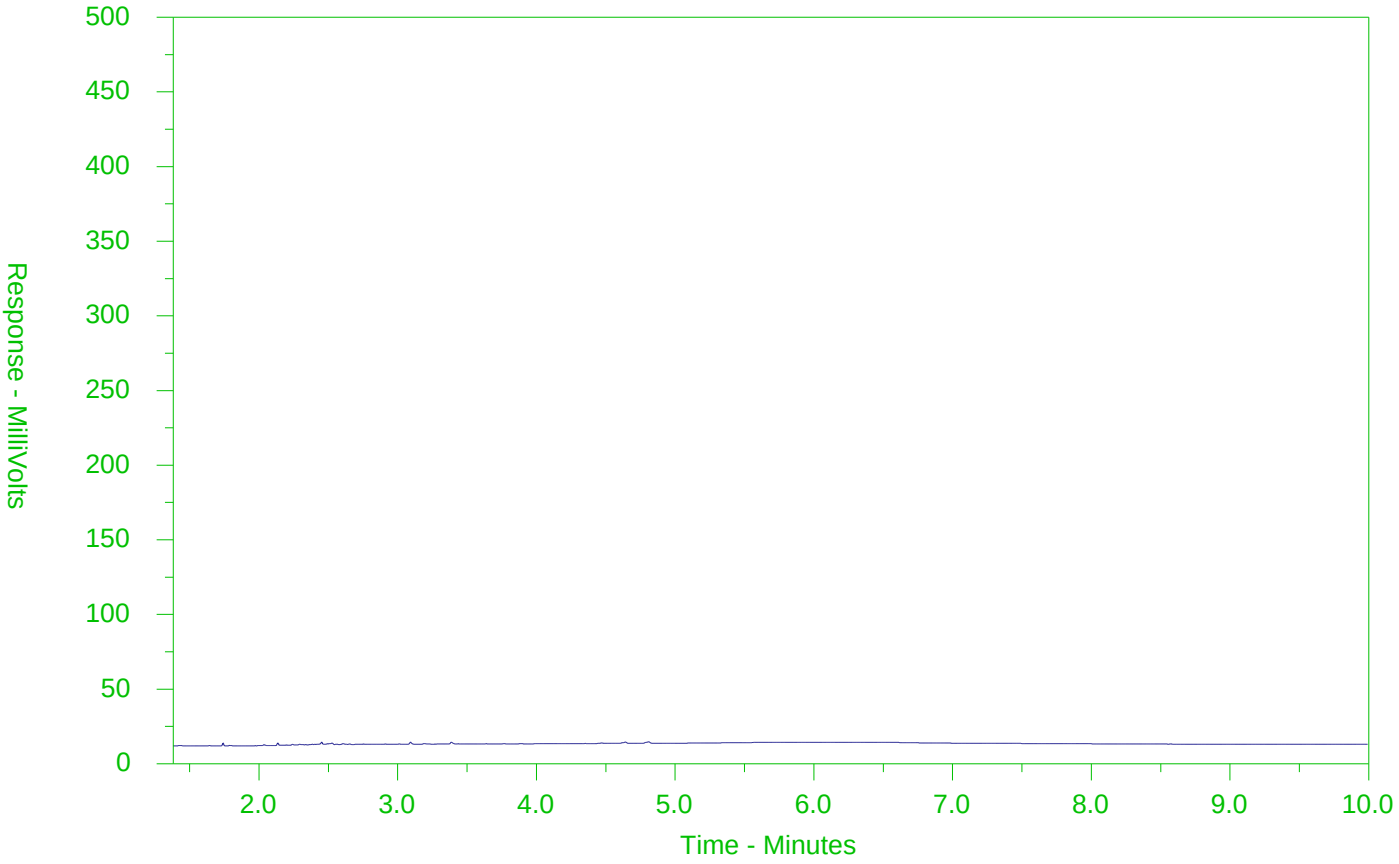
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-2
Client Sample ID: GW-11149990-040518-002



←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.

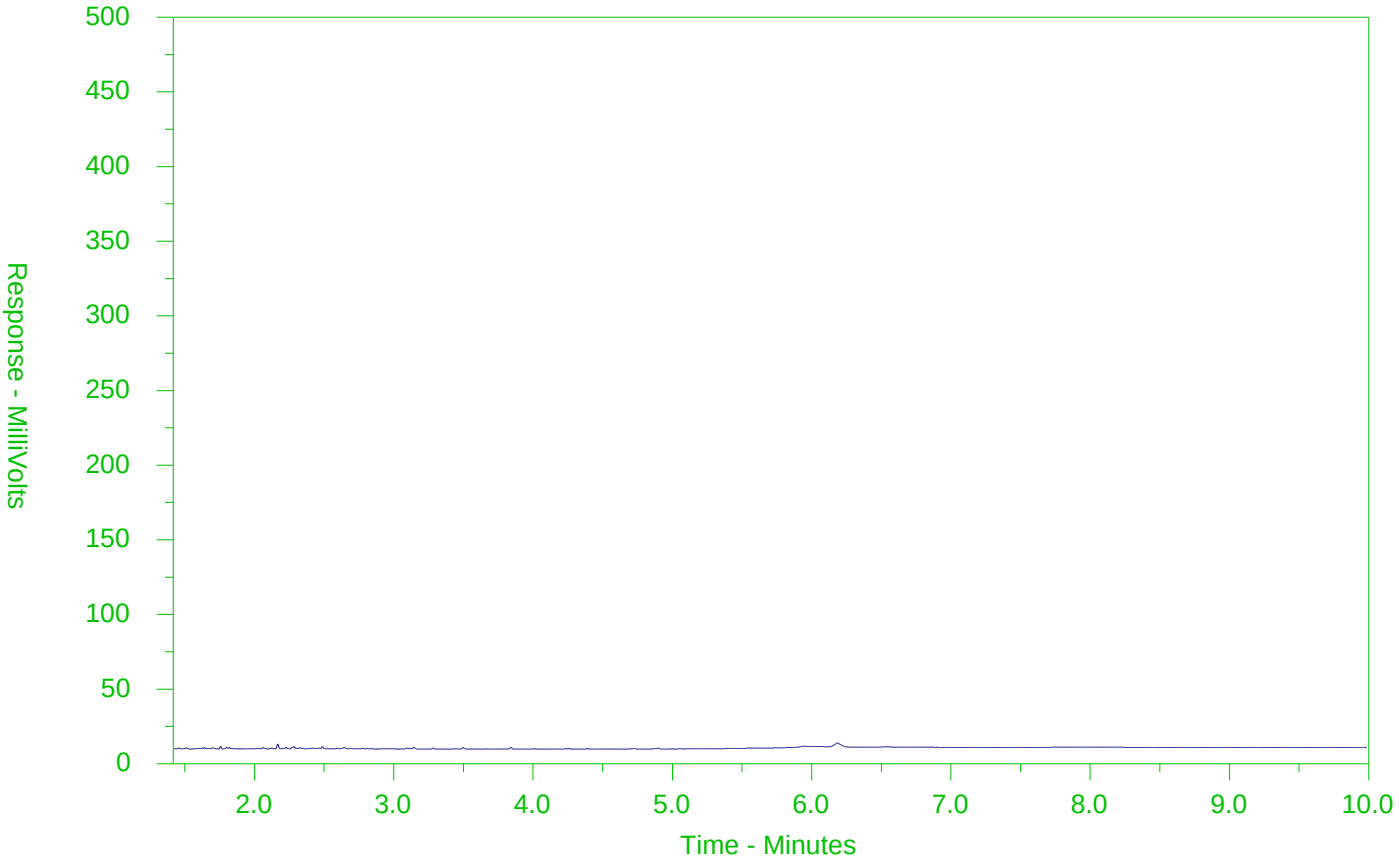
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-3
Client Sample ID: GW-11149990-040518-003



←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.

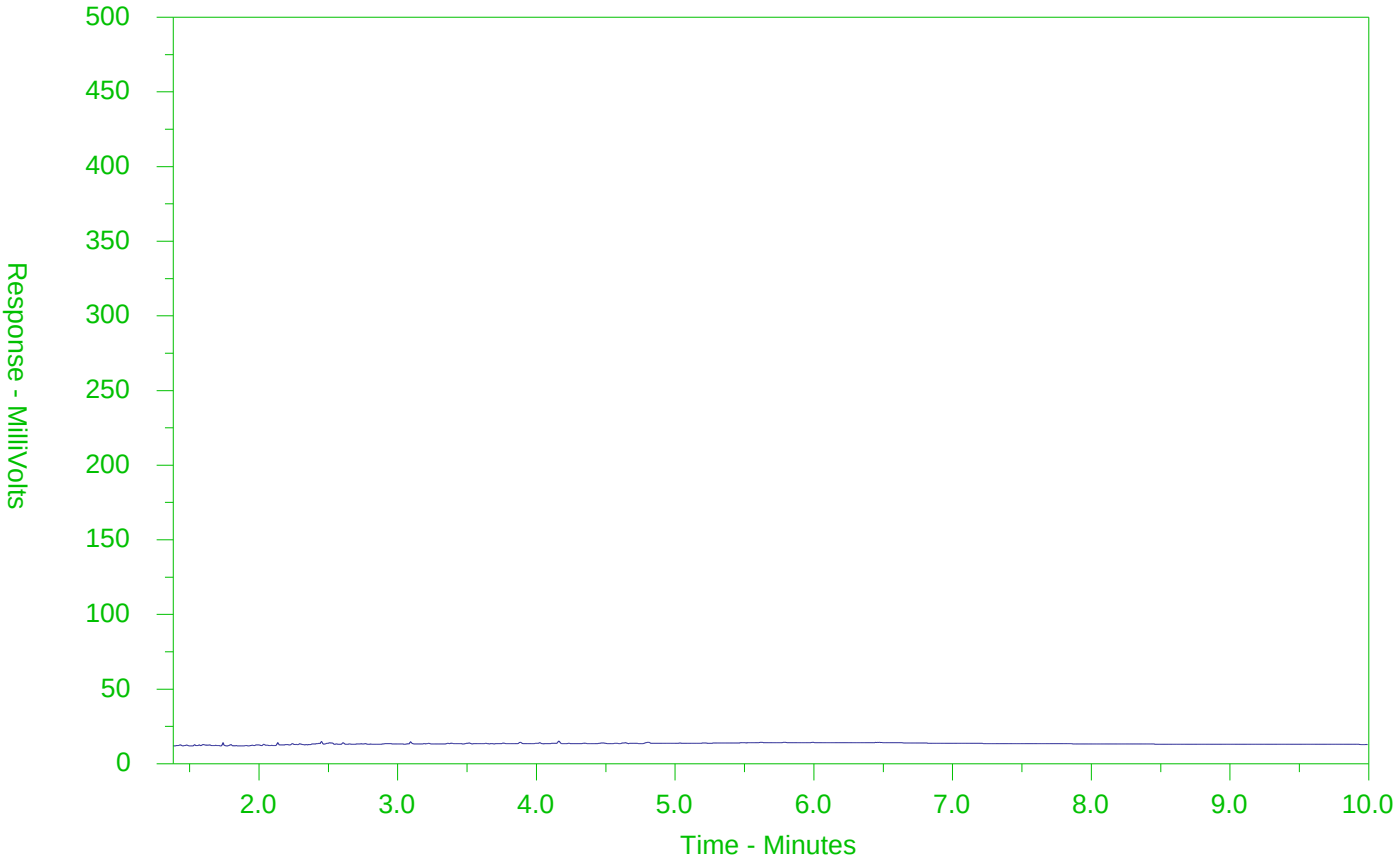
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-4
Client Sample ID: GW-11149990-040518-004



←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.

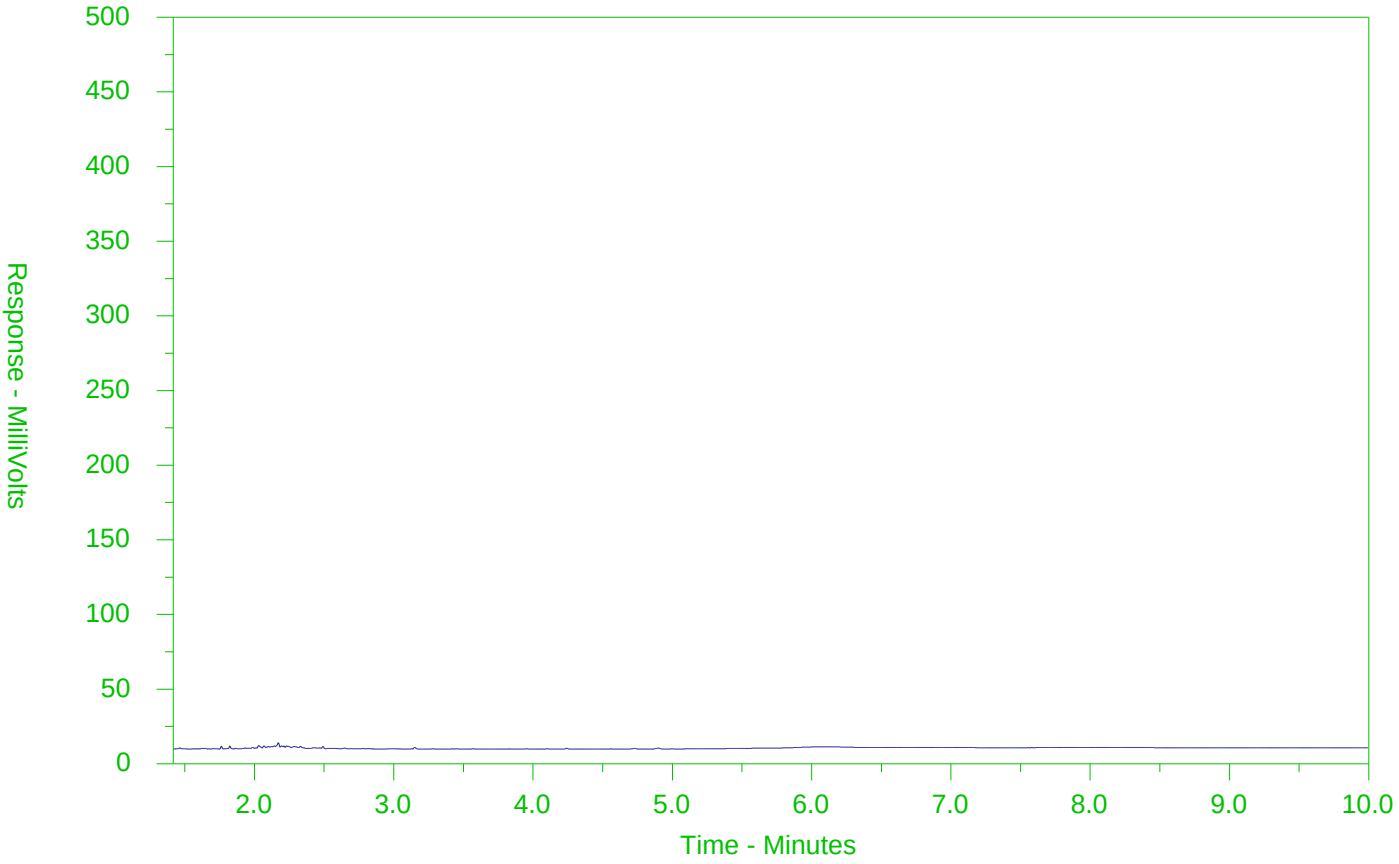
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-5
Client Sample ID: GW-11149990-040518-005



←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.

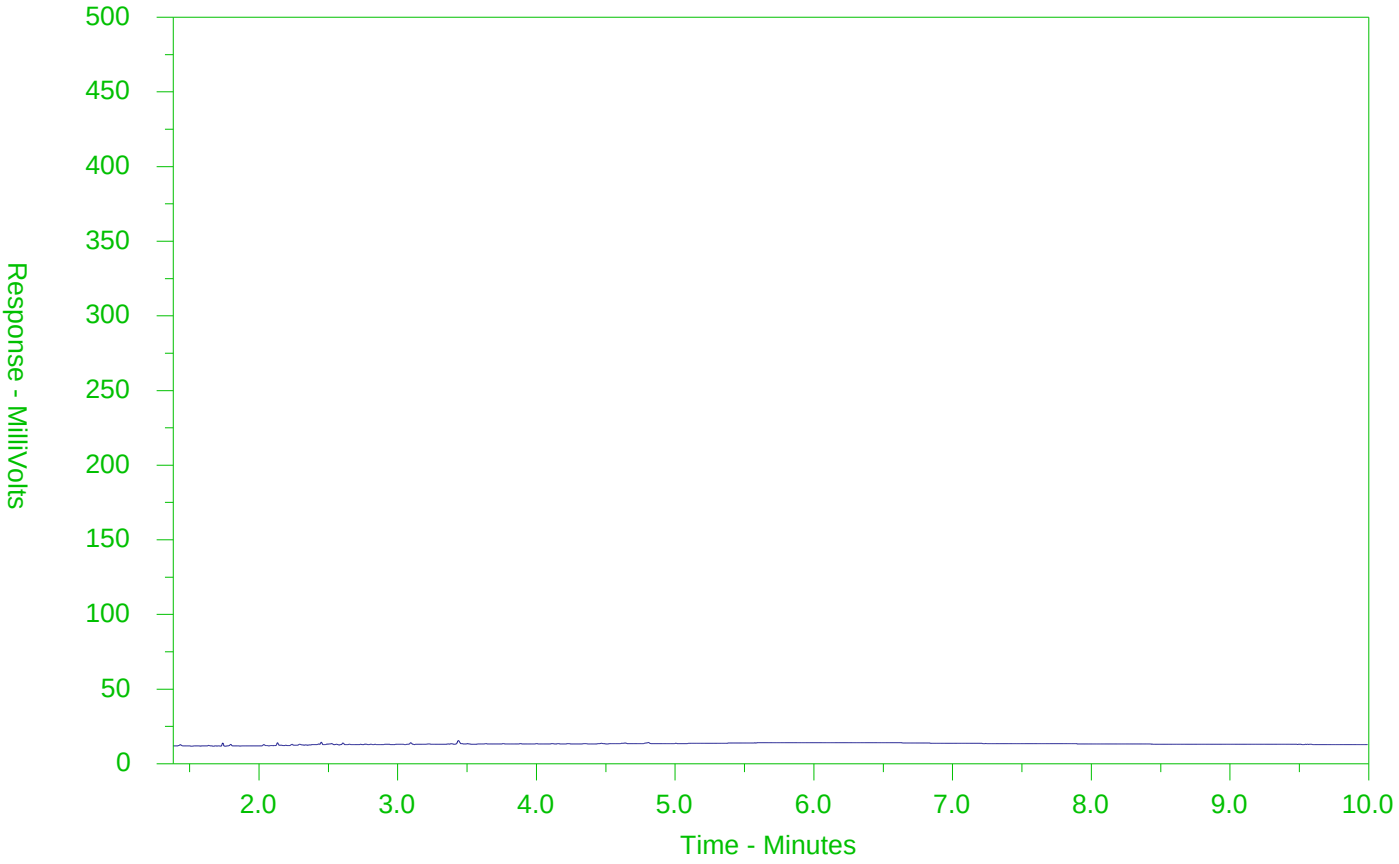
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-6
Client Sample ID: GW-11149990-040618-006



←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.

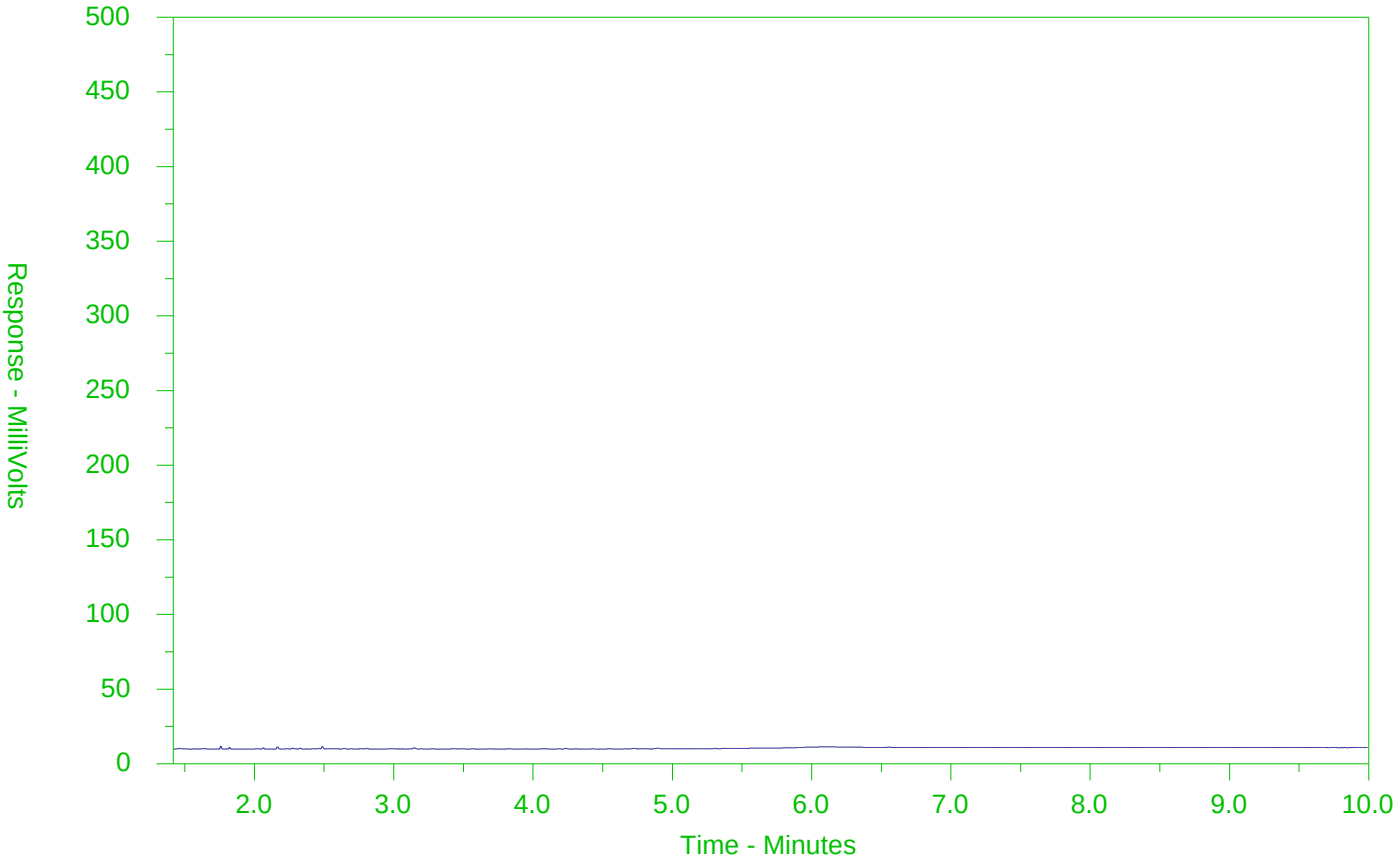
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-7
Client Sample ID: GW-11149990-040618-007



←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.

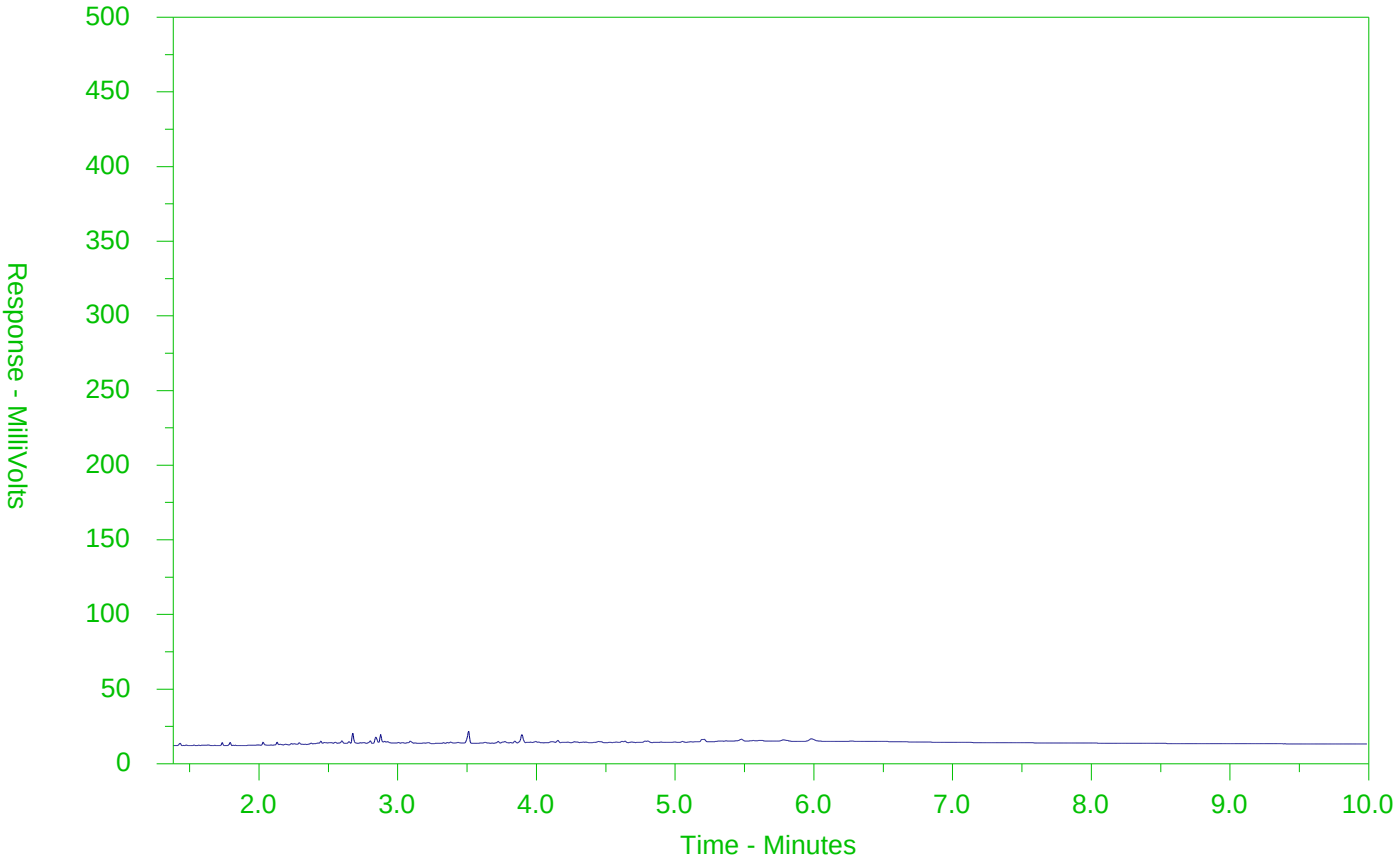
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-8
Client Sample ID: GW-11149990-040618-008



←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.

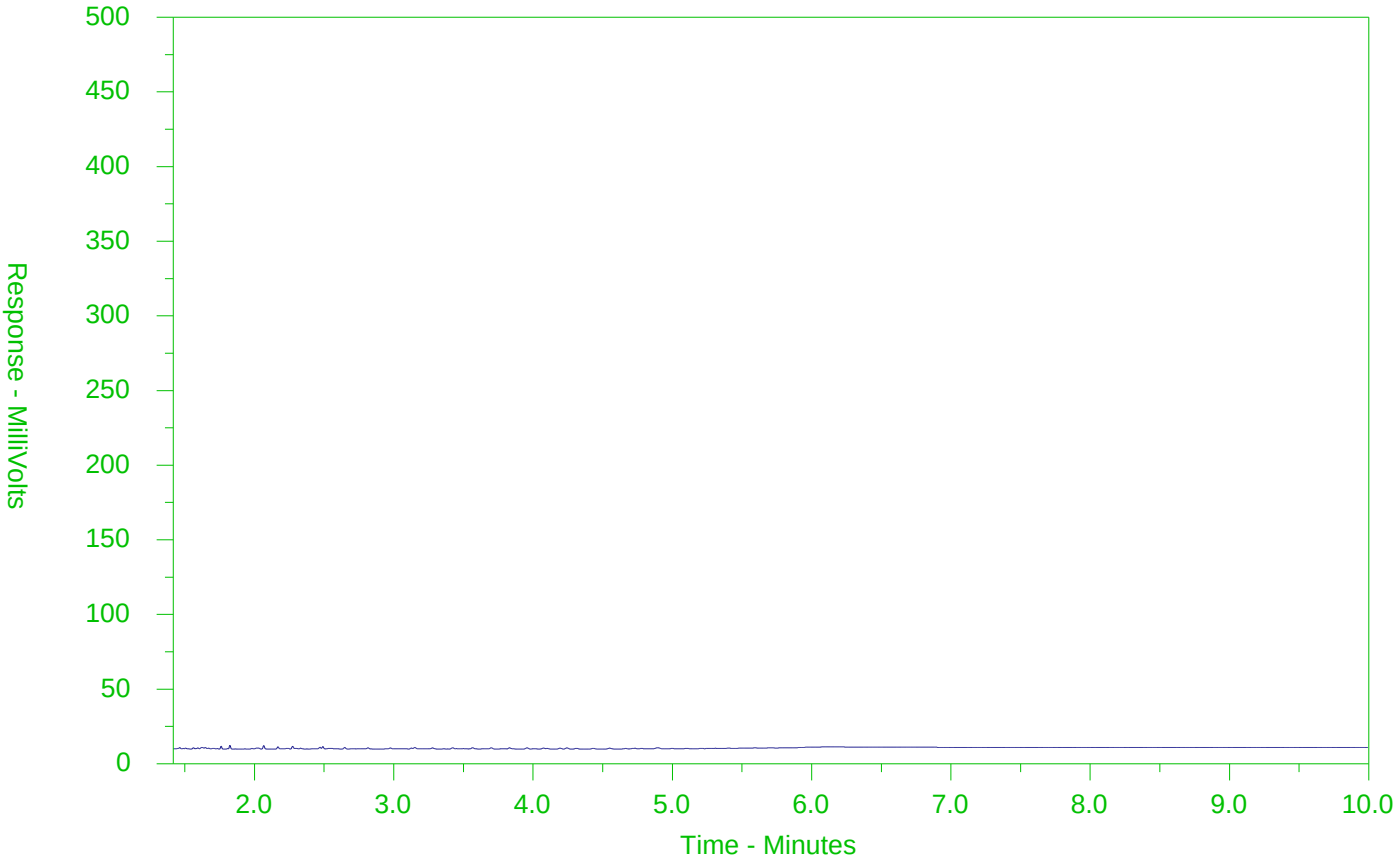
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-9
Client Sample ID: GW-11149990-040618-009



←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.

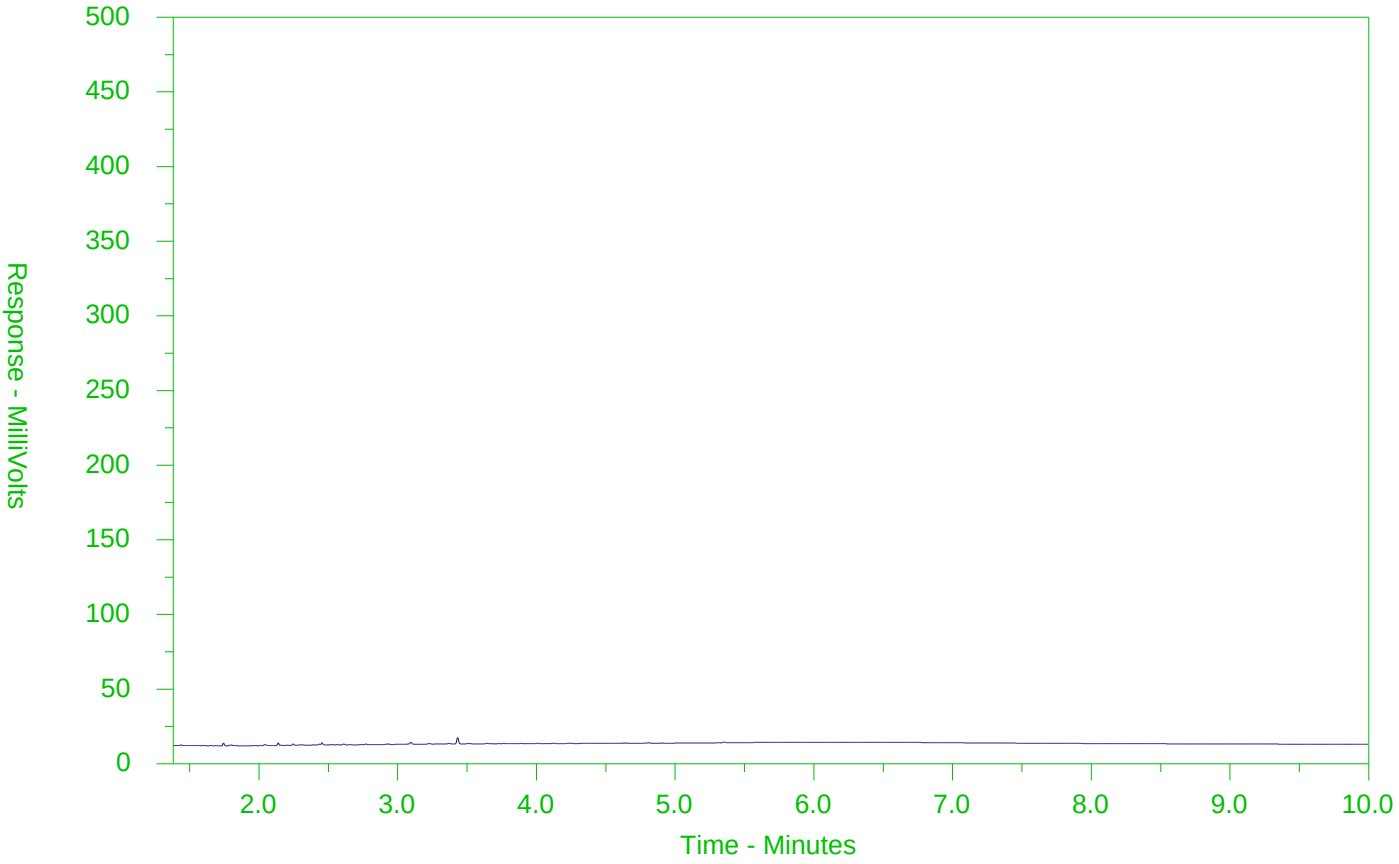
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-10
Client Sample ID: GW-11149990-040618-010



←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.

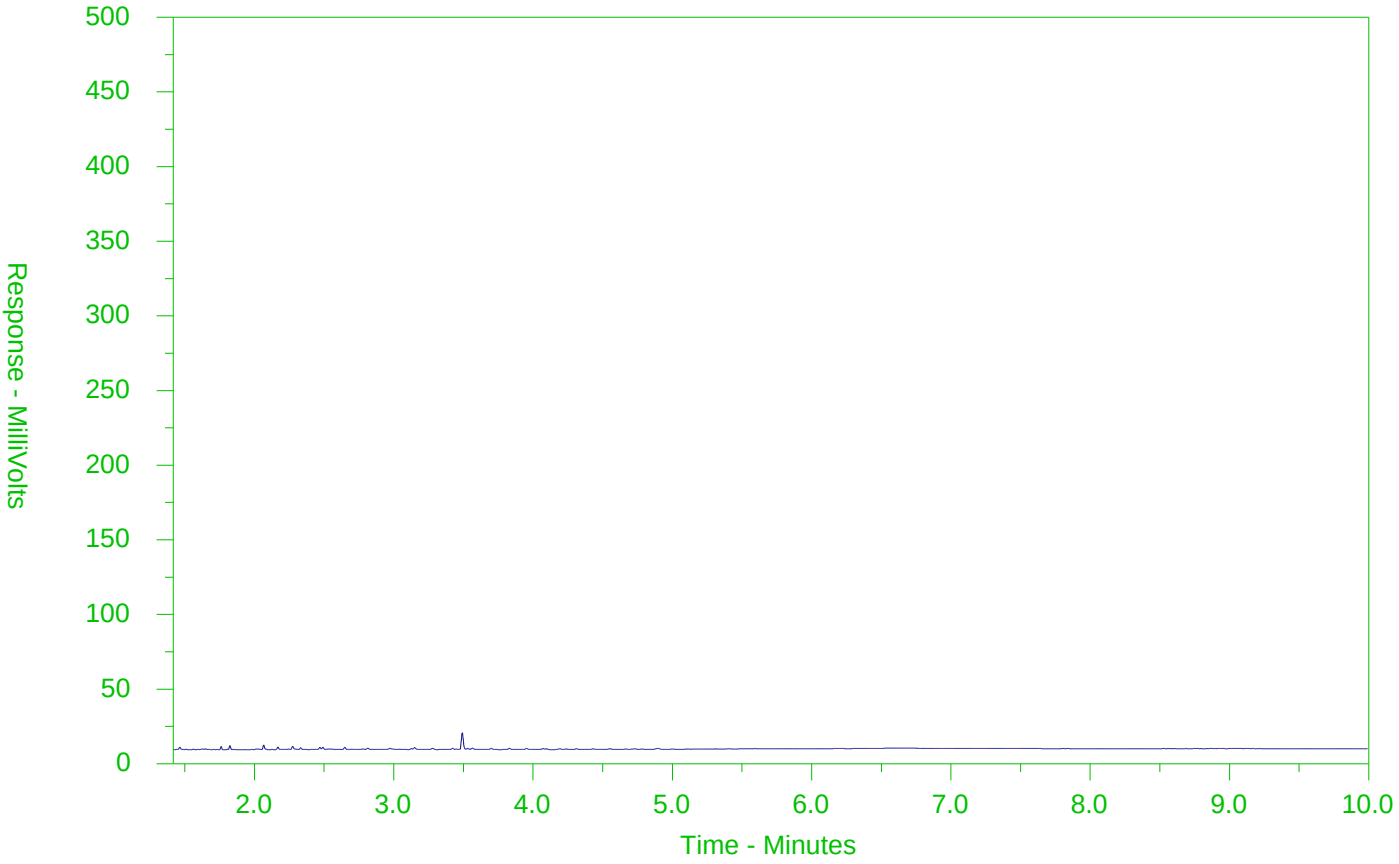
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2077097-11
Client Sample ID: GW-11149990-040618-011



←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

L2077097-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report		Report Format / Distribution	
Company:	GHD LIMITED	Acct# 13791	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	
Contact:	Jennifer Balkwill		Quality Control (QC) Report with Report ☑ YES ☐ NO	
Phone:	519-884-0510		☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report		Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Street:	651 Colby Drive		Email 1 or Fax	Jennifer.Balkwill@ghd.com
City/Province:	Waterloo / Ontario		Email 2	See PO
Postal Code:	N2V 1C2		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:	GHD LIMITED		Email 1 or Fax	Jennifer.Balkwill@ghd.com
Contact:	Jennifer Balkwill		Email 2	
Project Information			Oil and Gas Required Fields (client use)	
ALS Quote#:			AFE/Cost Center:	PO#
Job #:	11149990-04		Major/Minor Code:	Routing Code:
PO / AFE:	73511036		Requisitioner:	
LSD:			Location:	
ALS Lab Work Order # (lab use only)	L2077097 06 08		ALS Contact: Rick H	Sampler: T. Wittmaier

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R]	☒ Standard TAT if received by 3 pm - business days - no surcharges apply			
PRIORITY (Business Days)	4 day [P4] ☐	EMERGENCY	1 Business day [E1]	☐
	3 day [P3] ☐		Same Day, Weekend or Statutory holiday [E0]	☐
	2 day [P2] ☐			
Date and Time Required for all E&P TATs:				

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

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	VOC,F1-F4	SVOCs	153 M&I pkg	Phenols-4AAP	ALK	TKN,TP	DOC	NH3	Anions3 (N2N3,SO4)	VOC,F1 (Trip Blank)				Number of Containers
1	GW-11149990-04 05 18[redacted]-001	05-APR-18	15:35	Water	X	X	X	X	X	X	X	X	X					15
2	GW-11149990-04 05 18[redacted]-002	↓	15:35	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
3	GW-11149990-04 05 18[redacted]-003	↓	17:25	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
4	GW-11149990-04 05 18[redacted]-004	↓	18:25	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
5	GW-11149990-04 05 18[redacted]-005	↓	18:50	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
6	GW-11149990-04 06 18[redacted]-006	06-APR-18	9:45	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
7	GW-11149990-04 06 18[redacted]-007	↓	11:00	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
8	GW-11149990-04 06 18[redacted]-008	↓	12:40	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
9	GW-11149990-04 06 18[redacted]-009	↓	13:50	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
10	GW-11149990-04 06 18[redacted]-010	↓	15:10	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
11	GW-11149990-04 06 18[redacted]-011	↓	19:55	Water	↓	↓	↓	↓	↓	↓	↓	↓	↓					↓
12.	TB [redacted]-11149990-04 05 18[redacted] 001	05-APR-18	~	Water										X				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	metals, CrVI, mercury, DOC all field filtered
Are samples for human drinking water 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			
			2.6	2.3	1.9	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Tyler Wittmaier	Date: 6-Apr-2018	Time: 18:00	Received by:	Date:	Time:	Received by: WS	Date: April 06/18	Time: 18:00

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 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.

VOC-383

GHD Limited (Waterloo)
ATTN: JENNIFER BALKWILL
651 COLBY DRIVE
WATERLOO ON N2V 1C2

Date Received: 08-MAY-18
Report Date: 25-JUL-18 19:00 (MT)
Version: FINAL REV. 5

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2091162

Project P.O. #: 73511036-2
Job Reference: 11149990-04
C of C Numbers: 17-618892, 17-622445
Legal Site Desc:

Comments: ADDITIONAL 11-JUN-18 10:05
ADDITIONAL 11-JUN-18 09:48
ADDITIONAL 04-JUN-18 14:40
ADDITIONAL 16-MAY-18 15:59

Report #1 Split

Rick Hawthorne
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-1 TB-11149990-050118-TW-01 Sampled By: TYLER W. on 01-MAY-18 Matrix: SOIL							
Physical Tests							
% Moisture	<0.10		0.10	%	10-MAY-18	11-MAY-18	R4040337
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
Benzene	<0.0068		0.0068	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromodichloromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromoform	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromomethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Carbon tetrachloride	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Chlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Dibromochloromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Chloroform	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dibromoethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,3-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,4-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Dichlorodifluoromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Methylene Chloride	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichloropropane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-MAY-18	
Ethylbenzene	<0.018		0.018	ug/g	09-MAY-18	11-MAY-18	R4039955
n-Hexane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Methyl Ethyl Ketone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
MTBE	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Styrene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Tetrachloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Toluene	<0.080		0.080	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,1-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,2-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Trichloroethylene	<0.010		0.010	ug/g	09-MAY-18	11-MAY-18	R4039955
Trichlorofluoromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Vinyl chloride	<0.020		0.020	ug/g	09-MAY-18	11-MAY-18	R4039955

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-1 TB-11149990-050118-TW-01 Sampled By: TYLER W. on 01-MAY-18 Matrix: SOIL							
Volatile Organic Compounds							
o-Xylene	<0.020		0.020	ug/g	09-MAY-18	11-MAY-18	R4039955
m+p-Xylenes	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
Xylenes (Total)	<0.050		0.050	ug/g		11-MAY-18	
Surrogate: 4-Bromofluorobenzene	96.7		50-140	%	09-MAY-18	11-MAY-18	R4039955
Surrogate: 1,4-Difluorobenzene	110.0		50-140	%	09-MAY-18	11-MAY-18	R4039955
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	09-MAY-18	11-MAY-18	R4039955
Surrogate: 3,4-Dichlorotoluene	94.7		60-140	%	09-MAY-18	11-MAY-18	R4039955
L2091162-9 S-11149990-050318-TW-08 Sampled By: TYLER W. on 03-MAY-18 @ 08:30 Matrix: SOIL							
Physical Tests							
Conductivity	0.304		0.0040	mS/cm		14-MAY-18	R4043686
% Moisture	14.9		0.10	%	10-MAY-18	10-MAY-18	R4040332
pH	7.31		0.10	pH units		11-MAY-18	R4040674
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	10-MAY-18	11-MAY-18	R4041545
Saturated Paste Extractables							
SAR	0.51		0.10	SAR		14-MAY-18	R4044158
Calcium (Ca)	29.4		1.0	mg/L		14-MAY-18	R4044158
Magnesium (Mg)	2.2		1.0	mg/L		14-MAY-18	R4044158
Sodium (Na)	10.7		1.0	mg/L		14-MAY-18	R4044158
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Arsenic (As)	5.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Barium (Ba)	61.7		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Beryllium (Be)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Boron (B)	10.1		5.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Boron (B), Hot Water Ext.	1.10		0.10	ug/g	11-MAY-18	14-MAY-18	R4044369
Cadmium (Cd)	1.45		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Chromium (Cr)	12.9		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Cobalt (Co)	3.8		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Copper (Cu)	35.1		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Lead (Pb)	52.4		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Mercury (Hg)	0.366		0.0050	ug/g	11-MAY-18	11-MAY-18	R4040544
Molybdenum (Mo)	1.3		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Nickel (Ni)	39.4		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Selenium (Se)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Silver (Ag)	<0.20		0.20	ug/g	11-MAY-18	11-MAY-18	R4042972
Thallium (Tl)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Uranium (U)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Vanadium (V)	14.3		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-9 S-11149990-050318-TW-08 Sampled By: TYLER W. on 03-MAY-18 @ 08:30 Matrix: SOIL							
Metals							
Zinc (Zn)	558		5.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Speciated Metals							
Chromium, Hexavalent	<0.20		0.20	ug/g	10-MAY-18	14-MAY-18	R4042953
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	09-MAY-18	10-MAY-18	R4039969
Benzene	<0.0068		0.0068	ug/g	09-MAY-18	10-MAY-18	R4039969
Bromodichloromethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Bromoform	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Bromomethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Carbon tetrachloride	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Chlorobenzene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Dibromochloromethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Chloroform	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,2-Dibromoethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,2-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,3-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,4-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Dichlorodifluoromethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,1-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,2-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,1-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Methylene Chloride	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,2-Dichloropropane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	10-MAY-18	R4039969
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	10-MAY-18	R4039969
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-MAY-18	
Ethylbenzene	<0.018		0.018	ug/g	09-MAY-18	10-MAY-18	R4039969
n-Hexane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Methyl Ethyl Ketone	<0.50		0.50	ug/g	09-MAY-18	10-MAY-18	R4039969
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	09-MAY-18	10-MAY-18	R4039969
MTBE	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Styrene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Tetrachloroethylene	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Toluene	<0.080		0.080	ug/g	09-MAY-18	10-MAY-18	R4039969
1,1,1-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
1,1,2-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Trichloroethylene	<0.010		0.010	ug/g	09-MAY-18	10-MAY-18	R4039969

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-9 S-11149990-050318-TW-08 Sampled By: TYLER W. on 03-MAY-18 @ 08:30 Matrix: SOIL							
Volatile Organic Compounds							
Trichlorofluoromethane	<0.050		0.050	ug/g	09-MAY-18	10-MAY-18	R4039969
Vinyl chloride	<0.020		0.020	ug/g	09-MAY-18	10-MAY-18	R4039969
o-Xylene	<0.020		0.020	ug/g	09-MAY-18	10-MAY-18	R4039969
m+p-Xylenes	<0.030		0.030	ug/g	09-MAY-18	10-MAY-18	R4039969
Xylenes (Total)	<0.050		0.050	ug/g		11-MAY-18	
Surrogate: 4-Bromofluorobenzene	96.9		50-140	%	09-MAY-18	10-MAY-18	R4039969
Surrogate: 1,4-Difluorobenzene	99.4		50-140	%	09-MAY-18	10-MAY-18	R4039969
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	09-MAY-18	10-MAY-18	R4039969
F1-BTEX	<5.0		5.0	ug/g		11-MAY-18	
F2 (C10-C16)	<10		10	ug/g	10-MAY-18	11-MAY-18	R4040894
F2-Naphth	<10		10	ug/g		11-MAY-18	
F3 (C16-C34)	125		50	ug/g	10-MAY-18	11-MAY-18	R4040894
F3-PAH	122		50	ug/g		11-MAY-18	
F4 (C34-C50)	117		50	ug/g	10-MAY-18	11-MAY-18	R4040894
F4G-SG (GHH-Silica)	500		250	ug/g	11-MAY-18	11-MAY-18	R4042528
Total Hydrocarbons (C6-C50)	242		72	ug/g		11-MAY-18	
Chrom. to baseline at nC50	NO				10-MAY-18	11-MAY-18	R4040894
Surrogate: 2-Bromobenzotrifluoride	91.5		60-140	%	10-MAY-18	11-MAY-18	R4040894
Surrogate: 3,4-Dichlorotoluene	103.2		60-140	%	09-MAY-18	10-MAY-18	R4039969
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	0.085		0.042	ug/g		11-MAY-18	
Semi-Volatile Organics							
Acenaphthene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Acenaphthylene	0.135		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Anthracene	0.098		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(a)anthracene	0.276	R	0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(a)pyrene	0.413		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(b)fluoranthene	0.316		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(ghi)perylene	0.274		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(k)fluoranthene	0.356		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Biphenyl	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
4-Chloroaniline	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Bis(2-chloroethyl)ether	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Bis(2-chloroisopropyl)ether	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2-Chlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Chrysene	0.259		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Dibenzo(a,h)anthracene	0.053		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
3,3'-Dichlorobenzidine	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Diethylphthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Dimethylphthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-9 S-11149990-050318-TW-08 Sampled By: TYLER W. on 03-MAY-18 @ 08:30 Matrix: SOIL							
Semi-Volatile Organics							
2,4-Dimethylphenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dinitrophenol	<1.0		1.0	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dinitrotoluene	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,6-Dinitrotoluene	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4+2,6-Dinitrotoluene	<0.14		0.14	ug/g		11-MAY-18	
Bis(2-ethylhexyl)phthalate	<0.30	DLQ	0.30	ug/g	09-MAY-18	11-MAY-18	R4040412
Fluoranthene	0.348		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Fluorene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Indeno(1,2,3-cd)pyrene	0.317		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
1-Methylnaphthalene	0.036		0.030	ug/g	09-MAY-18	11-MAY-18	R4040412
2-Methylnaphthalene	0.049		0.030	ug/g	09-MAY-18	11-MAY-18	R4040412
Naphthalene	0.063		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Pentachlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Phenanthrene	0.281		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Phenol	0.29		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Pyrene	0.319		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
1,2,4-Trichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4,5-Trichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4,6-Trichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Surrogate: 2-Fluorobiphenyl	91.7		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: Nitrobenzene d5	99.9		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: Phenol d5	91.4		30-130	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: p-Terphenyl d14	79.9		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: 2,4,6-Tribromophenol	96.5		50-140	%	09-MAY-18	11-MAY-18	R4040412
Polychlorinated Biphenyls							
Aroclor 1242	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1248	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1254	0.016	PRAR	0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1260	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Total PCBs	<0.020		0.020	ug/g	16-MAY-18	16-MAY-18	R4045150
Surrogate: d14-Terphenyl	108.8		60-140	%	16-MAY-18	16-MAY-18	R4045150
L2091162-10 S-11149990-050318-TW-09 Sampled By: TYLER W. on 03-MAY-18 @ 08:40 Matrix: SOIL							
Physical Tests							
% Moisture	13.0		0.10	%	05-JUN-18	05-JUN-18	R4071533
Metals							
Cadmium (Cd)	0.77		0.50	ug/g	06-JUN-18	06-JUN-18	R4074941
Mercury (Hg)	0.181		0.0050	ug/g	06-JUN-18	06-JUN-18	R4072393
Zinc (Zn)	336		5.0	ug/g	06-JUN-18	06-JUN-18	R4074941
Polycyclic Aromatic Hydrocarbons							
Benzo(a)pyrene	0.142		0.020	mg/kg	05-JUN-18	08-JUN-18	R4075182

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-10 S-11149990-050318-TW-09 Sampled By: TYLER W. on 03-MAY-18 @ 08:40 Matrix: SOIL							
Polycyclic Aromatic Hydrocarbons							
Surrogate: 2-Fluorobiphenyl	89.2		50-140	%	05-JUN-18	08-JUN-18	R4075182
Surrogate: p-Terphenyl d14	91.5		50-140	%	05-JUN-18	08-JUN-18	R4075182
L2091162-11 S-11149990-050318-TW-10 Sampled By: TYLER W. on 03-MAY-18 @ 14:15 Matrix: SOIL							
Physical Tests							
Conductivity	1.29		0.0040	mS/cm		14-MAY-18	R4043686
% Moisture	14.7		0.10	%	10-MAY-18	10-MAY-18	R4040332
pH	7.40		0.10	pH units		11-MAY-18	R4040674
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	10-MAY-18	11-MAY-18	R4041545
Saturated Paste Extractables							
SAR	22.6	SAR:M	0.10	SAR		14-MAY-18	R4044158
Calcium (Ca)	6.9		1.0	mg/L		14-MAY-18	R4044158
Magnesium (Mg)	<1.0		1.0	mg/L		14-MAY-18	R4044158
Sodium (Na)	216		1.0	mg/L		14-MAY-18	R4044158
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Arsenic (As)	3.5		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Barium (Ba)	43.1		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Beryllium (Be)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Boron (B)	7.8		5.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Boron (B), Hot Water Ext.	0.27		0.10	ug/g	11-MAY-18	14-MAY-18	R4044369
Cadmium (Cd)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Chromium (Cr)	13.7		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Cobalt (Co)	4.6		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Copper (Cu)	13.4		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Lead (Pb)	17.7		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Mercury (Hg)	0.0294		0.0050	ug/g	11-MAY-18	11-MAY-18	R4040544
Molybdenum (Mo)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Nickel (Ni)	10.2		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Selenium (Se)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Silver (Ag)	<0.20		0.20	ug/g	11-MAY-18	11-MAY-18	R4042972
Thallium (Tl)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Uranium (U)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Vanadium (V)	23.9		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Zinc (Zn)	85.7		5.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Speciated Metals							
Chromium, Hexavalent	<0.20		0.20	ug/g	10-MAY-18	14-MAY-18	R4042953
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
Benzene	<0.0068		0.0068	ug/g	09-MAY-18	11-MAY-18	R4039955

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-11 S-11149990-050318-TW-10 Sampled By: TYLER W. on 03-MAY-18 @ 14:15 Matrix: SOIL							
Volatile Organic Compounds							
Bromodichloromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromoform	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromomethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Carbon tetrachloride	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Chlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Dibromochloromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Chloroform	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dibromoethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,3-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,4-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Dichlorodifluoromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Methylene Chloride	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichloropropane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-MAY-18	
Ethylbenzene	<0.018		0.018	ug/g	09-MAY-18	11-MAY-18	R4039955
n-Hexane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Methyl Ethyl Ketone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
MTBE	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Styrene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Tetrachloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Toluene	<0.080		0.080	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,1-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,2-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Trichloroethylene	<0.010		0.010	ug/g	09-MAY-18	11-MAY-18	R4039955
Trichlorofluoromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Vinyl chloride	<0.020		0.020	ug/g	09-MAY-18	11-MAY-18	R4039955
o-Xylene	<0.020		0.020	ug/g	09-MAY-18	11-MAY-18	R4039955
m+p-Xylenes	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
Xylenes (Total)	<0.050		0.050	ug/g		11-MAY-18	
Surrogate: 4-Bromofluorobenzene	86.9		50-140	%	09-MAY-18	11-MAY-18	R4039955

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-11 S-11149990-050318-TW-10 Sampled By: TYLER W. on 03-MAY-18 @ 14:15 Matrix: SOIL							
Volatile Organic Compounds							
Surrogate: 1,4-Difluorobenzene	99.1		50-140	%	09-MAY-18	11-MAY-18	R4039955
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	09-MAY-18	11-MAY-18	R4039955
F1-BTEX	<5.0		5.0	ug/g		11-MAY-18	
F2 (C10-C16)	<10		10	ug/g	10-MAY-18	11-MAY-18	R4040894
F2-Naphth	<10		10	ug/g		11-MAY-18	
F3 (C16-C34)	<50		50	ug/g	10-MAY-18	11-MAY-18	R4040894
F3-PAH	<50		50	ug/g		11-MAY-18	
F4 (C34-C50)	<50		50	ug/g	10-MAY-18	11-MAY-18	R4040894
Total Hydrocarbons (C6-C50)	<72		72	ug/g		11-MAY-18	
Chrom. to baseline at nC50	YES				10-MAY-18	11-MAY-18	R4040894
Surrogate: 2-Bromobenzotrifluoride	88.9		60-140	%	10-MAY-18	11-MAY-18	R4040894
Surrogate: 3,4-Dichlorotoluene	86.5		60-140	%	09-MAY-18	11-MAY-18	R4039955
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	<0.042		0.042	ug/g		11-MAY-18	
Semi-Volatile Organics							
Acenaphthene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Acenaphthylene	0.076		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Anthracene	0.124		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(a)anthracene	0.358		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(a)pyrene	0.410		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(b)fluoranthene	0.348		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(ghi)perylene	0.172		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(k)fluoranthene	0.387		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Biphenyl	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
4-Chloroaniline	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Bis(2-chloroethyl)ether	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Bis(2-chloroisopropyl)ether	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2-Chlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Chrysene	0.322		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Dibenzo(a,h)anthracene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
3,3'-Dichlorobenzidine	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Diethylphthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Dimethylphthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dimethylphenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dinitrophenol	<1.0		1.0	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dinitrotoluene	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,6-Dinitrotoluene	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4+2,6-Dinitrotoluene	<0.14		0.14	ug/g		11-MAY-18	
Bis(2-ethylhexyl)phthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Fluoranthene	0.616		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-11 S-11149990-050318-TW-10 Sampled By: TYLER W. on 03-MAY-18 @ 14:15 Matrix: SOIL							
Semi-Volatile Organics							
Fluorene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Indeno(1,2,3-cd)pyrene	0.229		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
1-Methylnaphthalene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4040412
2-Methylnaphthalene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4040412
Naphthalene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Pentachlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Phenanthrene	0.325		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Phenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Pyrene	0.557		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
1,2,4-Trichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4,5-Trichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4,6-Trichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Surrogate: 2-Fluorobiphenyl	92.1		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: Nitrobenzene d5	99.3		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: Phenol d5	97.1		30-130	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: p-Terphenyl d14	90.4		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: 2,4,6-Tribromophenol	97.1		50-140	%	09-MAY-18	11-MAY-18	R4040412
Polychlorinated Biphenyls							
Aroclor 1242	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1248	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1254	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1260	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Total PCBs	<0.020		0.020	ug/g	16-MAY-18	16-MAY-18	R4045150
Surrogate: d14-Terphenyl	106.2		60-140	%	16-MAY-18	16-MAY-18	R4045150
L2091162-12 S-11149990-050418-TW-11 Sampled By: TYLER W. on 04-MAY-18 @ 08:15 Matrix: SOIL							
Physical Tests							
Conductivity	0.727		0.0040	mS/cm		14-MAY-18	R4043686
% Moisture	9.53		0.10	%	10-MAY-18	10-MAY-18	R4040332
pH	7.69		0.10	pH units		11-MAY-18	R4040674
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	10-MAY-18	11-MAY-18	R4041545
Saturated Paste Extractables							
SAR	8.98		0.10	SAR		14-MAY-18	R4044158
Calcium (Ca)	13.0		1.0	mg/L		14-MAY-18	R4044158
Magnesium (Mg)	1.7		1.0	mg/L		14-MAY-18	R4044158
Sodium (Na)	130		1.0	mg/L		14-MAY-18	R4044158
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Arsenic (As)	4.1		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Barium (Ba)	61.5		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-12 S-11149990-050418-TW-11 Sampled By: TYLER W. on 04-MAY-18 @ 08:15 Matrix: SOIL							
Metals							
Beryllium (Be)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Boron (B)	13.2		5.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Boron (B), Hot Water Ext.	3.37		0.10	ug/g	11-MAY-18	14-MAY-18	R4044369
Cadmium (Cd)	0.52		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Chromium (Cr)	13.6		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Cobalt (Co)	6.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Copper (Cu)	25.5		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Lead (Pb)	40.7		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Mercury (Hg)	0.0659		0.0050	ug/g	11-MAY-18	11-MAY-18	R4040544
Molybdenum (Mo)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Nickel (Ni)	11.6		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Selenium (Se)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Silver (Ag)	<0.20		0.20	ug/g	11-MAY-18	11-MAY-18	R4042972
Thallium (Tl)	<0.50		0.50	ug/g	11-MAY-18	11-MAY-18	R4042972
Uranium (U)	<1.0		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Vanadium (V)	20.1		1.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Zinc (Zn)	174		5.0	ug/g	11-MAY-18	11-MAY-18	R4042972
Speciated Metals							
Chromium, Hexavalent	0.27		0.20	ug/g	10-MAY-18	14-MAY-18	R4042953
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
Benzene	<0.0068		0.0068	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromodichloromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromoform	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Bromomethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Carbon tetrachloride	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Chlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Dibromochloromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Chloroform	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dibromoethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,3-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,4-Dichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Dichlorodifluoromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Methylene Chloride	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,2-Dichloropropane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-12 S-11149990-050418-TW-11 Sampled By: TYLER W. on 04-MAY-18 @ 08:15 Matrix: SOIL							
Volatile Organic Compounds							
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-MAY-18	
Ethylbenzene	<0.018		0.018	ug/g	09-MAY-18	11-MAY-18	R4039955
n-Hexane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Methyl Ethyl Ketone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	09-MAY-18	11-MAY-18	R4039955
MTBE	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Styrene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Tetrachloroethylene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Toluene	<0.080		0.080	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,1-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
1,1,2-Trichloroethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Trichloroethylene	<0.010		0.010	ug/g	09-MAY-18	11-MAY-18	R4039955
Trichlorofluoromethane	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4039955
Vinyl chloride	<0.020		0.020	ug/g	09-MAY-18	11-MAY-18	R4039955
o-Xylene	<0.020		0.020	ug/g	09-MAY-18	11-MAY-18	R4039955
m+p-Xylenes	<0.030		0.030	ug/g	09-MAY-18	11-MAY-18	R4039955
Xylenes (Total)	<0.050		0.050	ug/g		11-MAY-18	
Surrogate: 4-Bromofluorobenzene	89.0		50-140	%	09-MAY-18	11-MAY-18	R4039955
Surrogate: 1,4-Difluorobenzene	101.9		50-140	%	09-MAY-18	11-MAY-18	R4039955
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	09-MAY-18	11-MAY-18	R4039955
F1-BTEX	<5.0		5.0	ug/g		11-MAY-18	
F2 (C10-C16)	<10		10	ug/g	10-MAY-18	11-MAY-18	R4040894
F2-Naphth	<10		10	ug/g		11-MAY-18	
F3 (C16-C34)	167		50	ug/g	10-MAY-18	11-MAY-18	R4040894
F3-PAH	147		50	ug/g		11-MAY-18	
F4 (C34-C50)	88		50	ug/g	10-MAY-18	11-MAY-18	R4040894
F4G-SG (GHH-Silica)	270		250	ug/g	11-MAY-18	11-MAY-18	R4042528
Total Hydrocarbons (C6-C50)	256		72	ug/g		11-MAY-18	
Chrom. to baseline at nC50	NO				10-MAY-18	11-MAY-18	R4040894
Surrogate: 2-Bromobenzotrifluoride	84.7		60-140	%	10-MAY-18	11-MAY-18	R4040894
Surrogate: 3,4-Dichlorotoluene	80.1		60-140	%	09-MAY-18	11-MAY-18	R4039955
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	0.360		0.042	ug/g		11-MAY-18	
Semi-Volatile Organics							
Acenaphthene	0.129		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Acenaphthylene	0.959		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Anthracene	1.09		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-12 S-11149990-050418-TW-11 Sampled By: TYLER W. on 04-MAY-18 @ 08:15 Matrix: SOIL							
Semi-Volatile Organics							
Benzo(a)anthracene	1.90	R	0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(a)pyrene	2.19		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(b)fluoranthene	1.43		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(ghi)perylene	1.13		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Benzo(k)fluoranthene	1.93		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Biphenyl	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
4-Chloroaniline	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Bis(2-chloroethyl)ether	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Bis(2-chloroisopropyl)ether	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2-Chlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Chrysene	1.73		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Dibenzo(a,h)anthracene	0.217		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
3,3'-Dichlorobenzidine	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Diethylphthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Dimethylphthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dimethylphenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dinitrophenol	<1.0		1.0	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4-Dinitrotoluene	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,6-Dinitrotoluene	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4+2,6-Dinitrotoluene	<0.14		0.14	ug/g		11-MAY-18	
Bis(2-ethylhexyl)phthalate	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Fluoranthene	3.99		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Fluorene	0.598		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Indeno(1,2,3-cd)pyrene	1.33		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
1-Methylnaphthalene	0.171		0.030	ug/g	09-MAY-18	11-MAY-18	R4040412
2-Methylnaphthalene	0.189		0.030	ug/g	09-MAY-18	11-MAY-18	R4040412
Naphthalene	0.275		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Pentachlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Phenanthrene	3.58		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
Phenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Pyrene	3.63		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
1,2,4-Trichlorobenzene	<0.050		0.050	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4,5-Trichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
2,4,6-Trichlorophenol	<0.10		0.10	ug/g	09-MAY-18	11-MAY-18	R4040412
Surrogate: 2-Fluorobiphenyl	91.4		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: Nitrobenzene d5	98.7		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: Phenol d5	93.5		30-130	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: p-Terphenyl d14	86.3		50-140	%	09-MAY-18	11-MAY-18	R4040412
Surrogate: 2,4,6-Tribromophenol	91.4		50-140	%	09-MAY-18	11-MAY-18	R4040412
Polychlorinated Biphenyls							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2091162-12 S-11149990-050418-TW-11 Sampled By: TYLER W. on 04-MAY-18 @ 08:15 Matrix: SOIL							
Polychlorinated Biphenyls							
Aroclor 1242	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1248	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1254	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Aroclor 1260	<0.010		0.010	ug/g	16-MAY-18	16-MAY-18	R4045150
Total PCBs	<0.020		0.020	ug/g	16-MAY-18	16-MAY-18	R4045150
Surrogate: d14-Terphenyl	102.6		60-140	%	16-MAY-18	16-MAY-18	R4045150
L2091162-13 S-11149990-050418-TW-12 Sampled By: TYLER W. on 04-MAY-18 @ 08:30 Matrix: SOIL							
Physical Tests							
% Moisture	10.5		0.10	%	05-JUN-18	05-JUN-18	R4071533
Saturated Paste Extractables							
SAR	2.79		0.10	SAR		08-JUN-18	R4076234
Calcium (Ca)	8.7		1.0	mg/L		08-JUN-18	R4076234
Magnesium (Mg)	2.7		1.0	mg/L		08-JUN-18	R4076234
Sodium (Na)	36.8		1.0	mg/L		08-JUN-18	R4076234
Polycyclic Aromatic Hydrocarbons							
Acenaphthylene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Anthracene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Benzo(a)anthracene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Benzo(a)pyrene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Benzo(b)fluoranthene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Benzo(k)fluoranthene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Dibenzo(ah)anthracene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Fluoranthene	0.067		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	05-JUN-18	08-JUN-18	R4075182
1+2-Methylnaphthalenes	<0.042		0.042	ug/g		08-JUN-18	
Surrogate: 2-Fluorobiphenyl	87.5		50-140	%	05-JUN-18	08-JUN-18	R4075182
Surrogate: p-Terphenyl d14	88.0		50-140	%	05-JUN-18	08-JUN-18	R4075182
L2091162-22 S-11149990-050418-TW-21 Sampled By: TYLER W. on 04-MAY-18 @ 14:20 Matrix: SOIL							
Physical Tests							
pH	7.54		0.10	pH units		11-MAY-18	R4040674
Particle Size							
% >75um	57.9		1.0	%	11-MAY-18	11-MAY-18	R4040502

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	2,4-Dinitrophenol	RRQC	L2091162-11, -12, -9

Comments: Recovery is outside ALS control limits. Associated sample results have not been affected.

Sample Parameter Qualifier key listed:

Qualifier	Description
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
PRAR	PCB Pattern Most Closely Resembles Aroclor Reported
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
RRQC	Refer to report remarks for information regarding this QC result.
SAR:M	Reported SAR represents a maximum value. Actual SAR may be lower if both Ca and Mg were detectable.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Soil	ABN-O.Reg 153/04 (July 2011)	SW846 8270 (511)

Soil and sediment samples are dried by mixing with a desiccant prior to extraction. The extracts are dried, concentrated and exchanged into a solvent and analyzed by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

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).

625-NO-PAH-WT	Soil	EPA 8270 Extractables	SW846 8270

Soil samples are extracted and the extracts are analyzed by GC/MSD.

625-WT	Soil	EPA 8270 Extractables	SW846 8270

Soil samples are extracted and the extracts are analyzed by GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

N-nitrosodiphenylamine is reported as diphenylamine. N-nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine. (EPA 8270D)

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).

BAP-WT	Soil	Benzo(a)pyrene	SW486 8270

The procedure uses a mechanical shaking technique to extract a representative sub-sample with a mixture of methanol and toluene. The extract is analyzed by GC/MSD.

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).

DINITROTOL-CALC-WT	Soil	ABN-Calculated Parameters	SW846 8270
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).

Reference Information

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.

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).

F4G-ADD-511-WT Soil F4G SG-O.Reg 153/04 (July 2011) MOE DECPH-E3398/CCME TIER 1

F4G, gravimetric analysis, is determined if the chromatogram does not return to baseline at or before C50. A soil sample is extracted with a solvent mix, the solvent is evaporated and the weight of the residue is determined.

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).

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)

This method uses a heated strong acid digestion with HNO3 and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.

Reference Information

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	Gravimetric: Oven Dried
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).

PCB-511-WT	Soil	PCB-O.Reg 153/04 (July 2011)	SW846 3510/8082

An aliquot of a solid sample is extracted with a solvent, extract is cleaned up and analyzed on the 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).

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).

PSA-75UM-SIEVE-WT	Soil	% Particles>75um (Coarse/Fine)	CARTER CSSS 55.4 (modified)

An air-dried sample is reduced to < 2 mm size and mixed with a dispersing agent (sodium metaphosphate). The sample is washed through a 200 mesh (75 µm) sieve. The retained mass of sample is used to determine % sand fraction. If the percentage of sand is >50%, the soil is considered to be coarse textured soil. If the percentage of sand is <50%, the soil is considered to be fine textured.

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).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed 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), 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.

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

Chain of Custody Numbers:

17-618892 17-622445

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 weight of sample
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.

Quality Control Report

Workorder: L2091162 Report Date: 25-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4040412								
WG2768390-4 DUP		**WG2768390-3**						
1-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	11-MAY-18
1,2,4-Trichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
2-Chlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
2-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	11-MAY-18
2,4-Dichlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
2,4-Dimethylphenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
2,4-Dinitrophenol		<1.0	<1.0	RPD-NA	ug/g	N/A	40	11-MAY-18
2,4-Dinitrotoluene		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
2,4,5-Trichlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
2,4,6-Trichlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
2,6-Dinitrotoluene		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
3,3'-Dichlorobenzidine		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
4-Chloroaniline		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Acenaphthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Benzo(b)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Benzo(ghi)perylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Biphenyl		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Bis(2-chloroethyl)ether		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Bis(2-chloroisopropyl)ether		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Bis(2-ethylhexyl)phthalate		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Chrysene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Dibenzo(a,h)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Diethylphthalate		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Dimethylphthalate		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Naphthalene		<0.050	<0.050		ug/g			11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4040412								
WG2768390-4 DUP		**WG2768390-3**						
Naphthalene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Pentachlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Phenanthrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
Phenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-MAY-18
WG2768390-2 LCS								
1-Methylnaphthalene			87.8		%		50-140	11-MAY-18
1,2,4-Trichlorobenzene			94.4		%		50-140	11-MAY-18
2-Chlorophenol			99.5		%		50-140	11-MAY-18
2-Methylnaphthalene			94.3		%		50-140	11-MAY-18
2,4-Dichlorophenol			101.3		%		50-140	11-MAY-18
2,4-Dimethylphenol			117.2		%		30-130	11-MAY-18
2,4-Dinitrophenol			108.1		%		30-130	11-MAY-18
2,4-Dinitrotoluene			99.3		%		50-140	11-MAY-18
2,4,5-Trichlorophenol			99.8		%		50-140	11-MAY-18
2,4,6-Trichlorophenol			95.0		%		50-140	11-MAY-18
2,6-Dinitrotoluene			97.3		%		50-140	11-MAY-18
3,3'-Dichlorobenzidine			113.0		%		30-130	11-MAY-18
4-Chloroaniline			88.2		%		30-130	11-MAY-18
Acenaphthene			87.7		%		50-140	11-MAY-18
Acenaphthylene			92.2		%		50-140	11-MAY-18
Anthracene			99.8		%		50-140	11-MAY-18
Benzo(a)anthracene			103.2		%		50-140	11-MAY-18
Benzo(a)pyrene			103.4		%		50-140	11-MAY-18
Benzo(b)fluoranthene			96.0		%		50-140	11-MAY-18
Benzo(ghi)perylene			82.1		%		50-140	11-MAY-18
Benzo(k)fluoranthene			100.8		%		50-140	11-MAY-18
Biphenyl			93.3		%		50-140	11-MAY-18
Bis(2-chloroethyl)ether			96.3		%		50-140	11-MAY-18
Bis(2-chloroisopropyl)ether			97.9		%		50-140	11-MAY-18
Bis(2-ethylhexyl)phthalate			99.6		%		50-140	11-MAY-18
Chrysene			102.4		%		50-140	11-MAY-18
Dibenzo(a,h)anthracene			85.4		%		50-140	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4040412								
WG2768390-2 LCS								
Diethylphthalate			100.3		%		50-140	11-MAY-18
Dimethylphthalate			95.8		%		50-140	11-MAY-18
Fluoranthene			80.9		%		50-140	11-MAY-18
Fluorene			92.9		%		50-140	11-MAY-18
Indeno(1,2,3-cd)pyrene			89.3		%		50-140	11-MAY-18
Naphthalene			93.3		%		50-140	11-MAY-18
Pentachlorophenol			113.5		%		50-140	11-MAY-18
Phenanthrene			93.6		%		50-140	11-MAY-18
Phenol			100.1		%		30-130	11-MAY-18
Pyrene			81.2		%		50-140	11-MAY-18
WG2768390-1 MB								
1-Methylnaphthalene			<0.030		ug/g		0.03	11-MAY-18
1,2,4-Trichlorobenzene			<0.050		ug/g		0.05	11-MAY-18
2-Chlorophenol			<0.10		ug/g		0.1	11-MAY-18
2-Methylnaphthalene			<0.030		ug/g		0.03	11-MAY-18
2,4-Dichlorophenol			<0.10		ug/g		0.1	11-MAY-18
2,4-Dimethylphenol			<0.10		ug/g		0.1	11-MAY-18
2,4-Dinitrophenol			<1.0		ug/g		1	11-MAY-18
2,4-Dinitrotoluene			<0.10		ug/g		0.1	11-MAY-18
2,4,5-Trichlorophenol			<0.10		ug/g		0.1	11-MAY-18
2,4,6-Trichlorophenol			<0.10		ug/g		0.1	11-MAY-18
2,6-Dinitrotoluene			<0.10		ug/g		0.1	11-MAY-18
3,3'-Dichlorobenzidine			<0.10		ug/g		0.1	11-MAY-18
4-Chloroaniline			<0.10		ug/g		0.1	11-MAY-18
Acenaphthene			<0.050		ug/g		0.05	11-MAY-18
Acenaphthylene			<0.050		ug/g		0.05	11-MAY-18
Anthracene			<0.050		ug/g		0.05	11-MAY-18
Benzo(a)anthracene			<0.050		ug/g		0.05	11-MAY-18
Benzo(a)pyrene			<0.050		ug/g		0.05	11-MAY-18
Benzo(b)fluoranthene			<0.050		ug/g		0.05	11-MAY-18
Benzo(ghi)perylene			<0.050		ug/g		0.05	11-MAY-18
Benzo(k)fluoranthene			<0.050		ug/g		0.05	11-MAY-18
Biphenyl			<0.050		ug/g		0.05	11-MAY-18
Bis(2-chloroethyl)ether			<0.10		ug/g		0.1	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4040412								
WG2768390-1 MB								
Bis(2-chloroisopropyl)ether			<0.10		ug/g		0.1	11-MAY-18
Bis(2-ethylhexyl)phthalate			<0.10		ug/g		0.1	11-MAY-18
Chrysene			<0.050		ug/g		0.05	11-MAY-18
Dibenzo(a,h)anthracene			<0.050		ug/g		0.05	11-MAY-18
Diethylphthalate			<0.10		ug/g		0.1	11-MAY-18
Dimethylphthalate			<0.10		ug/g		0.1	11-MAY-18
Fluoranthene			<0.050		ug/g		0.05	11-MAY-18
Fluorene			<0.050		ug/g		0.05	11-MAY-18
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	11-MAY-18
Naphthalene			<0.050		ug/g		0.05	11-MAY-18
Pentachlorophenol			<0.10		ug/g		0.1	11-MAY-18
Phenanthrene			<0.050		ug/g		0.05	11-MAY-18
Phenol			<0.10		ug/g		0.1	11-MAY-18
Pyrene			<0.050		ug/g		0.05	11-MAY-18
Surrogate: 2-Fluorobiphenyl			96.5		%		50-140	11-MAY-18
Surrogate: 2,4,6-Tribromophenol			86.8		%		50-140	11-MAY-18
Surrogate: Nitrobenzene d5			108.1		%		50-140	11-MAY-18
Surrogate: p-Terphenyl d14			91.9		%		50-140	11-MAY-18
Surrogate: Phenol d5			102.4		%		30-130	11-MAY-18
WG2768390-5 MS		**WG2768390-3**						
1-Methylnaphthalene			87.8		%		50-140	11-MAY-18
1,2,4-Trichlorobenzene			90.5		%		50-140	11-MAY-18
2-Chlorophenol			96.8		%		50-140	11-MAY-18
2-Methylnaphthalene			91.3		%		50-140	11-MAY-18
2,4-Dichlorophenol			96.7		%		50-140	11-MAY-18
2,4-Dimethylphenol			105.3		%		30-150	11-MAY-18
2,4-Dinitrophenol			26.7	RRQC	%		30-150	11-MAY-18
2,4-Dinitrotoluene			93.6		%		50-140	11-MAY-18
2,4,5-Trichlorophenol			92.1		%		50-140	11-MAY-18
2,4,6-Trichlorophenol			86.9		%		50-140	11-MAY-18
2,6-Dinitrotoluene			90.2		%		50-140	11-MAY-18
3,3'-Dichlorobenzidine			96.9		%		30-130	11-MAY-18
4-Chloroaniline			82.6		%		30-130	11-MAY-18
Acenaphthene			86.0		%		50-140	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4040412								
WG2768390-5 MS		**WG2768390-3**						
Acenaphthylene			87.7		%		50-140	11-MAY-18
Anthracene			94.1		%		50-140	11-MAY-18
Benzo(a)anthracene			96.1		%		50-140	11-MAY-18
Benzo(a)pyrene			96.0		%		50-140	11-MAY-18
Benzo(b)fluoranthene			90.0		%		50-140	11-MAY-18
Benzo(ghi)perylene			73.6		%		50-140	11-MAY-18
Benzo(k)fluoranthene			94.6		%		50-140	11-MAY-18
Biphenyl			88.8		%		50-140	11-MAY-18
Bis(2-chloroethyl)ether			92.3		%		50-140	11-MAY-18
Bis(2-chloroisopropyl)ether			94.2		%		50-140	11-MAY-18
Bis(2-ethylhexyl)phthalate			93.6		%		50-140	11-MAY-18
Chrysene			96.1		%		50-140	11-MAY-18
Dibenzo(a,h)anthracene			79.3		%		50-140	11-MAY-18
Diethylphthalate			96.2		%		50-140	11-MAY-18
Dimethylphthalate			90.4		%		50-140	11-MAY-18
Fluoranthene			78.3		%		50-140	11-MAY-18
Fluorene			89.0		%		50-140	11-MAY-18
Indeno(1,2,3-cd)pyrene			83.1		%		50-140	11-MAY-18
Naphthalene			89.3		%		50-140	11-MAY-18
Pentachlorophenol			73.9		%		50-140	11-MAY-18
Phenanthrene			89.3		%		50-140	11-MAY-18
Phenol			95.6		%		30-130	11-MAY-18
Pyrene			78.8		%		50-140	11-MAY-18
COMMENTS: Recovery is outside ALS control limits. Associated sample results have not been affected.								
B-HWS-R511-WT	**Soil**							
Batch R4044369								
WG2770789-4 DUP		**L2091162-18**						
Boron (B), Hot Water Ext.		11.5	11.8		ug/g	2.7	30	14-MAY-18
WG2770789-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			123.9		%		70-130	14-MAY-18
WG2770789-3 LCS								
Boron (B), Hot Water Ext.			108.0		%		70-130	14-MAY-18
WG2770789-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	14-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BAP-WT	**Soil**							
Batch R4075182								
WG2788646-4 DUP		**WG2788646-3**						
Benzo(a)pyrene		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	07-JUN-18
WG2788646-2 LCS								
Benzo(a)pyrene			94.6		%		60-140	07-JUN-18
WG2788646-1 MB								
Benzo(a)pyrene			<0.020		mg/kg		0.02	07-JUN-18
Surrogate: 2-Fluorobiphenyl			88.1		%		50-140	07-JUN-18
Surrogate: p-Terphenyl d14			87.2		%		50-140	07-JUN-18
WG2788646-5 MS		**WG2788646-3**						
Benzo(a)pyrene			95.4		%		50-140	07-JUN-18
CN-WAD-R511-WT	**Soil**							
Batch R4041545								
WG2768974-3 DUP		**L2090876-1**						
Cyanide, Weak Acid Diss		<0.050	0.050	RPD-NA	ug/g	N/A	35	11-MAY-18
WG2768974-2 LCS								
Cyanide, Weak Acid Diss			93.9		%		80-120	11-MAY-18
WG2768974-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	11-MAY-18
WG2768974-4 MS		**L2090876-1**						
Cyanide, Weak Acid Diss			101.4		%		70-130	11-MAY-18
CR-CR6-IC-WT	**Soil**							
Batch R4042953								
WG2769138-3 CRM		**WT-SQC012**						
Chromium, Hexavalent			89.3		%		70-130	14-MAY-18
WG2769138-4 DUP		**L2086582-1**						
Chromium, Hexavalent		0.25	0.25		ug/g	1.0	35	14-MAY-18
WG2769138-2 LCS								
Chromium, Hexavalent			102.8		%		80-120	14-MAY-18
WG2769138-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	14-MAY-18
EC-WT	**Soil**							
Batch R4043686								
WG2770763-4 DUP		**WG2770763-3**						
Conductivity		0.304	0.318		mS/cm	4.5	20	14-MAY-18
WG2771455-1 LCS								
Conductivity			91.0		%		90-110	14-MAY-18
WG2770763-1 MB								

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT	**Soil**							
Batch R4043686								
WG2770763-1 MB								
Conductivity			<0.0040		mS/cm		0.004	14-MAY-18
F1-HS-511-WT	**Soil**							
Batch R4039955								
WG2767820-4 DUP		**WG2767820-3**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	10-MAY-18
WG2767820-2 LCS								
F1 (C6-C10)			101.0		%		80-120	10-MAY-18
WG2767820-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	10-MAY-18
Surrogate: 3,4-Dichlorotoluene			104.8		%		60-140	10-MAY-18
WG2767820-6 MS		**L2091140-3**						
F1 (C6-C10)			103.6		%		60-140	10-MAY-18
Batch R4039969								
WG2768103-4 DUP		**WG2768103-3**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	10-MAY-18
WG2768103-2 LCS								
F1 (C6-C10)			87.5		%		80-120	10-MAY-18
WG2768103-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	10-MAY-18
Surrogate: 3,4-Dichlorotoluene			105.0		%		60-140	10-MAY-18
WG2768103-6 MS		**L2091209-11**						
F1 (C6-C10)			102.7		%		60-140	11-MAY-18
F2-F4-511-WT	**Soil**							
Batch R4040894								
WG2768889-4 DUP		**WG2768889-3**						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	11-MAY-18
F3 (C16-C34)		72	77		ug/g	6.4	30	11-MAY-18
F4 (C34-C50)		60	54		ug/g	10	30	11-MAY-18
WG2768889-2 LCS								
F2 (C10-C16)			102.1		%		80-120	11-MAY-18
F3 (C16-C34)			100.9		%		80-120	11-MAY-18
F4 (C34-C50)			99.0		%		80-120	11-MAY-18
WG2768889-1 MB								
F2 (C10-C16)			<10		ug/g		10	11-MAY-18
F3 (C16-C34)			<50		ug/g		50	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	**Soil**							
Batch R4040894								
WG2768889-1 MB								
F4 (C34-C50)			<50		ug/g		50	11-MAY-18
Surrogate: 2-Bromobenzotrifluoride			94.4		%		60-140	11-MAY-18
WG2768889-5 MS		**WG2768889-3**						
F2 (C10-C16)			99.4		%		60-140	11-MAY-18
F3 (C16-C34)			98.0		%		60-140	11-MAY-18
F4 (C34-C50)			91.1		%		60-140	11-MAY-18
F4G-ADD-511-WT	**Soil**							
Batch R4042528								
WG2771703-2 LCS								
F4G-SG (GHH-Silica)			65.3		%		60-140	11-MAY-18
WG2771703-1 MB								
F4G-SG (GHH-Silica)			<250		ug/g		250	11-MAY-18
HG-200.2-CVAA-WT	**Soil**							
Batch R4040544								
WG2769863-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			99.8		%		70-130	11-MAY-18
WG2769863-6 DUP		**WG2769863-5**						
Mercury (Hg)		<0.0050	0.0055	RPD-NA	ug/g	N/A	40	11-MAY-18
WG2769863-3 LCS								
Mercury (Hg)			102.0		%		80-120	11-MAY-18
WG2769863-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	11-MAY-18
Batch R4072393								
WG2789568-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			94.8		%		70-130	06-JUN-18
WG2789568-6 DUP		**WG2789568-5**						
Mercury (Hg)		0.0101	0.0089		ug/g	13	40	06-JUN-18
WG2789568-3 LCS								
Mercury (Hg)			108.5		%		80-120	06-JUN-18
WG2789568-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	06-JUN-18
MET-200.2-CCMS-WT	**Soil**							
Batch R4042972								
WG2769863-2 CRM		**WT-CANMET-TILL1**						
Antimony (Sb)			94.8		%		70-130	11-MAY-18
Arsenic (As)			101.7		%		70-130	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4042972								
WG2769863-2 CRM		**WT-CANMET-TILL1**						
Barium (Ba)			98.5		%		70-130	11-MAY-18
Beryllium (Be)			97.1		%		70-130	11-MAY-18
Boron (B)			3.5		mg/kg		0-8.2	11-MAY-18
Cadmium (Cd)			106.4		%		70-130	11-MAY-18
Chromium (Cr)			100.6		%		70-130	11-MAY-18
Cobalt (Co)			97.4		%		70-130	11-MAY-18
Copper (Cu)			102.9		%		70-130	11-MAY-18
Lead (Pb)			92.2		%		70-130	11-MAY-18
Molybdenum (Mo)			100.3		%		70-130	11-MAY-18
Nickel (Ni)			101.0		%		70-130	11-MAY-18
Selenium (Se)			0.33		mg/kg		0.11-0.51	11-MAY-18
Silver (Ag)			0.21		mg/kg		0.13-0.33	11-MAY-18
Thallium (Tl)			0.116		mg/kg		0.077-0.18	11-MAY-18
Uranium (U)			92.4		%		70-130	11-MAY-18
Vanadium (V)			101.5		%		70-130	11-MAY-18
Zinc (Zn)			105.5		%		70-130	11-MAY-18
WG2769863-6 DUP		**WG2769863-5**						
Antimony (Sb)		<0.10	<0.10	RPD-NA	ug/g	N/A	30	11-MAY-18
Arsenic (As)		1.15	1.30		ug/g	13	30	11-MAY-18
Barium (Ba)		15.2	17.4		ug/g	14	40	11-MAY-18
Beryllium (Be)		0.18	0.19		ug/g	3.4	30	11-MAY-18
Boron (B)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	11-MAY-18
Cadmium (Cd)		0.024	0.028		ug/g	16	30	11-MAY-18
Chromium (Cr)		6.43	7.13		ug/g	10	30	11-MAY-18
Cobalt (Co)		2.11	2.35		ug/g	11	30	11-MAY-18
Copper (Cu)		5.20	5.66		ug/g	8.5	30	11-MAY-18
Lead (Pb)		2.26	2.46		ug/g	8.5	40	11-MAY-18
Molybdenum (Mo)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Nickel (Ni)		4.36	4.89		ug/g	12	30	11-MAY-18
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	11-MAY-18
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	11-MAY-18
Thallium (Tl)		<0.050	<0.050	RPD-NA	ug/g	N/A	30	11-MAY-18
Uranium (U)		0.251	0.281		ug/g	11	30	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4042972								
WG2769863-6 DUP		**WG2769863-5**						
Vanadium (V)		11.4	13.0		ug/g	13	30	11-MAY-18
Zinc (Zn)		11.0	14.8		ug/g	30	30	11-MAY-18
WG2769863-4 LCS								
Antimony (Sb)			113.2		%		80-120	11-MAY-18
Arsenic (As)			112.6		%		80-120	11-MAY-18
Barium (Ba)			101.9		%		80-120	11-MAY-18
Beryllium (Be)			98.4		%		80-120	11-MAY-18
Boron (B)			100.7		%		80-120	11-MAY-18
Cadmium (Cd)			107.9		%		80-120	11-MAY-18
Chromium (Cr)			108.6		%		80-120	11-MAY-18
Cobalt (Co)			107.5		%		80-120	11-MAY-18
Copper (Cu)			111.3		%		80-120	11-MAY-18
Lead (Pb)			103.5		%		80-120	11-MAY-18
Molybdenum (Mo)			104.2		%		80-120	11-MAY-18
Nickel (Ni)			110.0		%		80-120	11-MAY-18
Selenium (Se)			113.1		%		80-120	11-MAY-18
Silver (Ag)			101.2		%		80-120	11-MAY-18
Thallium (Tl)			99.4		%		80-120	11-MAY-18
Uranium (U)			103.0		%		80-120	11-MAY-18
Vanadium (V)			112.5		%		80-120	11-MAY-18
Zinc (Zn)			106.0		%		80-120	11-MAY-18
WG2769863-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	11-MAY-18
Arsenic (As)			<0.10		mg/kg		0.1	11-MAY-18
Barium (Ba)			<0.50		mg/kg		0.5	11-MAY-18
Beryllium (Be)			<0.10		mg/kg		0.1	11-MAY-18
Boron (B)			<5.0		mg/kg		5	11-MAY-18
Cadmium (Cd)			<0.020		mg/kg		0.02	11-MAY-18
Chromium (Cr)			<0.50		mg/kg		0.5	11-MAY-18
Cobalt (Co)			<0.10		mg/kg		0.1	11-MAY-18
Copper (Cu)			<0.50		mg/kg		0.5	11-MAY-18
Lead (Pb)			<0.50		mg/kg		0.5	11-MAY-18
Molybdenum (Mo)			<0.10		mg/kg		0.1	11-MAY-18
Nickel (Ni)			<0.50		mg/kg		0.5	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4042972								
WG2769863-1 MB								
Selenium (Se)			<0.20		mg/kg		0.2	11-MAY-18
Silver (Ag)			<0.10		mg/kg		0.1	11-MAY-18
Thallium (Tl)			<0.050		mg/kg		0.05	11-MAY-18
Uranium (U)			<0.050		mg/kg		0.05	11-MAY-18
Vanadium (V)			<0.20		mg/kg		0.2	11-MAY-18
Zinc (Zn)			<2.0		mg/kg		2	11-MAY-18
Batch R4074941								
WG2789568-2 CRM		**WT-CANMET-TILL1**						
Cadmium (Cd)			104.1		%		70-130	06-JUN-18
Zinc (Zn)			108.6		%		70-130	06-JUN-18
WG2789568-6 DUP		**WG2789568-5**						
Cadmium (Cd)		0.057	0.050		ug/g	13	30	06-JUN-18
Zinc (Zn)		21.8	20.3		ug/g	6.8	30	06-JUN-18
WG2789568-4 LCS								
Cadmium (Cd)			81.7		%		80-120	06-JUN-18
Zinc (Zn)			103.1		%		80-120	06-JUN-18
WG2789568-1 MB								
Cadmium (Cd)			<0.020		mg/kg		0.02	06-JUN-18
Zinc (Zn)			<2.0		mg/kg		2	06-JUN-18
MOISTURE-WT	**Soil**							
Batch R4040332								
WG2769342-3 DUP		**L2091209-12**						
% Moisture		7.77	8.05		%	3.5	20	10-MAY-18
WG2769342-2 LCS								
% Moisture			100.6		%		90-110	10-MAY-18
WG2769342-1 MB								
% Moisture			<0.10		%		0.1	10-MAY-18
Batch R4040337								
WG2769176-3 DUP		**L2091198-1**						
% Moisture		11.0	10.8		%	1.8	20	11-MAY-18
WG2769176-2 LCS								
% Moisture			102.4		%		90-110	11-MAY-18
WG2769176-1 MB								
% Moisture			<0.10		%		0.1	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-WT	**Soil**							
Batch R4071533								
WG2788854-3 DUP		**L2104587-3**						
% Moisture		15.6	15.7		%	0.4	20	05-JUN-18
WG2788854-2 LCS								
% Moisture			99.8		%		90-110	05-JUN-18
WG2788854-1 MB								
% Moisture			<0.10		%		0.1	05-JUN-18
PAH-511-WT	**Soil**							
Batch R4075182								
WG2788646-4 DUP		**WG2788646-3**						
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Benzo(b)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Dibenzo(ah)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	07-JUN-18
WG2788646-2 LCS								
Acenaphthylene			96.0		%		50-140	07-JUN-18
Anthracene			97.6		%		50-140	07-JUN-18
Benzo(a)anthracene			98.8		%		50-140	07-JUN-18
Benzo(a)pyrene			94.6		%		50-140	07-JUN-18
Benzo(b)fluoranthene			93.8		%		50-140	07-JUN-18
Benzo(k)fluoranthene			101.1		%		50-140	07-JUN-18
Dibenzo(ah)anthracene			89.9		%		50-140	07-JUN-18
Fluoranthene			96.6		%		50-140	07-JUN-18
Indeno(1,2,3-cd)pyrene			93.6		%		50-140	07-JUN-18
WG2788646-1 MB								
Acenaphthylene			<0.050		ug/g		0.05	07-JUN-18
Anthracene			<0.050		ug/g		0.05	07-JUN-18
Benzo(a)anthracene			<0.050		ug/g		0.05	07-JUN-18
Benzo(a)pyrene			<0.050		ug/g		0.05	07-JUN-18
Benzo(b)fluoranthene			<0.050		ug/g		0.05	07-JUN-18
Benzo(k)fluoranthene			<0.050		ug/g		0.05	07-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R4075182								
WG2788646-1 MB								
Dibenzo(ah)anthracene			<0.050		ug/g		0.05	07-JUN-18
Fluoranthene			<0.050		ug/g		0.05	07-JUN-18
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	07-JUN-18
Surrogate: 2-Fluorobiphenyl			88.1		%		50-140	07-JUN-18
Surrogate: p-Terphenyl d14			87.2		%		50-140	07-JUN-18
WG2788646-5 MS		**WG2788646-3**						
Acenaphthylene			91.6		%		50-140	07-JUN-18
Anthracene			94.3		%		50-140	07-JUN-18
Benzo(a)anthracene			98.0		%		50-140	07-JUN-18
Benzo(a)pyrene			95.4		%		50-140	07-JUN-18
Benzo(b)fluoranthene			95.1		%		50-140	07-JUN-18
Benzo(k)fluoranthene			104.7		%		50-140	07-JUN-18
Dibenzo(ah)anthracene			91.8		%		50-140	07-JUN-18
Fluoranthene			97.5		%		50-140	07-JUN-18
Indeno(1,2,3-cd)pyrene			85.3		%		50-140	07-JUN-18
PCB-511-WT	**Soil**							
Batch R4045150								
WG2769277-3 DUP		**WG2769277-5**						
Aroclor 1242		<0.010	<0.010	RPD-NA	ug/g	N/A	40	16-MAY-18
Aroclor 1248		<0.010	<0.010	RPD-NA	ug/g	N/A	40	16-MAY-18
Aroclor 1254		<0.010	<0.010	RPD-NA	ug/g	N/A	40	16-MAY-18
Aroclor 1260		<0.010	<0.010	RPD-NA	ug/g	N/A	40	16-MAY-18
WG2769277-2 LCS								
Aroclor 1242			100.4		%		60-140	16-MAY-18
Aroclor 1248			91.1		%		60-140	16-MAY-18
Aroclor 1254			102.2		%		60-140	16-MAY-18
Aroclor 1260			109.8		%		60-140	16-MAY-18
WG2769277-1 MB								
Aroclor 1242			<0.010		ug/g		0.01	16-MAY-18
Aroclor 1248			<0.010		ug/g		0.01	16-MAY-18
Aroclor 1254			<0.010		ug/g		0.01	16-MAY-18
Aroclor 1260			<0.010		ug/g		0.01	16-MAY-18
Surrogate: d14-Terphenyl			102.2		%		60-140	16-MAY-18
WG2769277-4 MS		**WG2769277-5**						

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT	**Soil**							
Batch R4045150								
WG2769277-4 MS		**WG2769277-5**						
Aroclor 1242			97.2		%		60-140	16-MAY-18
Aroclor 1254			102.4		%		60-140	16-MAY-18
Aroclor 1260			110.3		%		60-140	16-MAY-18
PH-WT	**Soil**							
Batch R4040674								
WG2768912-1 DUP		**L2090876-1**						
pH		6.91	6.94	J	pH units	0.03	0.3	11-MAY-18
WG2770016-1 LCS								
pH			6.97		pH units		6.9-7.1	11-MAY-18
SAR-R511-WT	**Soil**							
Batch R4044158								
WG2770763-4 DUP		**WG2770763-3**						
Calcium (Ca)		29.4	33.6		mg/L	13	30	14-MAY-18
Sodium (Na)		10.7	12.3		mg/L	14	30	14-MAY-18
Magnesium (Mg)		2.2	2.6		mg/L	16	30	14-MAY-18
WG2770763-2 IRM		**WT SAR2**						
Calcium (Ca)			104.6		%		70-130	14-MAY-18
Sodium (Na)			104.9		%		70-130	14-MAY-18
Magnesium (Mg)			110.4		%		70-130	14-MAY-18
WG2770763-1 MB								
Calcium (Ca)			<1.0		mg/L		1	14-MAY-18
Sodium (Na)			<1.0		mg/L		1	14-MAY-18
Magnesium (Mg)			<1.0		mg/L		1	14-MAY-18
Batch R4076234								
WG2791786-4 DUP		**WG2791786-3**						
Calcium (Ca)		11.0	10.5		mg/L	5.0	30	08-JUN-18
Sodium (Na)		118	119		mg/L	1.2	30	08-JUN-18
Magnesium (Mg)		13.4	13.6		mg/L	1.5	30	08-JUN-18
WG2791786-2 IRM		**WT SAR2**						
Calcium (Ca)			106.7		%		70-130	08-JUN-18
Sodium (Na)			98.4		%		70-130	08-JUN-18
Magnesium (Mg)			105.1		%		70-130	08-JUN-18
WG2791786-1 MB								
Calcium (Ca)			<1.0		mg/L		1	08-JUN-18
Sodium (Na)			<1.0		mg/L		1	08-JUN-18

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Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SAR-R511-WT	**Soil**							
Batch R4076234								
WG2791786-1 MB								
Magnesium (Mg)			<1.0		mg/L		1	08-JUN-18
VOC-511-HS-WT	**Soil**							
Batch R4039955								
WG2767820-4 DUP		**WG2767820-3**						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	10-MAY-18
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	10-MAY-18
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	10-MAY-18
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	10-MAY-18
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039955								
WG2767820-4 DUP		**WG2767820-3**						
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	10-MAY-18
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	10-MAY-18
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	10-MAY-18
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	10-MAY-18
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	10-MAY-18
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	10-MAY-18
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	10-MAY-18
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	10-MAY-18
WG2767820-2 LCS								
1,1,1,2-Tetrachloroethane			93.1		%		60-130	10-MAY-18
1,1,2,2-Tetrachloroethane			88.3		%		60-130	10-MAY-18
1,1,1-Trichloroethane			94.9		%		60-130	10-MAY-18
1,1,2-Trichloroethane			97.6		%		60-130	10-MAY-18
1,1-Dichloroethane			96.8		%		60-130	10-MAY-18
1,1-Dichloroethylene			87.5		%		60-130	10-MAY-18
1,2-Dibromoethane			95.5		%		70-130	10-MAY-18
1,2-Dichlorobenzene			98.1		%		70-130	10-MAY-18
1,2-Dichloroethane			94.3		%		60-130	10-MAY-18
1,2-Dichloropropane			97.8		%		70-130	10-MAY-18
1,3-Dichlorobenzene			98.0		%		70-130	10-MAY-18
1,4-Dichlorobenzene			99.2		%		70-130	10-MAY-18
Acetone			100.9		%		60-140	10-MAY-18
Benzene			100.5		%		70-130	10-MAY-18
Bromodichloromethane			93.0		%		50-140	10-MAY-18
Bromoform			87.5		%		70-130	10-MAY-18
Bromomethane			97.4		%		50-140	10-MAY-18
Carbon tetrachloride			92.7		%		70-130	10-MAY-18
Chlorobenzene			97.3		%		70-130	10-MAY-18
Chloroform			97.0		%		70-130	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039955								
WG2767820-2 LCS								
cis-1,2-Dichloroethylene			99.2		%		70-130	10-MAY-18
cis-1,3-Dichloropropene			95.2		%		70-130	10-MAY-18
Dibromochloromethane			94.7		%		60-130	10-MAY-18
Dichlorodifluoromethane			71.2		%		50-140	10-MAY-18
Ethylbenzene			94.6		%		70-130	10-MAY-18
n-Hexane			107.9		%		70-130	10-MAY-18
Methylene Chloride			99.7		%		70-130	10-MAY-18
MTBE			101.0		%		70-130	10-MAY-18
m+p-Xylenes			96.5		%		70-130	10-MAY-18
Methyl Ethyl Ketone			102.7		%		60-140	10-MAY-18
Methyl Isobutyl Ketone			88.9		%		60-140	10-MAY-18
o-Xylene			93.4		%		70-130	10-MAY-18
Styrene			91.6		%		70-130	10-MAY-18
Tetrachloroethylene			96.5		%		60-130	10-MAY-18
Toluene			97.8		%		70-130	10-MAY-18
trans-1,2-Dichloroethylene			96.8		%		60-130	10-MAY-18
trans-1,3-Dichloropropene			91.6		%		70-130	10-MAY-18
Trichloroethylene			99.1		%		60-130	10-MAY-18
Trichlorofluoromethane			95.6		%		50-140	10-MAY-18
Vinyl chloride			92.0		%		60-140	10-MAY-18
WG2767820-1 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1,1-Trichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1,2-Trichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1-Dichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1-Dichloroethylene			<0.050		ug/g		0.05	10-MAY-18
1,2-Dibromoethane			<0.050		ug/g		0.05	10-MAY-18
1,2-Dichlorobenzene			<0.050		ug/g		0.05	10-MAY-18
1,2-Dichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,2-Dichloropropane			<0.050		ug/g		0.05	10-MAY-18
1,3-Dichlorobenzene			<0.050		ug/g		0.05	10-MAY-18
1,4-Dichlorobenzene			<0.050		ug/g		0.05	10-MAY-18
Acetone			<0.50		ug/g		0.5	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039955								
WG2767820-1 MB								
Benzene			<0.0068		ug/g		0.0068	10-MAY-18
Bromodichloromethane			<0.050		ug/g		0.05	10-MAY-18
Bromoform			<0.050		ug/g		0.05	10-MAY-18
Bromomethane			<0.050		ug/g		0.05	10-MAY-18
Carbon tetrachloride			<0.050		ug/g		0.05	10-MAY-18
Chlorobenzene			<0.050		ug/g		0.05	10-MAY-18
Chloroform			<0.050		ug/g		0.05	10-MAY-18
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	10-MAY-18
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	10-MAY-18
Dibromochloromethane			<0.050		ug/g		0.05	10-MAY-18
Dichlorodifluoromethane			<0.050		ug/g		0.05	10-MAY-18
Ethylbenzene			<0.018		ug/g		0.018	10-MAY-18
n-Hexane			<0.050		ug/g		0.05	10-MAY-18
Methylene Chloride			<0.050		ug/g		0.05	10-MAY-18
MTBE			<0.050		ug/g		0.05	10-MAY-18
m+p-Xylenes			<0.030		ug/g		0.03	10-MAY-18
Methyl Ethyl Ketone			<0.50		ug/g		0.5	10-MAY-18
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	10-MAY-18
o-Xylene			<0.020		ug/g		0.02	10-MAY-18
Styrene			<0.050		ug/g		0.05	10-MAY-18
Tetrachloroethylene			<0.050		ug/g		0.05	10-MAY-18
Toluene			<0.080		ug/g		0.08	10-MAY-18
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	10-MAY-18
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	10-MAY-18
Trichloroethylene			<0.010		ug/g		0.01	10-MAY-18
Trichlorofluoromethane			<0.050		ug/g		0.05	10-MAY-18
Vinyl chloride			<0.020		ug/g		0.02	10-MAY-18
Surrogate: 1,4-Difluorobenzene			111.7		%		50-140	10-MAY-18
Surrogate: 4-Bromofluorobenzene			100.2		%		50-140	10-MAY-18
WG2767820-5 MS		**L2091140-1**						
1,1,1,2-Tetrachloroethane			97.3		%		50-140	10-MAY-18
1,1,2,2-Tetrachloroethane			98.4		%		50-140	10-MAY-18
1,1,1-Trichloroethane			97.3		%		50-140	10-MAY-18
1,1,2-Trichloroethane			105.7		%		50-140	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039955								
WG2767820-5 MS		**L2091140-1**						
1,1-Dichloroethane			101.5		%		50-140	10-MAY-18
1,1-Dichloroethylene			90.0		%		50-140	10-MAY-18
1,2-Dibromoethane			104.4		%		50-140	10-MAY-18
1,2-Dichlorobenzene			101.7		%		50-140	10-MAY-18
1,2-Dichloroethane			102.4		%		50-140	10-MAY-18
1,2-Dichloropropane			103.7		%		50-140	10-MAY-18
1,3-Dichlorobenzene			99.2		%		50-140	10-MAY-18
1,4-Dichlorobenzene			100.7		%		50-140	10-MAY-18
Acetone			118.4		%		50-140	10-MAY-18
Benzene			105.4		%		50-140	10-MAY-18
Bromodichloromethane			98.6		%		50-140	10-MAY-18
Bromoform			95.7		%		50-140	10-MAY-18
Bromomethane			100.1		%		50-140	10-MAY-18
Carbon tetrachloride			94.7		%		50-140	10-MAY-18
Chlorobenzene			100.8		%		50-140	10-MAY-18
Chloroform			102.1		%		50-140	10-MAY-18
cis-1,2-Dichloroethylene			104.2		%		50-140	10-MAY-18
cis-1,3-Dichloropropene			96.6		%		50-140	10-MAY-18
Dibromochloromethane			101.7		%		50-140	10-MAY-18
Dichlorodifluoromethane			74.2		%		50-140	10-MAY-18
Ethylbenzene			96.3		%		50-140	10-MAY-18
n-Hexane			111.6		%		50-140	10-MAY-18
Methylene Chloride			106.6		%		50-140	10-MAY-18
MTBE			105.1		%		50-140	10-MAY-18
m+p-Xylenes			98.2		%		50-140	10-MAY-18
Methyl Ethyl Ketone			118.5		%		50-140	10-MAY-18
Methyl Isobutyl Ketone			102.0		%		50-140	10-MAY-18
o-Xylene			95.9		%		50-140	10-MAY-18
Styrene			94.9		%		50-140	10-MAY-18
Tetrachloroethylene			96.9		%		50-140	10-MAY-18
Toluene			100.6		%		50-140	10-MAY-18
trans-1,2-Dichloroethylene			99.6		%		50-140	10-MAY-18
trans-1,3-Dichloropropene			92.9		%		50-140	10-MAY-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039955								
WG2767820-5 MS		**L2091140-1**						
Trichloroethylene			101.4		%		50-140	10-MAY-18
Trichlorofluoromethane			98.2		%		50-140	10-MAY-18
Vinyl chloride			95.1		%		50-140	10-MAY-18
Batch R4039969								
WG2768103-4 DUP		**WG2768103-3**						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	10-MAY-18
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	10-MAY-18
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	10-MAY-18
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	10-MAY-18
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039969								
WG2768103-4 DUP		**WG2768103-3**						
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	10-MAY-18
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	10-MAY-18
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	10-MAY-18
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	10-MAY-18
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	10-MAY-18
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	10-MAY-18
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	10-MAY-18
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	10-MAY-18
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	10-MAY-18
WG2768103-2 LCS								
1,1,1,2-Tetrachloroethane			97.7		%		60-130	10-MAY-18
1,1,2,2-Tetrachloroethane			105.5		%		60-130	10-MAY-18
1,1,1-Trichloroethane			97.4		%		60-130	10-MAY-18
1,1,2-Trichloroethane			100.5		%		60-130	10-MAY-18
1,1-Dichloroethane			97.3		%		60-130	10-MAY-18
1,1-Dichloroethylene			86.0		%		60-130	10-MAY-18
1,2-Dibromoethane			103.1		%		70-130	10-MAY-18
1,2-Dichlorobenzene			96.4		%		70-130	10-MAY-18
1,2-Dichloroethane			105.8		%		60-130	10-MAY-18
1,2-Dichloropropane			100.3		%		70-130	10-MAY-18
1,3-Dichlorobenzene			92.3		%		70-130	10-MAY-18
1,4-Dichlorobenzene			95.1		%		70-130	10-MAY-18
Acetone			119.6		%		60-140	10-MAY-18
Benzene			98.9		%		70-130	10-MAY-18
Bromodichloromethane			99.8		%		50-140	10-MAY-18
Bromoform			101.2		%		70-130	10-MAY-18
Bromomethane			97.2		%		50-140	10-MAY-18
Carbon tetrachloride			95.5		%		70-130	10-MAY-18
Chlorobenzene			97.4		%		70-130	10-MAY-18
Chloroform			99.9		%		70-130	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039969								
WG2768103-2 LCS								
cis-1,2-Dichloroethylene			99.6		%		70-130	10-MAY-18
cis-1,3-Dichloropropene			109.8		%		70-130	10-MAY-18
Dibromochloromethane			103.9		%		60-130	10-MAY-18
Dichlorodifluoromethane			76.1		%		50-140	10-MAY-18
Ethylbenzene			91.4		%		70-130	10-MAY-18
n-Hexane			102.9		%		70-130	10-MAY-18
Methylene Chloride			101.0		%		70-130	10-MAY-18
MTBE			103.4		%		70-130	10-MAY-18
m+p-Xylenes			92.7		%		70-130	10-MAY-18
Methyl Ethyl Ketone			119.3		%		60-140	10-MAY-18
Methyl Isobutyl Ketone			117.0		%		60-140	10-MAY-18
o-Xylene			93.3		%		70-130	10-MAY-18
Styrene			95.5		%		70-130	10-MAY-18
Tetrachloroethylene			92.6		%		60-130	10-MAY-18
Toluene			91.8		%		70-130	10-MAY-18
trans-1,2-Dichloroethylene			98.0		%		60-130	10-MAY-18
trans-1,3-Dichloropropene			106.4		%		70-130	10-MAY-18
Trichloroethylene			100.1		%		60-130	10-MAY-18
Trichlorofluoromethane			95.6		%		50-140	10-MAY-18
Vinyl chloride			87.9		%		60-140	10-MAY-18
WG2768103-1 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1,1-Trichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1,2-Trichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1-Dichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,1-Dichloroethylene			<0.050		ug/g		0.05	10-MAY-18
1,2-Dibromoethane			<0.050		ug/g		0.05	10-MAY-18
1,2-Dichlorobenzene			<0.050		ug/g		0.05	10-MAY-18
1,2-Dichloroethane			<0.050		ug/g		0.05	10-MAY-18
1,2-Dichloropropane			<0.050		ug/g		0.05	10-MAY-18
1,3-Dichlorobenzene			<0.050		ug/g		0.05	10-MAY-18
1,4-Dichlorobenzene			<0.050		ug/g		0.05	10-MAY-18
Acetone			<0.50		ug/g		0.5	10-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039969								
WG2768103-1 MB								
Benzene			<0.0068		ug/g		0.0068	10-MAY-18
Bromodichloromethane			<0.050		ug/g		0.05	10-MAY-18
Bromoform			<0.050		ug/g		0.05	10-MAY-18
Bromomethane			<0.050		ug/g		0.05	10-MAY-18
Carbon tetrachloride			<0.050		ug/g		0.05	10-MAY-18
Chlorobenzene			<0.050		ug/g		0.05	10-MAY-18
Chloroform			<0.050		ug/g		0.05	10-MAY-18
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	10-MAY-18
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	10-MAY-18
Dibromochloromethane			<0.050		ug/g		0.05	10-MAY-18
Dichlorodifluoromethane			<0.050		ug/g		0.05	10-MAY-18
Ethylbenzene			<0.018		ug/g		0.018	10-MAY-18
n-Hexane			<0.050		ug/g		0.05	10-MAY-18
Methylene Chloride			<0.050		ug/g		0.05	10-MAY-18
MTBE			<0.050		ug/g		0.05	10-MAY-18
m+p-Xylenes			<0.030		ug/g		0.03	10-MAY-18
Methyl Ethyl Ketone			<0.50		ug/g		0.5	10-MAY-18
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	10-MAY-18
o-Xylene			<0.020		ug/g		0.02	10-MAY-18
Styrene			<0.050		ug/g		0.05	10-MAY-18
Tetrachloroethylene			<0.050		ug/g		0.05	10-MAY-18
Toluene			<0.080		ug/g		0.08	10-MAY-18
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	10-MAY-18
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	10-MAY-18
Trichloroethylene			<0.010		ug/g		0.01	10-MAY-18
Trichlorofluoromethane			<0.050		ug/g		0.05	10-MAY-18
Vinyl chloride			<0.020		ug/g		0.02	10-MAY-18
Surrogate: 1,4-Difluorobenzene			108.4		%		50-140	10-MAY-18
Surrogate: 4-Bromofluorobenzene			103.3		%		50-140	10-MAY-18
WG2768103-5 MS		**L2091209-6**						
1,1,1,2-Tetrachloroethane			102.2		%		50-140	11-MAY-18
1,1,2,2-Tetrachloroethane			108.5		%		50-140	11-MAY-18
1,1,1-Trichloroethane			102.1		%		50-140	11-MAY-18
1,1,2-Trichloroethane			104.9		%		50-140	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039969								
WG2768103-5 MS		**L2091209-6**						
1,1-Dichloroethane			101.2		%		50-140	11-MAY-18
1,1-Dichloroethylene			90.0		%		50-140	11-MAY-18
1,2-Dibromoethane			108.1		%		50-140	11-MAY-18
1,2-Dichlorobenzene			99.7		%		50-140	11-MAY-18
1,2-Dichloroethane			110.9		%		50-140	11-MAY-18
1,2-Dichloropropane			103.2		%		50-140	11-MAY-18
1,3-Dichlorobenzene			95.8		%		50-140	11-MAY-18
1,4-Dichlorobenzene			98.6		%		50-140	11-MAY-18
Acetone			126.1		%		50-140	11-MAY-18
Benzene			102.1		%		50-140	11-MAY-18
Bromodichloromethane			104.3		%		50-140	11-MAY-18
Bromoform			104.9		%		50-140	11-MAY-18
Bromomethane			101.8		%		50-140	11-MAY-18
Carbon tetrachloride			100.6		%		50-140	11-MAY-18
Chlorobenzene			100.5		%		50-140	11-MAY-18
Chloroform			104.5		%		50-140	11-MAY-18
cis-1,2-Dichloroethylene			103.8		%		50-140	11-MAY-18
cis-1,3-Dichloropropene			110.6		%		50-140	11-MAY-18
Dibromochloromethane			108.8		%		50-140	11-MAY-18
Dichlorodifluoromethane			82.6		%		50-140	11-MAY-18
Ethylbenzene			94.0		%		50-140	11-MAY-18
n-Hexane			107.7		%		50-140	11-MAY-18
Methylene Chloride			106.1		%		50-140	11-MAY-18
MTBE			107.7		%		50-140	11-MAY-18
m+p-Xylenes			95.2		%		50-140	11-MAY-18
Methyl Ethyl Ketone			122.7		%		50-140	11-MAY-18
Methyl Isobutyl Ketone			118.1		%		50-140	11-MAY-18
o-Xylene			95.7		%		50-140	11-MAY-18
Styrene			97.9		%		50-140	11-MAY-18
Tetrachloroethylene			96.7		%		50-140	11-MAY-18
Toluene			94.9		%		50-140	11-MAY-18
trans-1,2-Dichloroethylene			101.3		%		50-140	11-MAY-18
trans-1,3-Dichloropropene			106.8		%		50-140	11-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4039969								
WG2768103-5 MS		**L2091209-6**						
Trichloroethylene			104.8		%		50-140	11-MAY-18
Trichlorofluoromethane			102.0		%		50-140	11-MAY-18
Vinyl chloride			91.6		%		50-140	11-MAY-18

Quality Control Report

Workorder: L2091162 Report Date: 25-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

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.
RRQC	Refer to report remarks for information regarding this QC result.

Quality Control Report

Workorder: L2091162 Report Date: 25-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
% Moisture							
	10	03-MAY-18 08:40	05-JUN-18 12:47	14	33	days	EHT
	13	04-MAY-18 08:30	05-JUN-18 12:48	14	32	days	EHT
Polycyclic Aromatic Hydrocarbons							
Benzo(a)pyrene							
	10	03-MAY-18 08:40	05-JUN-18 09:00	14	33	days	EHT

Legend & Qualifier Definitions:

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

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2091162 were received on 08-MAY-18 18:35.

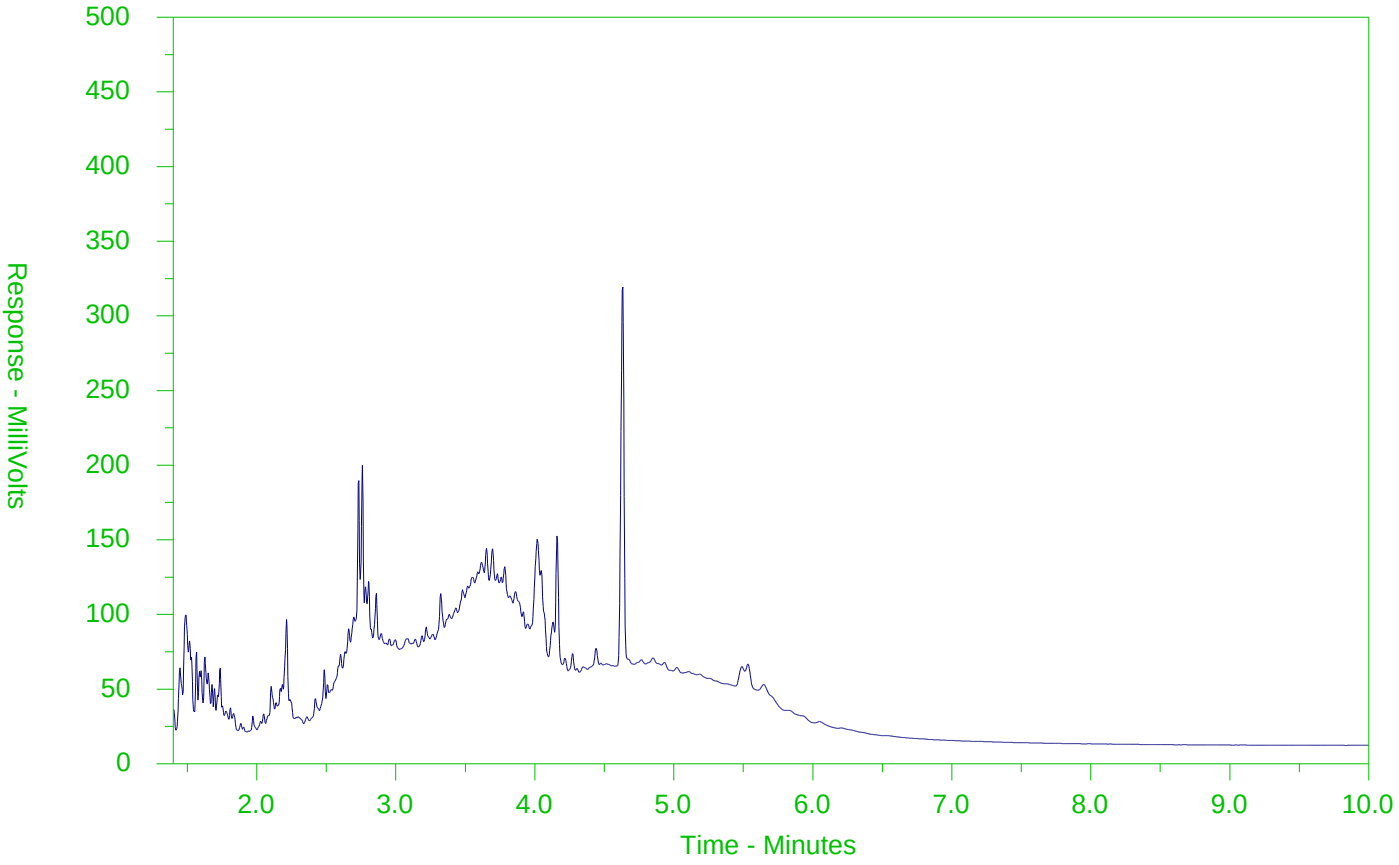
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where 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: L2091162-2
Client Sample ID: S-11149990-050118-TW-01



←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.

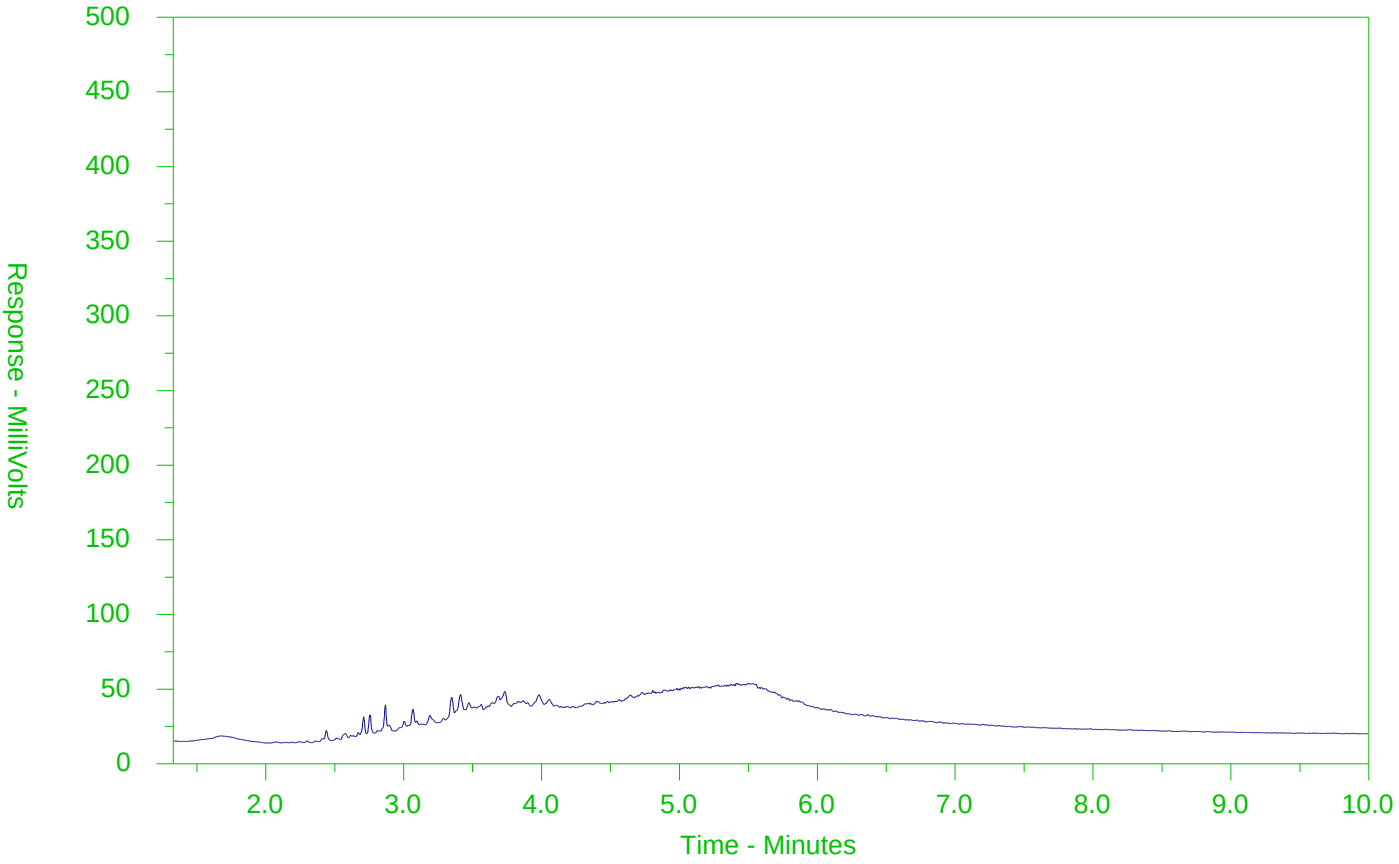
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-3
Client Sample ID: S-11149990-050118-TW-02



←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.

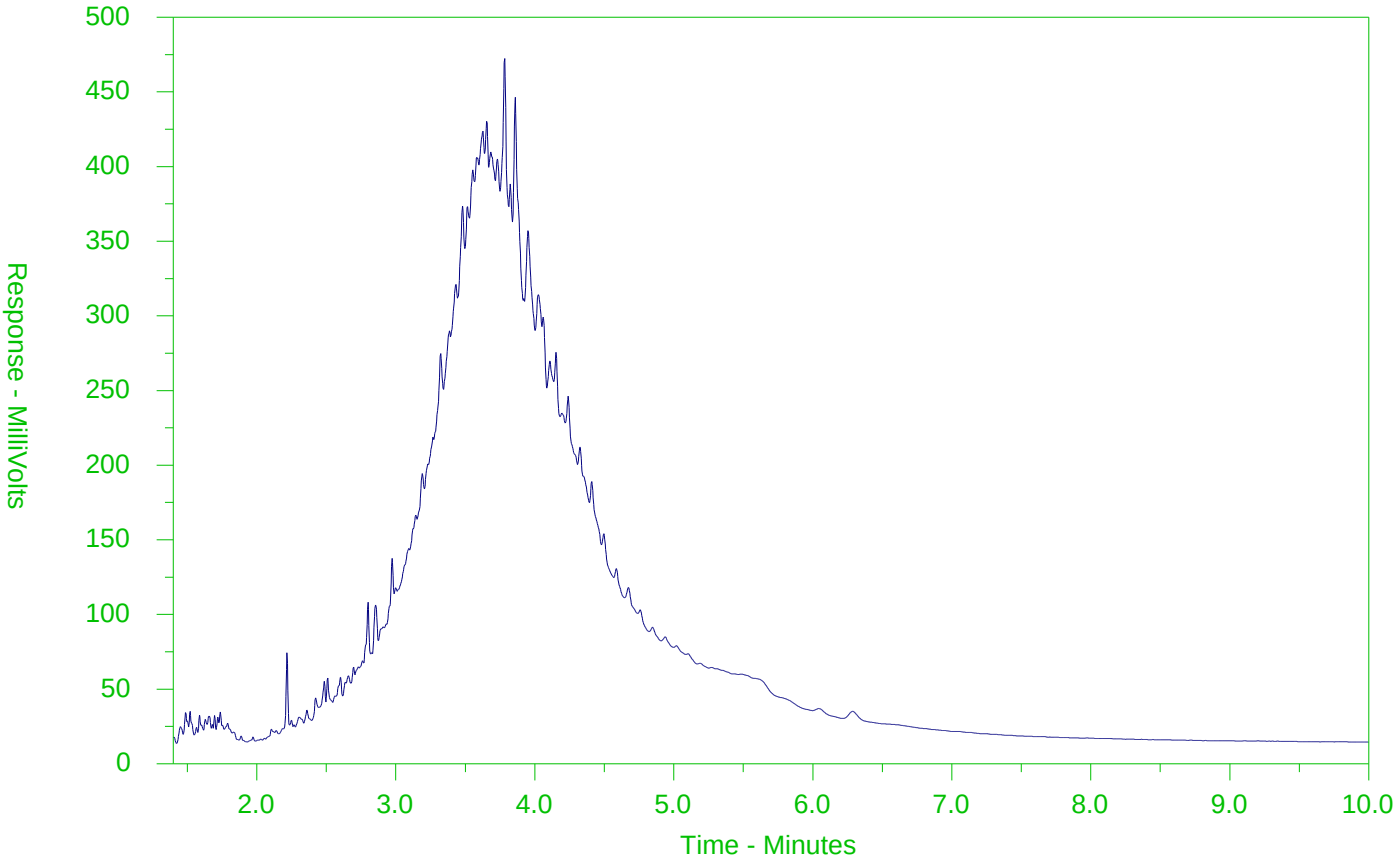
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-4
Client Sample ID: S-11149990-050118-TW-03



←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.

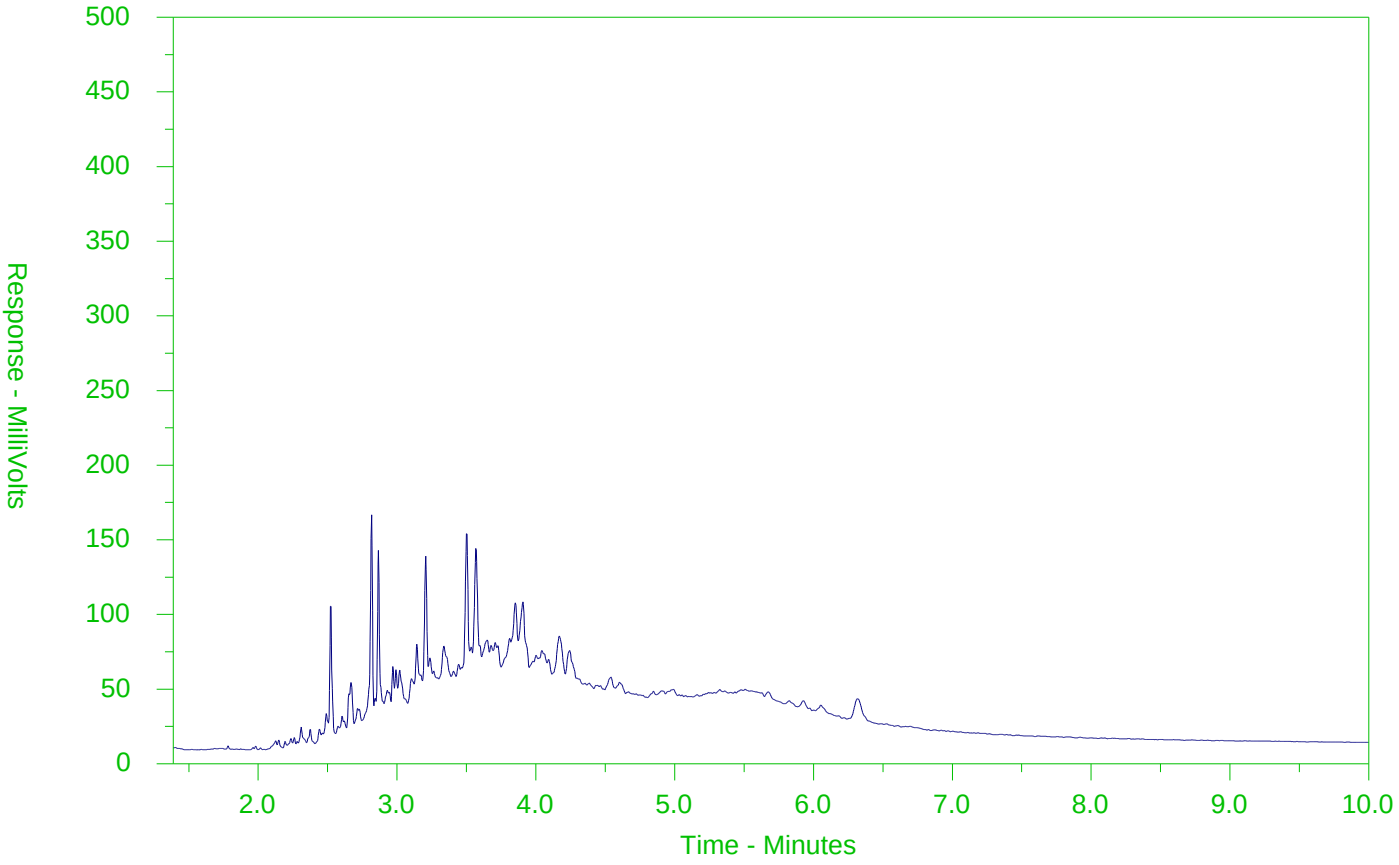
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-5
Client Sample ID: S-11149990-050218-TW-04



←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.

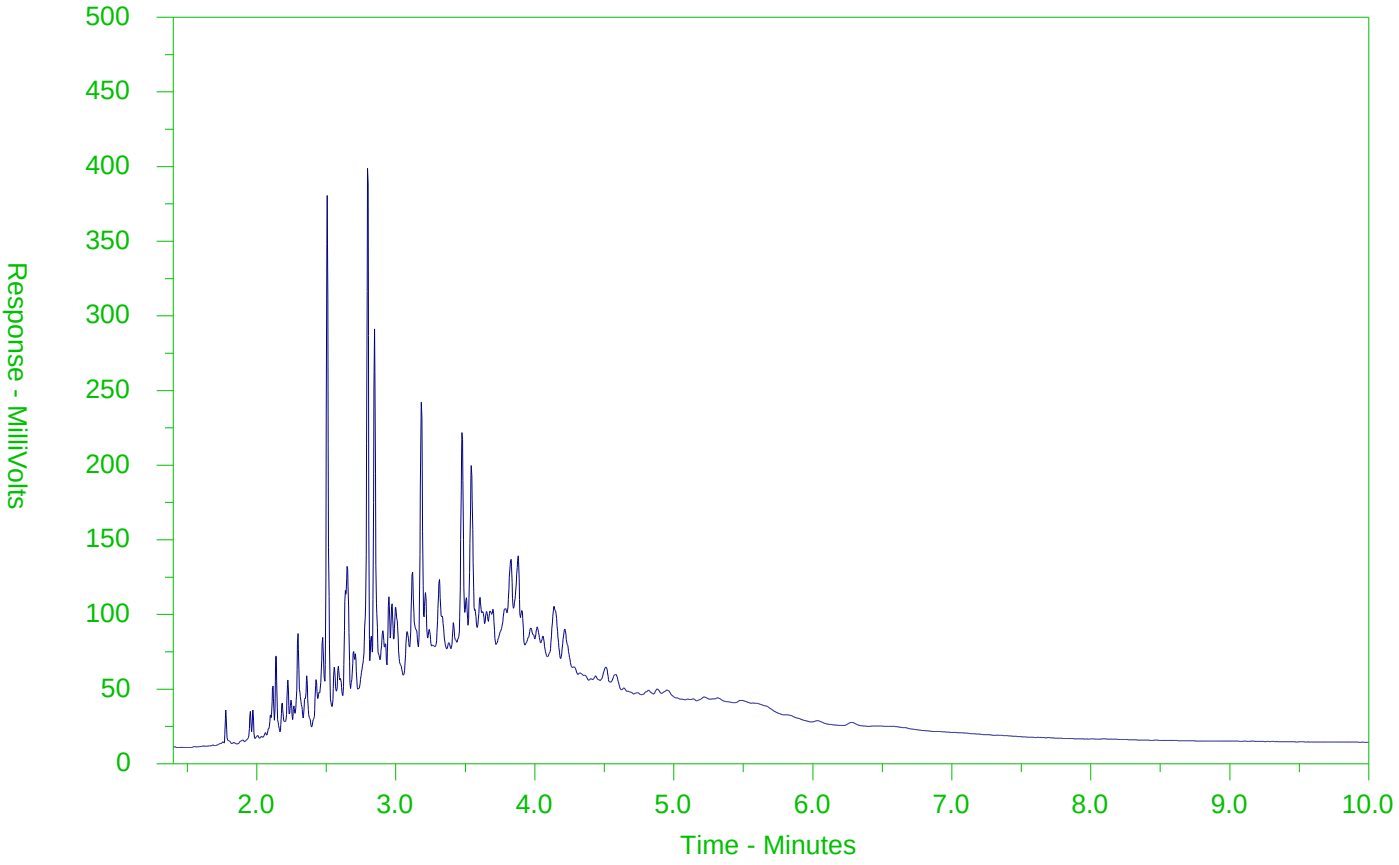
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-6
Client Sample ID: S-11149990-050218-TW-05



←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.

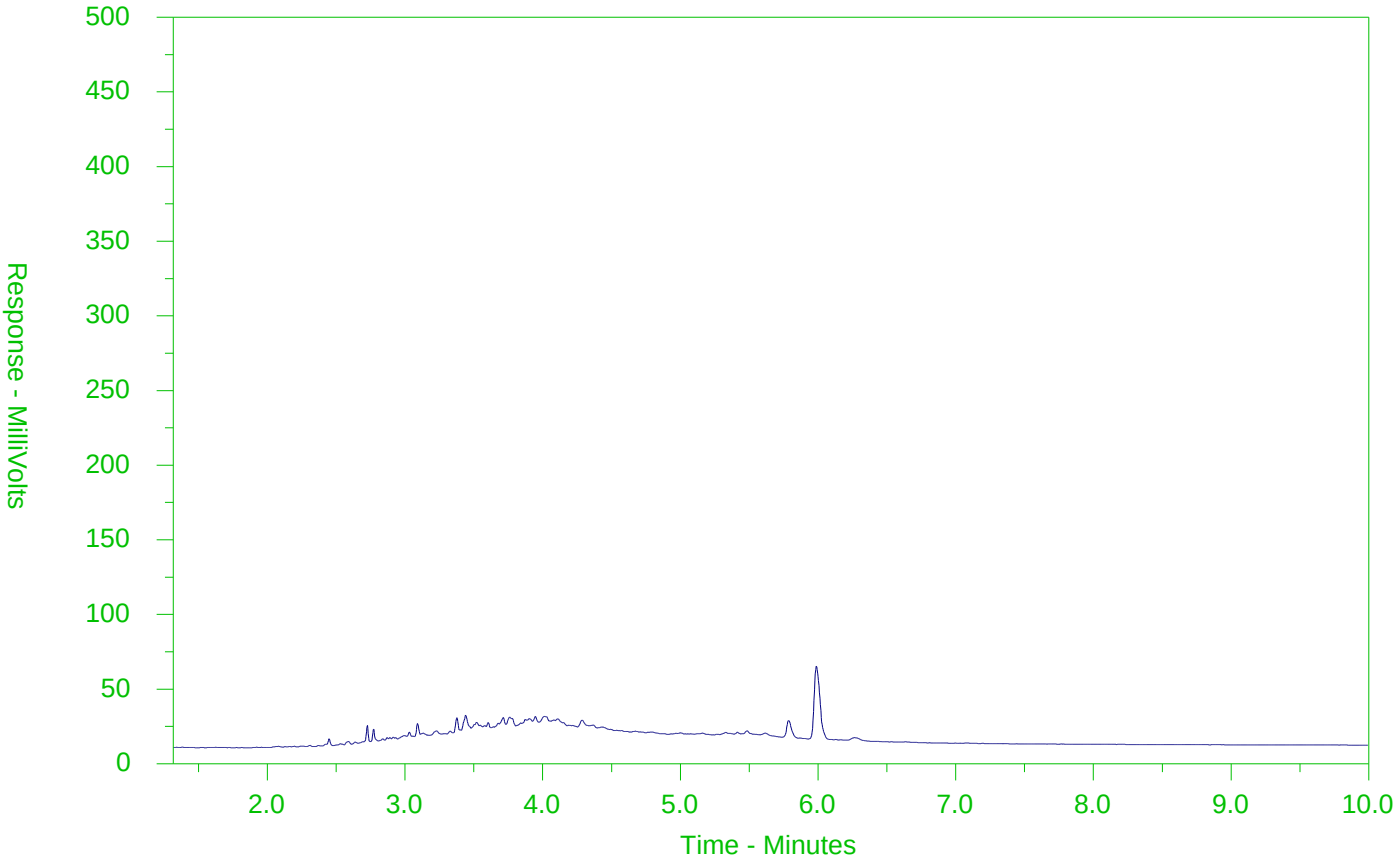
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-7
Client Sample ID: S-11149990-050218-TW-06



←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.

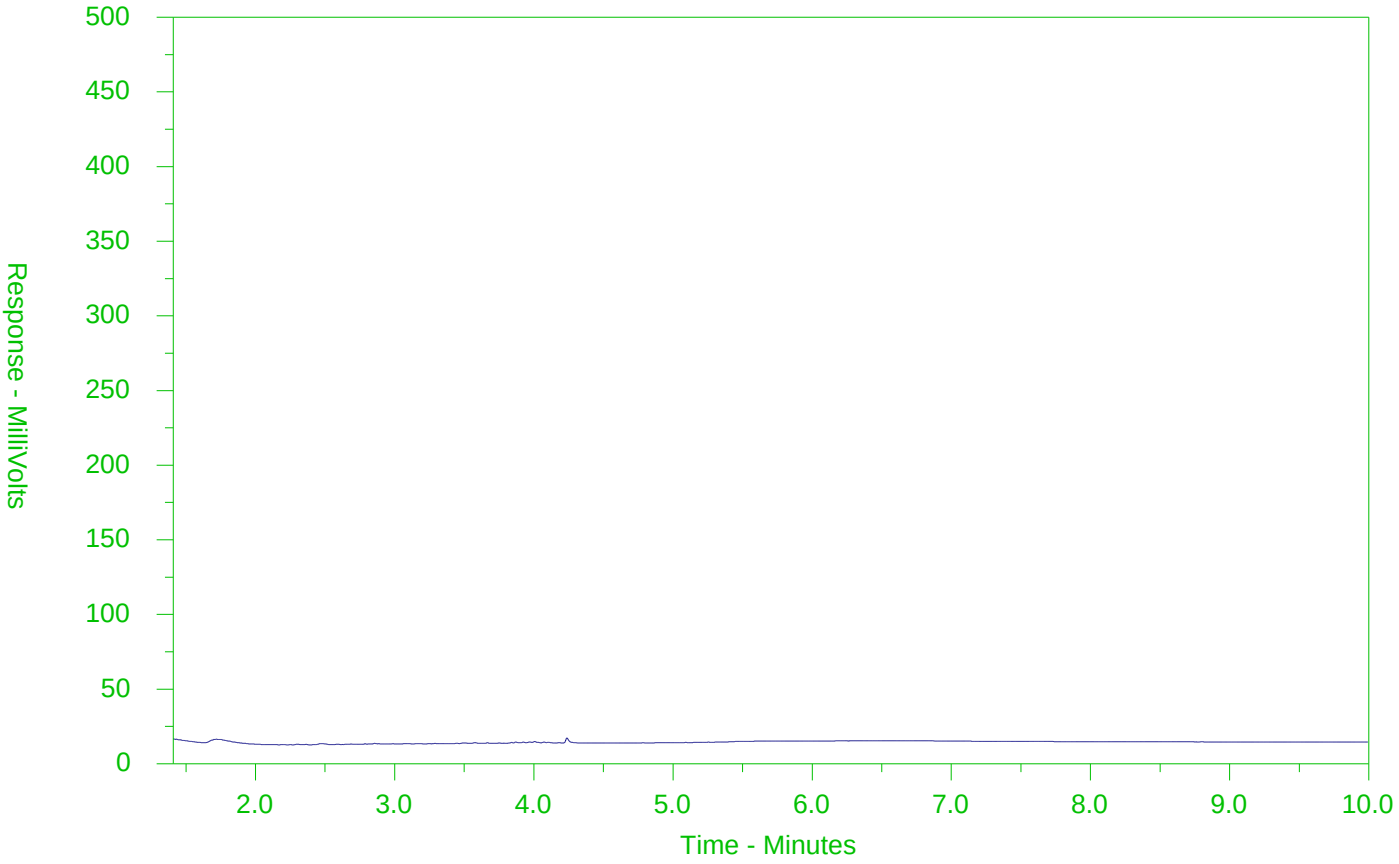
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-8
Client Sample ID: S-11149990-050218-TW-07



←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.

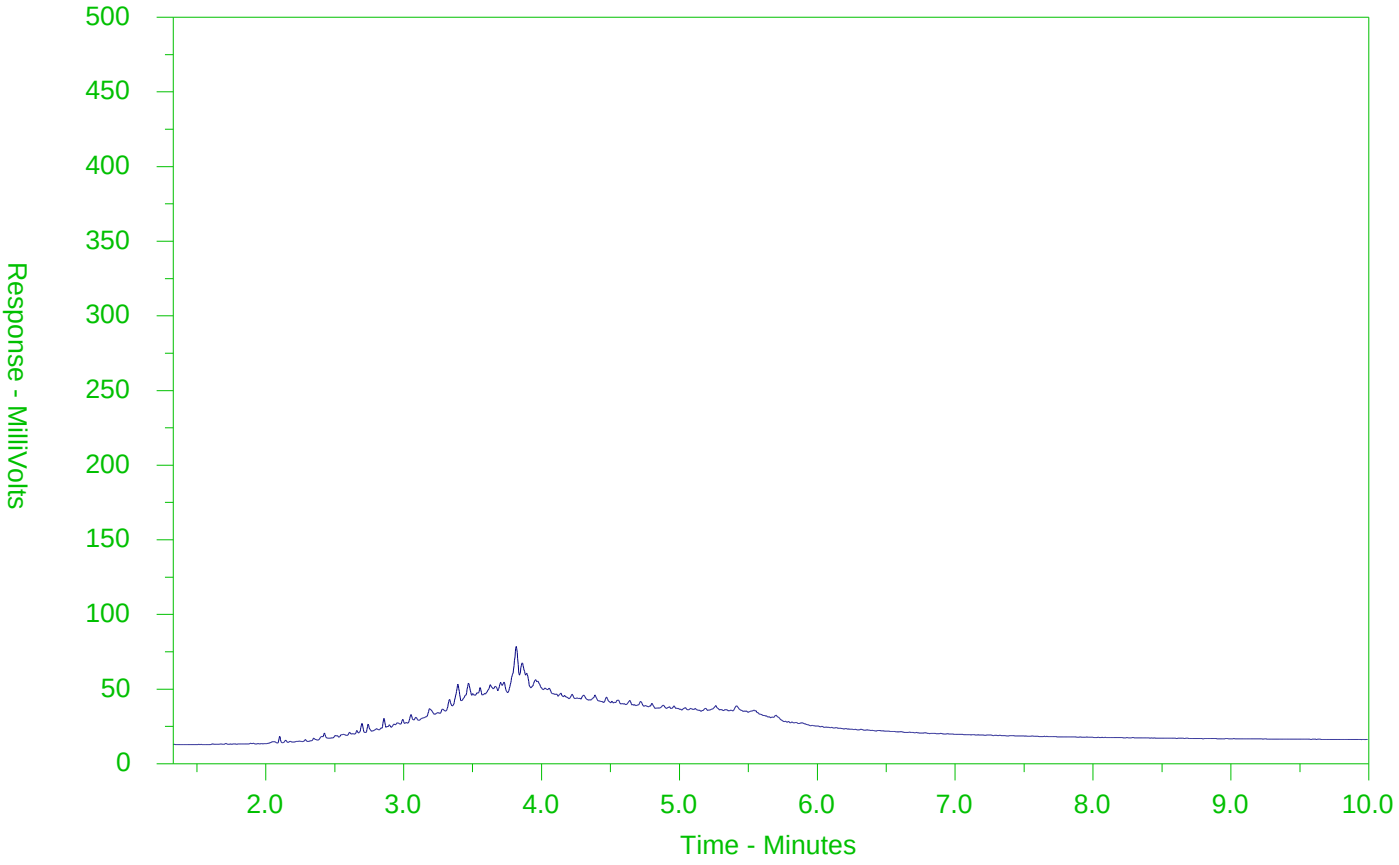
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-9
Client Sample ID: S-11149990-050318-TW-08



←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.

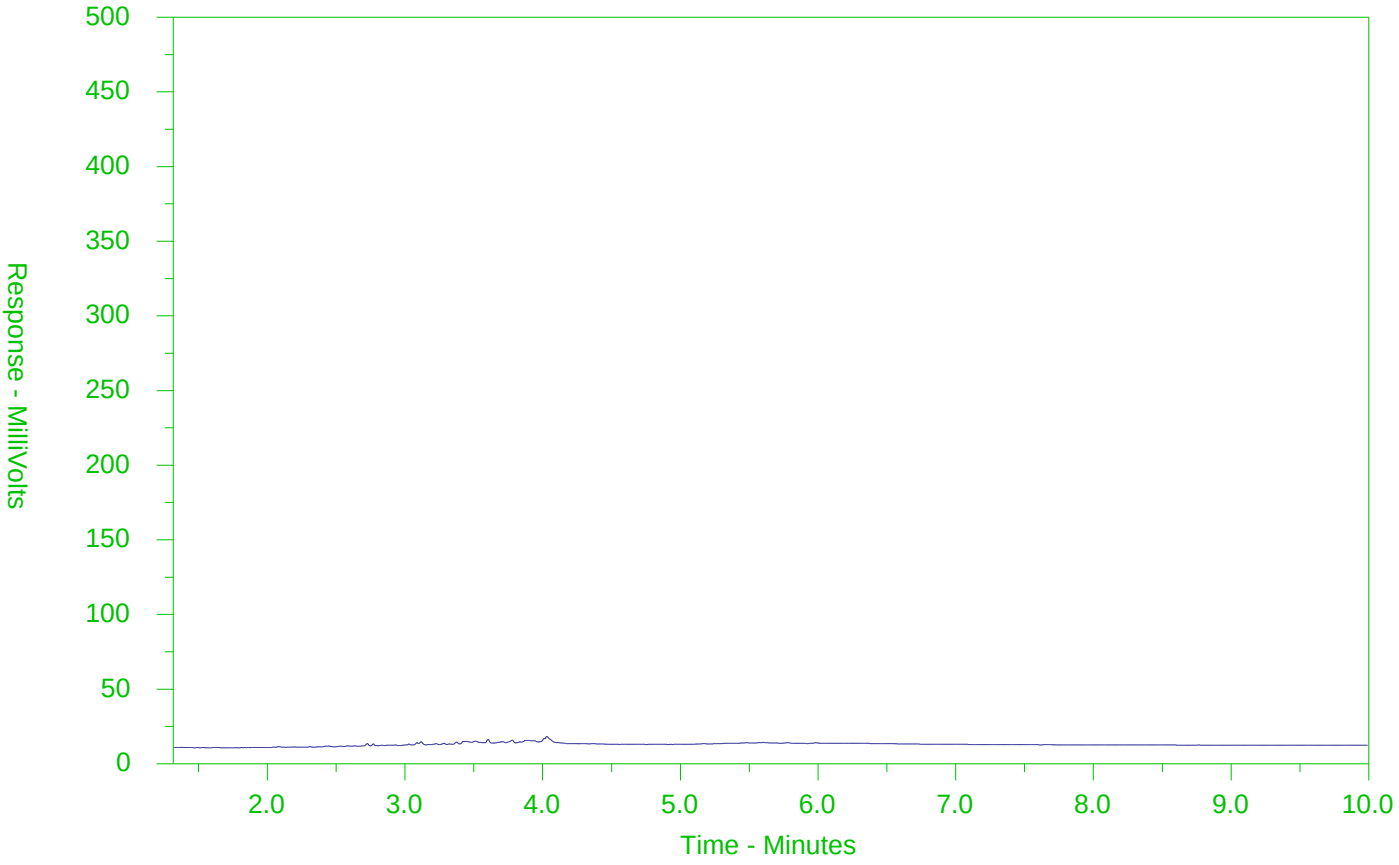
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-11
Client Sample ID: S-11149990-050318-TW-10



←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.

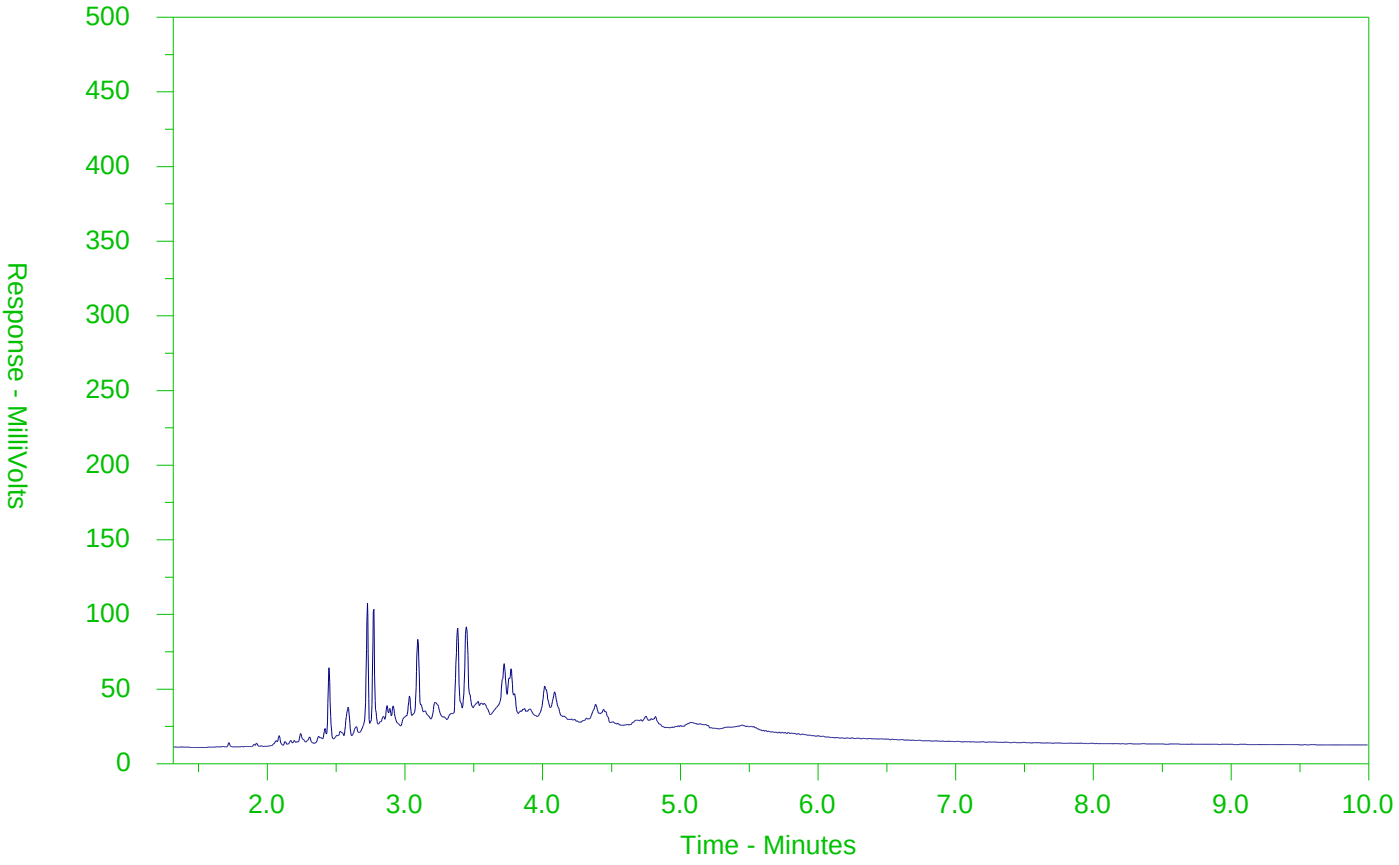
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-12
Client Sample ID: S-11149990-050418-TW-11



←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.

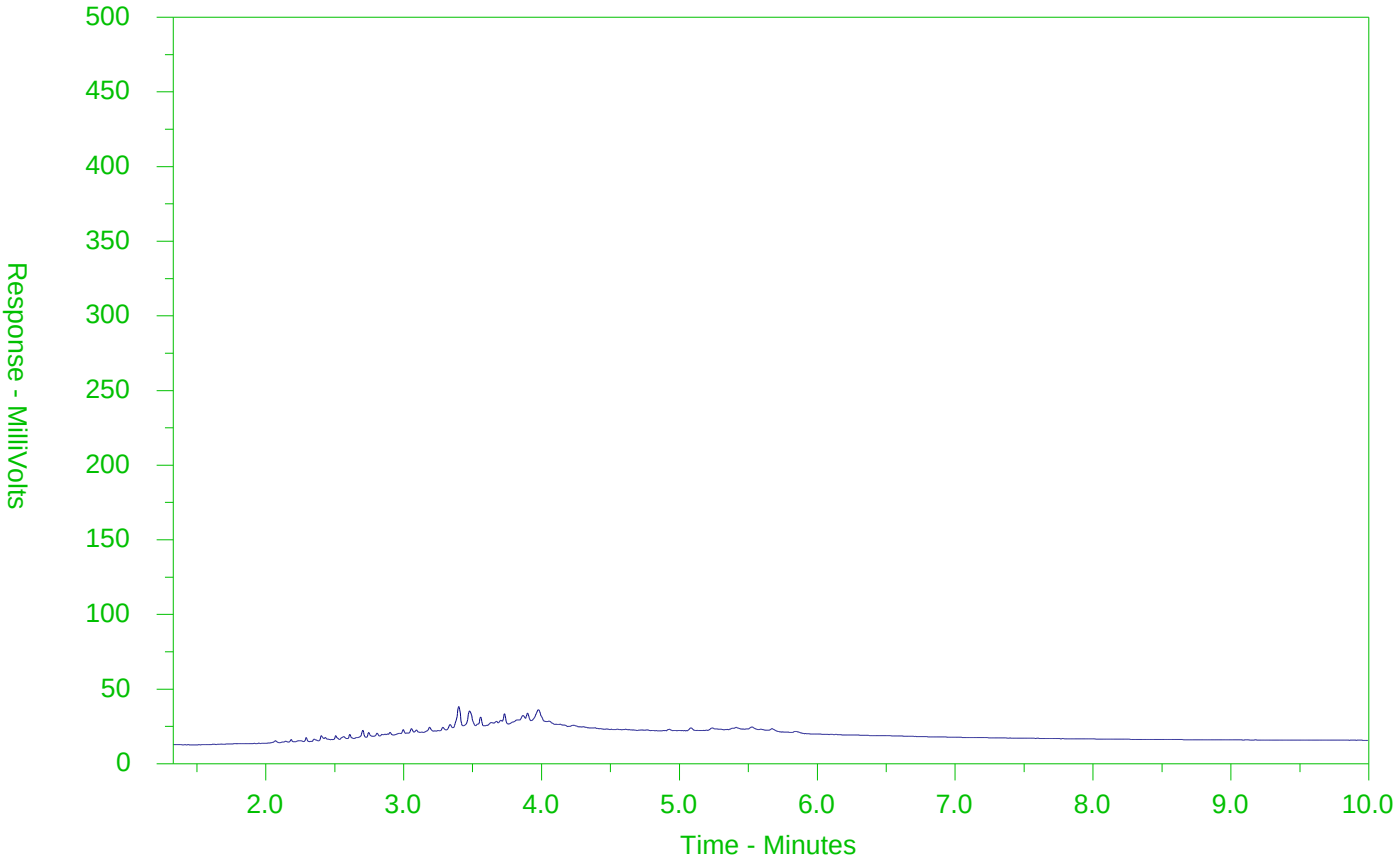
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-14
Client Sample ID: S-11149990-050418-TW-13



←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.

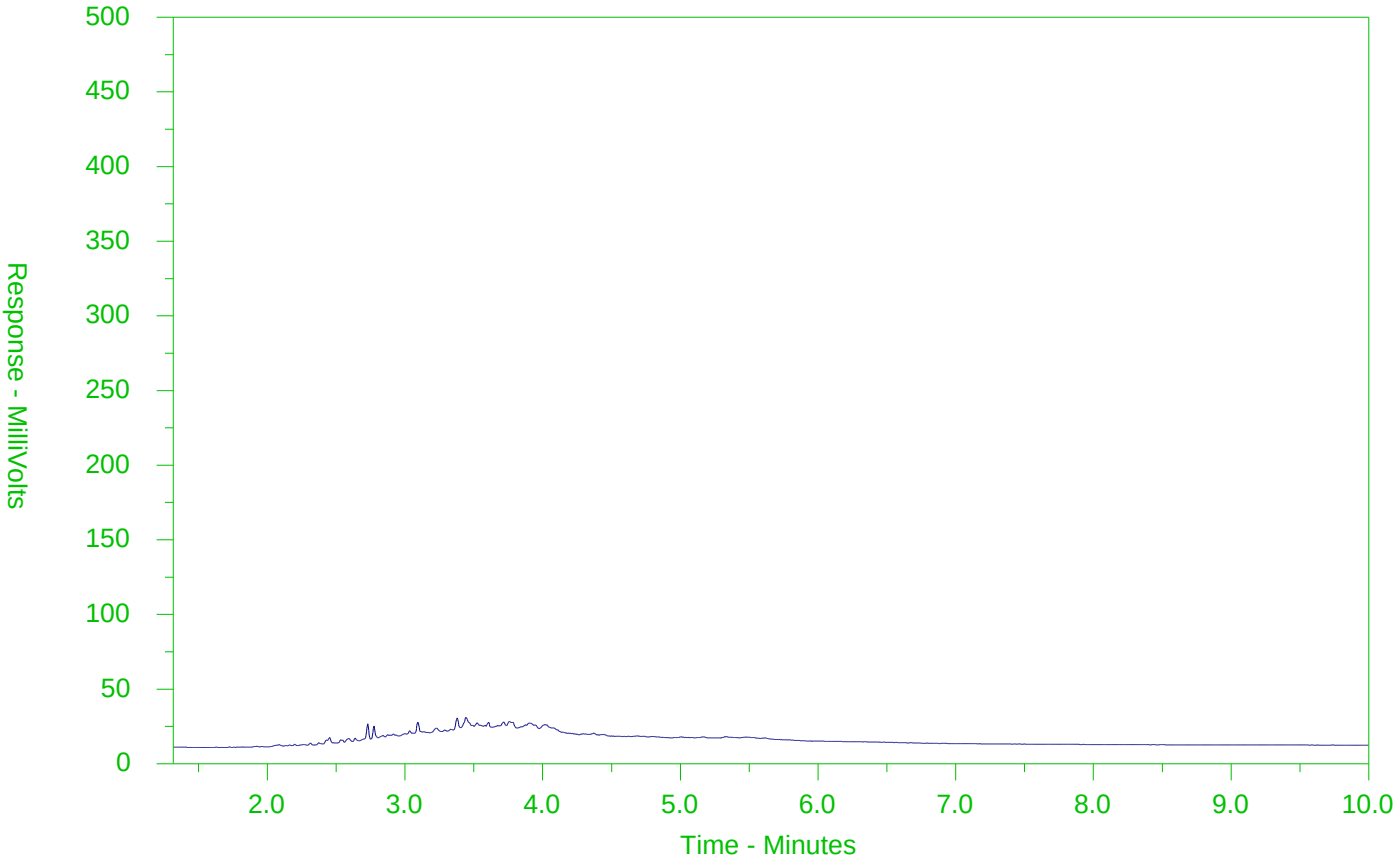
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-16
Client Sample ID: S-11149990-050718-TW-15



←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.

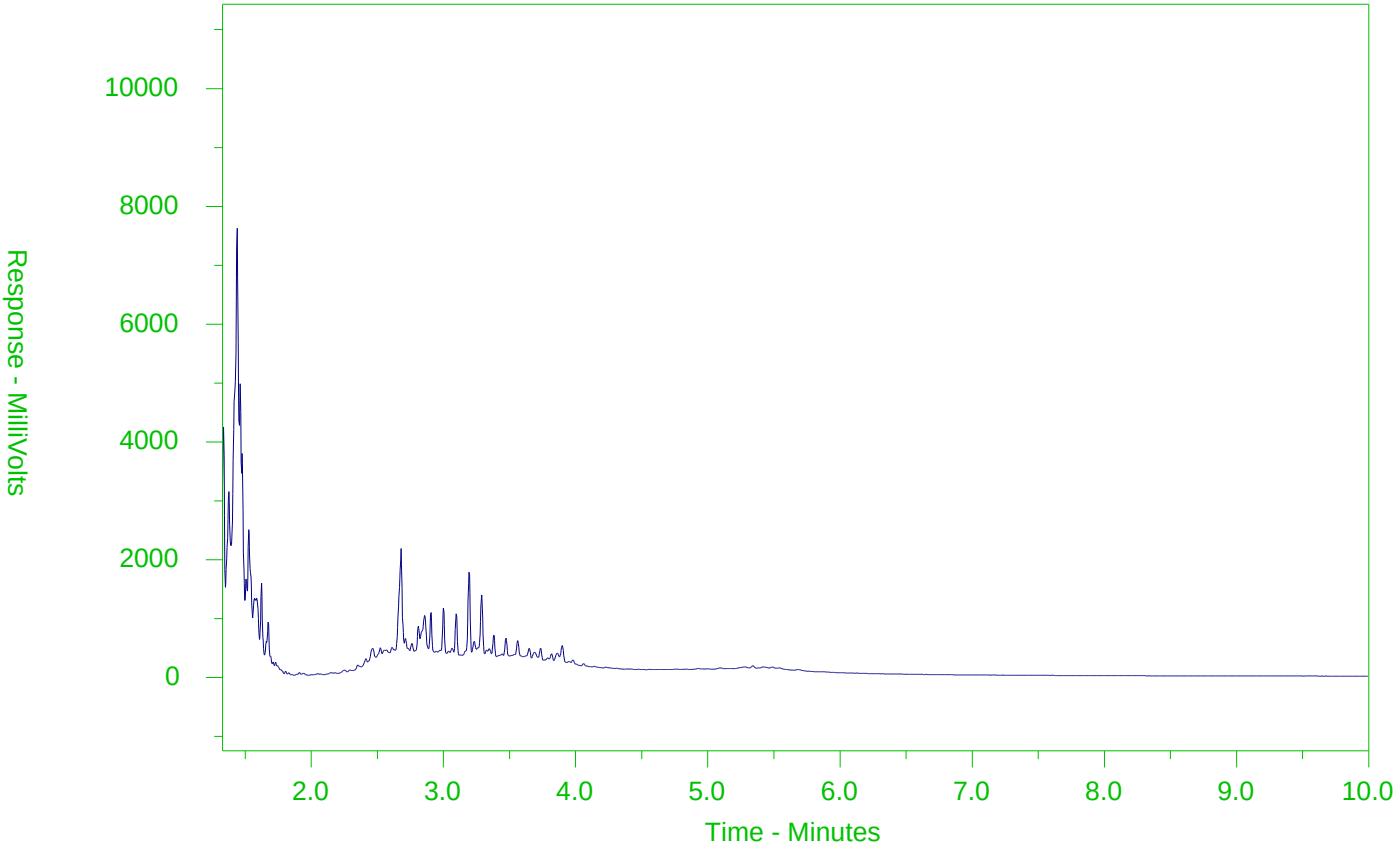
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-18
Client Sample ID: S-11149990-050718-TW-17



←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.

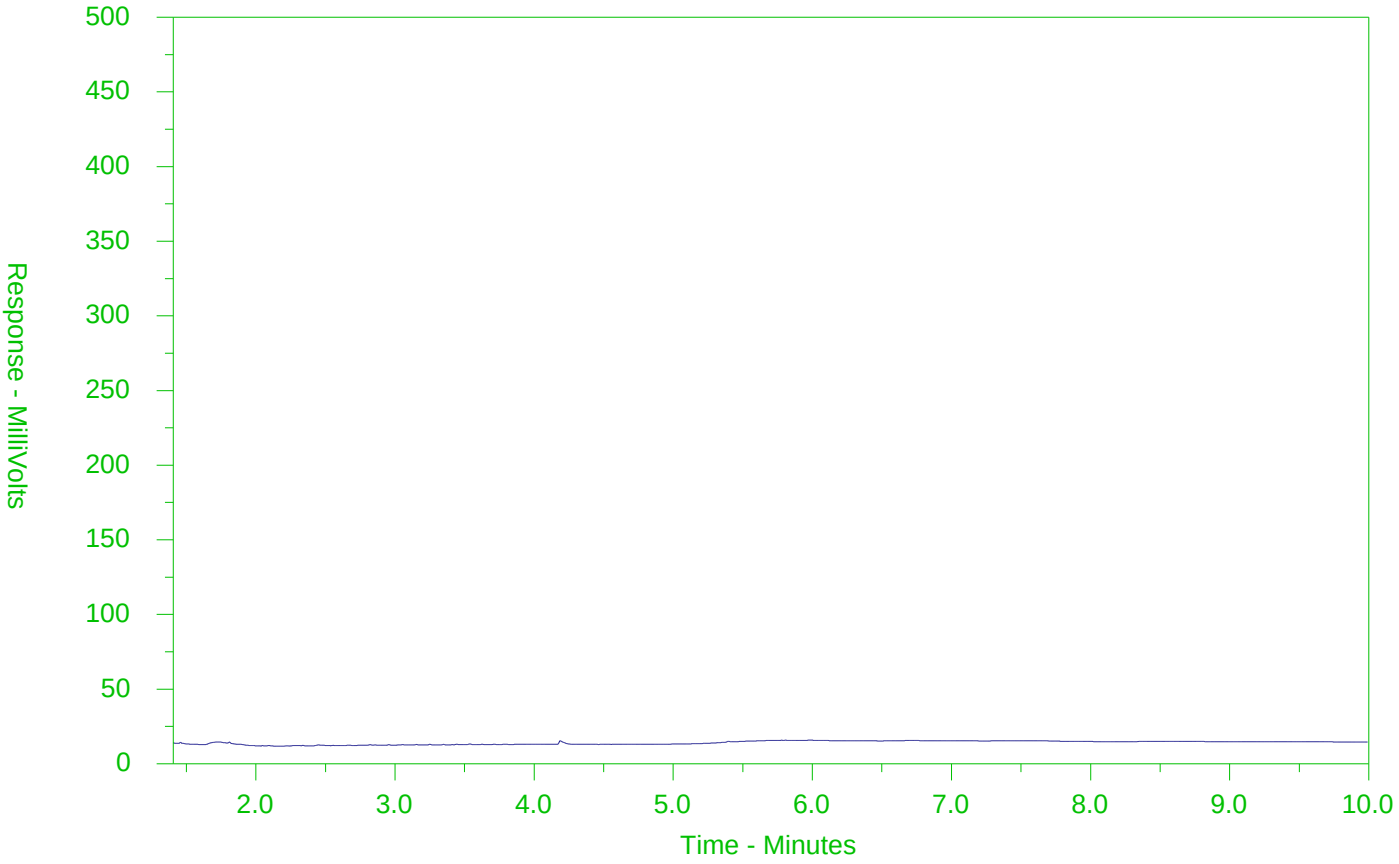
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2091162-19
Client Sample ID: S-11149990-050718-TW-18



←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

L2091162-COFC

COC Number: 17 - 618892

Page 1 of 2

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:	GHD Limited Acct# 13791	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	Regular [R] ☒ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Jennifer Baltzwill	Quality Control (QC) Report with Report ☑ YES ☐ NO	PRIORITY (Business Days): 4 day [P4-20%] ☐ / 3 day [P3-25%] ☐ / 2 day [P2-50%] ☐
Phone:	519-884-0510	☐ 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:	651 Colby Drive	Email 1 or Fax Jennifer.Baltzwill@ghd.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Waterloo/Ontario	Email 2 see PO	
Postal Code:	N2V 1K7	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 #:	11149990-04	Major/Minor Code:	Routing Code:
PO / AFE:	73911036-2	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2091162 08C

ALS Contact: Rick H

Sampler: Tyler W.

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	VOC, F1-F4	SVOCs	153 Mandt Pkg	PCBs	VOC, F1 (Trip Blank)	SAMPLES ON HOLD	Sample is hazardous (please provide further details)	NUMBER OF CONTAINERS
1	TB-11149990-050118-TW-01	01-May-18	~	~					X			
2	S-11149990-050118-TW-01		11:00	S	X	X	X	X				4
3	-02		13:00		X	X	X	X				
4	-03		15:30		X	X	X	X				
5	-050218 -04	02-May-18	10:20		X	X	X	X				
6	-05		16:00		X	X	X	X				
7	-06		12:00		X	X	X	X				
8	-07		16:10							X		
9	-050318 -08	03-May-18	8:30									
10	-09		8:40							X		
11	-10		14:15		X	X	X	X				
12	-050418 -11	04-May-18	8:15		X	X	X	X				

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	
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
	3.6°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Tyler Williams	Date: 8-May-2018	Time: 18:35	Received by:	Date:	Time:	Received by:	Date: 08-May-18	Time: 18:85

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**.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2091162-COFC

COC Number: 17 - 622445

Page 2 of 2

Report To	Contact and company name below will appear on the final report
Company:	GHD Limited Acct#3791
Contact:	Jennifer Balkwill
Phone:	519-884-0510
Company address below will appear on the final report	
Street:	651 Colby Drive
City/Province:	waterloo/Ontario
Postal Code:	N2V 1C2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Jennifer.Balkwill@ghd.com
Email 2: See PO
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ 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] ☒ 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

ALS Account # / Quote #:
Job #: 11149990-04
PO / AFE: 7351036-2
LSD:

ALS Lab Work Order # (lab use only): L2091162 08C

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#
Major/Minor Code: | Routing Code:
Requisitioner:
Location:

ALS Contact: Rick H | Sampler: Tyler W

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	VOC F1-F4	SVOCs	153 Mand I Pkg	PCBs	VOC F1 (Trip Blank)	Grainsize	PH	SAMPLES ON HOLD	Sample is hazardous (please provide further details)	NUMBER OF CONTAINERS
13	S-11149990-050418-TW-12	04-May-18	8:30	S								X		4
14	-13	↓	10:25	↓	X	X	X	X						↓
15	-14	↓	10:40	↓								X		↓
16	-030718- -15	03-May-18	9:05	↓	X	X	X	X						↓
17	-16	↓	9:20	↓								X		↓
18	-17	↓	11:00	↓	X	X	X	X						↓
19	-18	↓	11:30	↓								X		↓
20	-19	↓	9:00	↓						X	X			2
21	-050418- -20	04-May-18	8:10	↓						X	X			↓
22	-21	↓	14:20	↓						X	X			↓

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)

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: 3.6°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Tyler Wille, Tyler Littmaier	Date: 8-May-2018	Time: 18:35	Received by:	Date:	Time:	Received by: [signature]	Date: 08-May-18	Time: 18:35

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.

GHD Limited (Waterloo)
ATTN: JENNIFER BALKWILL
651 COLBY DRIVE
WATERLOO ON N2V 1C2

Date Received: 11-MAY-18
Report Date: 26-JUL-18 09:43 (MT)
Version: FINAL REV. 3

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2093541

Project P.O. #: 73511036-2
Job Reference: 11149990-04
C of C Numbers:
Legal Site Desc:

Comments: Report #1

Rick Hawthorne
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-1 GW-11149990-051118-TW-001 Sampled By: T. WITTMAIER on 11-MAY-18 @ 10:00 Matrix: WATER							
Physical Tests							
Conductivity	3.20		0.0030	mS/cm		15-MAY-18	R4044635
pH	7.26		0.10	pH units		15-MAY-18	R4044635
Anions and Nutrients							
Chloride (Cl)	757	DLHC	2.5	mg/L		16-MAY-18	R4046897
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		18-MAY-18	R4050720
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					15-MAY-18	R4043931
Dissolved Metals Filtration Location	FIELD					15-MAY-18	R4043769
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Barium (Ba)-Dissolved	118	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Boron (B)-Dissolved	380	DLHC	100	ug/L	15-MAY-18	15-MAY-18	R4044327
Cadmium (Cd)-Dissolved	0.153	DLHC	0.050	ug/L	15-MAY-18	15-MAY-18	R4044327
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Copper (Cu)-Dissolved	5.7	DLHC	2.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	15-MAY-18	15-MAY-18	R4044019
Molybdenum (Mo)-Dissolved	0.96	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Selenium (Se)-Dissolved	1.98	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Sodium (Na)-Dissolved	421000	DLHC	500	ug/L	15-MAY-18	15-MAY-18	R4044327
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Uranium (U)-Dissolved	3.08	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Zinc (Zn)-Dissolved	95	DLHC	10	ug/L	15-MAY-18	15-MAY-18	R4044327
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		14-MAY-18	R4043214
Volatile Organic Compounds							
Acetone	<30		30	ug/L		17-MAY-18	R4046328
Benzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Bromodichloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Bromoform	<5.0		5.0	ug/L		17-MAY-18	R4046328
Bromomethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Carbon tetrachloride	<0.20		0.20	ug/L		17-MAY-18	R4046328
Chlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dibromochloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Chloroform	<1.0		1.0	ug/L		17-MAY-18	R4046328
1,2-Dibromoethane	<0.20		0.20	ug/L		17-MAY-18	R4046328

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-1 GW-11149990-051118-TW-001 Sampled By: T. WITTMAIER on 11-MAY-18 @ 10:00 Matrix: WATER							
Volatile Organic Compounds							
1,2-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,3-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,4-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dichlorodifluoromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
1,1-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,2-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methylene Chloride	<5.0		5.0	ug/L		17-MAY-18	R4046328
1,2-Dichloropropane	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		17-MAY-18	
Ethylbenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
n-Hexane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methyl Ethyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
Methyl Isobutyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
MTBE	<2.0		2.0	ug/L		17-MAY-18	R4046328
Styrene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Tetrachloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Toluene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichlorofluoromethane	<5.0		5.0	ug/L		17-MAY-18	R4046328
Vinyl chloride	<0.50		0.50	ug/L		17-MAY-18	R4046328
o-Xylene	<0.30		0.30	ug/L		17-MAY-18	R4046328
m+p-Xylenes	<0.40		0.40	ug/L		17-MAY-18	R4046328
Xylenes (Total)	<0.50		0.50	ug/L		17-MAY-18	
Surrogate: 4-Bromofluorobenzene	94.3		70-130	%		17-MAY-18	R4046328
Surrogate: 1,4-Difluorobenzene	99.9		70-130	%		17-MAY-18	R4046328
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		17-MAY-18	R4046328
F1-BTEX	<25		25	ug/L		22-MAY-18	
F2 (C10-C16)	<100		100	ug/L	17-MAY-18	17-MAY-18	R4047463
F2-Naphth	<100		100	ug/L		22-MAY-18	
F3 (C16-C34)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
F3-PAH	<250		250	ug/L		22-MAY-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-1 GW-11149990-051118-TW-001 Sampled By: T. WITTMAIER on 11-MAY-18 @ 10:00 Matrix: WATER							
Hydrocarbons							
F4 (C34-C50)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-MAY-18	
Chrom. to baseline at nC50	YES				17-MAY-18	17-MAY-18	R4047463
Surrogate: 2-Bromobenzotrifluoride	89.3		60-140	%	17-MAY-18	17-MAY-18	R4047463
Surrogate: 3,4-Dichlorotoluene	82.8		60-140	%		17-MAY-18	R4046328
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Acenaphthylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)pyrene	<0.010		0.010	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(b)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(k)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Chrysene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluorene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		22-MAY-18	
1-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
2-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Naphthalene	<0.050		0.050	ug/L	17-MAY-18	18-MAY-18	R4047455
Phenanthrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Acenaphthene	100.2		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d12-Chrysene	93.3		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d8-Naphthalene	105.4		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Phenanthrene	102.1		60-140	%	17-MAY-18	18-MAY-18	R4047455
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
4-Chloroaniline	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2-Chlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dichlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
Diethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Dimethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dimethylphenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrophenol	<1.0		1.0	ug/L	17-MAY-18	22-MAY-18	R4050092

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-1 GW-11149990-051118-TW-001 Sampled By: T. WITTMAIER on 11-MAY-18 @ 10:00 Matrix: WATER							
Semi-Volatile Organics							
2,4-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,6-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		22-MAY-18	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	17-MAY-18	22-MAY-18	R4050092
Pentachlorophenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
Phenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2-Fluorobiphenyl	91.0		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Nitrobenzene d5	94.3		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Phenol d5	50.6		30-130	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: p-Terphenyl d14	105.5		60-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2,4,6-Tribromophenol	92.7		50-140	%	17-MAY-18	22-MAY-18	R4050092
L2093541-2 GW-11149990-051118-TW-003 Sampled By: T. WITTMAIER on 11-MAY-18 @ 15:20 Matrix: WATER							
Physical Tests							
Conductivity	3.55		0.0030	mS/cm		15-MAY-18	R4044635
pH	7.42		0.10	pH units		15-MAY-18	R4044635
Anions and Nutrients							
Chloride (Cl)	971	DLHC	2.5	mg/L		16-MAY-18	R4046897
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		18-MAY-18	R4050720
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					15-MAY-18	R4043931
Dissolved Metals Filtration Location	FIELD					15-MAY-18	R4043769
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Arsenic (As)-Dissolved	1.1	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Barium (Ba)-Dissolved	202	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Boron (B)-Dissolved	210	DLHC	100	ug/L	15-MAY-18	15-MAY-18	R4044327
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	15-MAY-18	15-MAY-18	R4044327
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	15-MAY-18	15-MAY-18	R4044019
Molybdenum (Mo)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-2 GW-11149990-051118-TW-003 Sampled By: T. WITTMAIER on 11-MAY-18 @ 15:20 Matrix: WATER							
Dissolved Metals							
Sodium (Na)-Dissolved	464000	DLHC	500	ug/L	15-MAY-18	15-MAY-18	R4044327
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Uranium (U)-Dissolved	0.39	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Zinc (Zn)-Dissolved	36	DLHC	10	ug/L	15-MAY-18	15-MAY-18	R4044327
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		14-MAY-18	R4043214
Volatile Organic Compounds							
Acetone	<30		30	ug/L		17-MAY-18	R4046328
Benzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Bromodichloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Bromoform	<5.0		5.0	ug/L		17-MAY-18	R4046328
Bromomethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Carbon tetrachloride	<0.20		0.20	ug/L		17-MAY-18	R4046328
Chlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dibromochloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Chloroform	<1.0		1.0	ug/L		17-MAY-18	R4046328
1,2-Dibromoethane	<0.20		0.20	ug/L		17-MAY-18	R4046328
1,2-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,3-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,4-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dichlorodifluoromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
1,1-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,2-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,2-Dichloroethylene	0.58		0.50	ug/L		17-MAY-18	R4046328
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methylene Chloride	<5.0		5.0	ug/L		17-MAY-18	R4046328
1,2-Dichloropropane	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		17-MAY-18	
Ethylbenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
n-Hexane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methyl Ethyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
Methyl Isobutyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
MTBE	<2.0		2.0	ug/L		17-MAY-18	R4046328
Styrene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Tetrachloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-2 GW-11149990-051118-TW-003 Sampled By: T. WITTMAIER on 11-MAY-18 @ 15:20 Matrix: WATER							
Volatile Organic Compounds							
Toluene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichlorofluoromethane	<5.0		5.0	ug/L		17-MAY-18	R4046328
Vinyl chloride	<0.50		0.50	ug/L		17-MAY-18	R4046328
o-Xylene	<0.30		0.30	ug/L		17-MAY-18	R4046328
m+p-Xylenes	<0.40		0.40	ug/L		17-MAY-18	R4046328
Xylenes (Total)	<0.50		0.50	ug/L		17-MAY-18	
Surrogate: 4-Bromofluorobenzene	94.6		70-130	%		17-MAY-18	R4046328
Surrogate: 1,4-Difluorobenzene	99.8		70-130	%		17-MAY-18	R4046328
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		17-MAY-18	R4046328
F1-BTEX	<25		25	ug/L		22-MAY-18	
F2 (C10-C16)	<100		100	ug/L	17-MAY-18	17-MAY-18	R4047463
F2-Naphth	<100		100	ug/L		22-MAY-18	
F3 (C16-C34)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
F3-PAH	<250		250	ug/L		22-MAY-18	
F4 (C34-C50)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-MAY-18	
Chrom. to baseline at nC50	YES				17-MAY-18	17-MAY-18	R4047463
Surrogate: 2-Bromobenzotrifluoride	81.7		60-140	%	17-MAY-18	17-MAY-18	R4047463
Surrogate: 3,4-Dichlorotoluene	83.4		60-140	%		17-MAY-18	R4046328
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Acenaphthylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)pyrene	<0.010		0.010	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(b)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(k)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Chrysene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluorene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		22-MAY-18	
1-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
2-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Naphthalene	<0.050		0.050	ug/L	17-MAY-18	18-MAY-18	R4047455

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-2 GW-11149990-051118-TW-003 Sampled By: T. WITTMAIER on 11-MAY-18 @ 15:20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Phenanthrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Acenaphthene	102.3		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d12-Chrysene	90.5		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d8-Naphthalene	105.9		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Phenanthrene	105.4		60-140	%	17-MAY-18	18-MAY-18	R4047455
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
4-Chloroaniline	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2-Chlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dichlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
Diethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Dimethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dimethylphenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrophenol	<1.0		1.0	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,6-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		22-MAY-18	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	17-MAY-18	22-MAY-18	R4050092
Pentachlorophenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
Phenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2-Fluorobiphenyl	89.0		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Nitrobenzene d5	93.4		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Phenol d5	51.3		30-130	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: p-Terphenyl d14	104.6		60-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2,4,6-Tribromophenol	96.7		50-140	%	17-MAY-18	22-MAY-18	R4050092
L2093541-4 GW-11149990-051118-TW-005 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Physical Tests							
Conductivity	4.10		0.0030	mS/cm		15-MAY-18	R4044635
Hardness (as CaCO3)	553000		1300	ug/L		18-MAY-18	
pH	7.69		0.10	pH units		15-MAY-18	R4044635
Total Dissolved Solids	2410	DLDS	20	mg/L		16-MAY-18	R4046600
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	310		10	mg/L		17-MAY-18	R4046936

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-4 GW-11149990-051118-TW-005 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Anions and Nutrients							
Ammonia, Total (as N)	3.25	DLHC	0.10	mg/L		16-MAY-18	R4046688
Chloride (Cl)	1180	DLDS	2.5	mg/L		16-MAY-18	R4046897
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		16-MAY-18	R4046897
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		16-MAY-18	R4046897
Total Kjeldahl Nitrogen	3.77		0.15	mg/L	16-MAY-18	17-MAY-18	R4046628
Phosphorus, Total	0.0265		0.0030	mg/L	15-MAY-18	16-MAY-18	R4045211
Sulfate (SO4)	97.1	DLDS	1.5	mg/L		16-MAY-18	R4046897
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		18-MAY-18	R4050720
Organic / Inorganic Carbon							
Dissolved Organic Carbon	7.7	DLM	5.0	mg/L		16-MAY-18	R4046482
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					15-MAY-18	R4043931
Dissolved Metals Filtration Location	FIELD					15-MAY-18	R4043769
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Arsenic (As)-Dissolved	2.6	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Barium (Ba)-Dissolved	411	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Boron (B)-Dissolved	1580	DLHC	100	ug/L	15-MAY-18	15-MAY-18	R4044327
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	15-MAY-18	15-MAY-18	R4044327
Calcium (Ca)-Dissolved	158000	DLHC	500	ug/L	15-MAY-18	15-MAY-18	R4044327
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Copper (Cu)-Dissolved	2.0	DLHC	2.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Iron (Fe)-Dissolved	6060	DLHC	100	ug/L	15-MAY-18	15-MAY-18	R4044327
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Magnesium (Mg)-Dissolved	38700	DLHC	50	ug/L	15-MAY-18	15-MAY-18	R4044327
Manganese (Mn)-Dissolved	1380	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	15-MAY-18	15-MAY-18	R4044019
Molybdenum (Mo)-Dissolved	2.56	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Sodium (Na)-Dissolved	627000	DLHC	500	ug/L	15-MAY-18	15-MAY-18	R4044327
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Uranium (U)-Dissolved	0.53	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	15-MAY-18	15-MAY-18	R4044327
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		14-MAY-18	R4043214
Aggregate Organics							
Phenols (4AAP)	0.0016		0.0010	mg/L		14-MAY-18	R4043900

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-4 GW-11149990-051118-TW-005 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Aggregate Organics **Volatile Organic Compounds**							
Acetone	<30		30	ug/L		17-MAY-18	R4046328
Benzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Bromodichloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Bromoform	<5.0		5.0	ug/L		17-MAY-18	R4046328
Bromomethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Carbon tetrachloride	<0.20		0.20	ug/L		17-MAY-18	R4046328
Chlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dibromochloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Chloroform	<1.0		1.0	ug/L		17-MAY-18	R4046328
1,2-Dibromoethane	<0.20		0.20	ug/L		17-MAY-18	R4046328
1,2-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,3-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,4-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dichlorodifluoromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
1,1-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,2-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methylene Chloride	<5.0		5.0	ug/L		17-MAY-18	R4046328
1,2-Dichloropropane	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		17-MAY-18	
Ethylbenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
n-Hexane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methyl Ethyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
Methyl Isobutyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
MTBE	<2.0		2.0	ug/L		17-MAY-18	R4046328
Styrene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Tetrachloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Toluene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichlorofluoromethane	<5.0		5.0	ug/L		17-MAY-18	R4046328
Vinyl chloride	<0.50		0.50	ug/L		17-MAY-18	R4046328
o-Xylene	<0.30		0.30	ug/L		17-MAY-18	R4046328

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-4 GW-11149990-051118-TW-005 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Volatile Organic Compounds							
m+p-Xylenes	<0.40		0.40	ug/L		17-MAY-18	R4046328
Xylenes (Total)	<0.50		0.50	ug/L		17-MAY-18	
Surrogate: 4-Bromofluorobenzene	93.3		70-130	%		17-MAY-18	R4046328
Surrogate: 1,4-Difluorobenzene	100.6		70-130	%		17-MAY-18	R4046328
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		17-MAY-18	R4046328
F1-BTEX	<25		25	ug/L		22-MAY-18	
F2 (C10-C16)	<100		100	ug/L	17-MAY-18	17-MAY-18	R4047463
F2-Naphth	<100		100	ug/L		22-MAY-18	
F3 (C16-C34)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
F3-PAH	<250		250	ug/L		22-MAY-18	
F4 (C34-C50)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-MAY-18	
Chrom. to baseline at nC50	YES				17-MAY-18	17-MAY-18	R4047463
Surrogate: 2-Bromobenzotrifluoride	81.2		60-140	%	17-MAY-18	17-MAY-18	R4047463
Surrogate: 3,4-Dichlorotoluene	92.5		60-140	%		17-MAY-18	R4046328
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	0.139		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Acenaphthylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)pyrene	<0.010		0.010	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(b)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(k)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Chrysene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluorene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		22-MAY-18	
1-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
2-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Naphthalene	<0.050		0.050	ug/L	17-MAY-18	18-MAY-18	R4047455
Phenanthrene	0.025		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Acenaphthene	98.6		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d12-Chrysene	91.8		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d8-Naphthalene	103.0		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Phenanthrene	101.9		60-140	%	17-MAY-18	18-MAY-18	R4047455
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-4 GW-11149990-051118-TW-005 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Semi-Volatile Organics							
4-Chloroaniline	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2-Chlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dichlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
Diethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Dimethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dimethylphenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrophenol	<1.0		1.0	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,6-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		22-MAY-18	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	17-MAY-18	22-MAY-18	R4050092
Pentachlorophenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
Phenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2-Fluorobiphenyl	88.9		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Nitrobenzene d5	95.1		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Phenol d5	49.3		30-130	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: p-Terphenyl d14	94.3		60-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2,4,6-Tribromophenol	100.2		50-140	%	17-MAY-18	22-MAY-18	R4050092
L2093541-5 GW-11149990-051118-TW-006 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Physical Tests							
Conductivity	4.13		0.0030	mS/cm		15-MAY-18	R4044635
Hardness (as CaCO3)	540000		1300	ug/L		18-MAY-18	
pH	7.72		0.10	pH units		15-MAY-18	R4044635
Total Dissolved Solids	2380	DLDS	20	mg/L		16-MAY-18	R4046600
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	310		10	mg/L		17-MAY-18	R4046936
Ammonia, Total (as N)	3.13	DLHC	0.10	mg/L		16-MAY-18	R4046688
Chloride (Cl)	1170	DLDS	2.5	mg/L		16-MAY-18	R4046897
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		16-MAY-18	R4046897
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		16-MAY-18	R4046897
Total Kjeldahl Nitrogen	3.40		0.15	mg/L	17-MAY-18	18-MAY-18	R4047847
Phosphorus, Total	0.0343		0.0030	mg/L	15-MAY-18	16-MAY-18	R4045211
Sulfate (SO4)	96.7	DLDS	1.5	mg/L		16-MAY-18	R4046897
Cyanides							

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-5 GW-11149990-051118-TW-006 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		18-MAY-18	R4050720
Organic / Inorganic Carbon							
Dissolved Organic Carbon	5.2	DLM	5.0	mg/L		16-MAY-18	R4046482
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					15-MAY-18	R4043931
Dissolved Metals Filtration Location	FIELD					15-MAY-18	R4043769
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Arsenic (As)-Dissolved	2.5	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Barium (Ba)-Dissolved	416	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Boron (B)-Dissolved	1640	DLHC	100	ug/L	15-MAY-18	15-MAY-18	R4044327
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	15-MAY-18	15-MAY-18	R4044327
Calcium (Ca)-Dissolved	156000	DLHC	500	ug/L	15-MAY-18	15-MAY-18	R4044327
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Iron (Fe)-Dissolved	5980	DLHC	100	ug/L	15-MAY-18	15-MAY-18	R4044327
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Magnesium (Mg)-Dissolved	36200	DLHC	50	ug/L	15-MAY-18	15-MAY-18	R4044327
Manganese (Mn)-Dissolved	1360	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	15-MAY-18	15-MAY-18	R4044019
Molybdenum (Mo)-Dissolved	2.52	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	15-MAY-18	15-MAY-18	R4044327
Sodium (Na)-Dissolved	606000	DLHC	500	ug/L	15-MAY-18	15-MAY-18	R4044327
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Uranium (U)-Dissolved	0.55	DLHC	0.10	ug/L	15-MAY-18	15-MAY-18	R4044327
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	15-MAY-18	15-MAY-18	R4044327
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	15-MAY-18	15-MAY-18	R4044327
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		14-MAY-18	R4043214
Aggregate Organics							
Phenols (4AAP)	0.0021		0.0010	mg/L		14-MAY-18	R4043900
Volatile Organic Compounds							
Acetone	<30		30	ug/L		17-MAY-18	R4046328
Benzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Bromodichloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Bromoform	<5.0		5.0	ug/L		17-MAY-18	R4046328
Bromomethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Carbon tetrachloride	<0.20		0.20	ug/L		17-MAY-18	R4046328
Chlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-5 GW-11149990-051118-TW-006 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Volatile Organic Compounds							
Dibromochloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Chloroform	<1.0		1.0	ug/L		17-MAY-18	R4046328
1,2-Dibromoethane	<0.20		0.20	ug/L		17-MAY-18	R4046328
1,2-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,3-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,4-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dichlorodifluoromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
1,1-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,2-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methylene Chloride	<5.0		5.0	ug/L		17-MAY-18	R4046328
1,2-Dichloropropane	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		17-MAY-18	
Ethylbenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
n-Hexane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methyl Ethyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
Methyl Isobutyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
MTBE	<2.0		2.0	ug/L		17-MAY-18	R4046328
Styrene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Tetrachloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Toluene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichlorofluoromethane	<5.0		5.0	ug/L		17-MAY-18	R4046328
Vinyl chloride	<0.50		0.50	ug/L		17-MAY-18	R4046328
o-Xylene	<0.30		0.30	ug/L		17-MAY-18	R4046328
m+p-Xylenes	<0.40		0.40	ug/L		17-MAY-18	R4046328
Xylenes (Total)	<0.50		0.50	ug/L		17-MAY-18	
Surrogate: 4-Bromofluorobenzene	93.0		70-130	%		17-MAY-18	R4046328
Surrogate: 1,4-Difluorobenzene	99.8		70-130	%		17-MAY-18	R4046328
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		17-MAY-18	R4046328
F1-BTEX	<25		25	ug/L		22-MAY-18	
F2 (C10-C16)	<100		100	ug/L	17-MAY-18	17-MAY-18	R4047463

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-5 GW-11149990-051118-TW-006 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Hydrocarbons							
F2-Naphth	<100		100	ug/L		22-MAY-18	
F3 (C16-C34)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
F3-PAH	<250		250	ug/L		22-MAY-18	
F4 (C34-C50)	<250		250	ug/L	17-MAY-18	17-MAY-18	R4047463
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-MAY-18	
Chrom. to baseline at nC50	YES				17-MAY-18	17-MAY-18	R4047463
Surrogate: 2-Bromobenzotrifluoride	83.4		60-140	%	17-MAY-18	17-MAY-18	R4047463
Surrogate: 3,4-Dichlorotoluene	86.9		60-140	%		17-MAY-18	R4046328
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	0.144		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Acenaphthylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(a)pyrene	<0.010		0.010	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(b)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Benzo(k)fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Chrysene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluoranthene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Fluorene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		22-MAY-18	
1-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
2-Methylnaphthalene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Naphthalene	<0.050		0.050	ug/L	17-MAY-18	18-MAY-18	R4047455
Phenanthrene	0.025		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Pyrene	<0.020		0.020	ug/L	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Acenaphthene	101.7		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d12-Chrysene	95.7		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d8-Naphthalene	106.5		60-140	%	17-MAY-18	18-MAY-18	R4047455
Surrogate: d10-Phenanthrene	105.7		60-140	%	17-MAY-18	18-MAY-18	R4047455
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
4-Chloroaniline	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2-Chlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dichlorophenol	<0.30		0.30	ug/L	17-MAY-18	22-MAY-18	R4050092
Diethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-5 GW-11149990-051118-TW-006 Sampled By: T. WITTMAIER on 11-MAY-18 @ 12:50 Matrix: WATER							
Semi-Volatile Organics							
Dimethylphthalate	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dimethylphenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrophenol	<1.0		1.0	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,6-Dinitrotoluene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		22-MAY-18	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	17-MAY-18	22-MAY-18	R4050092
Pentachlorophenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
Phenol	<0.50		0.50	ug/L	17-MAY-18	22-MAY-18	R4050092
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2-Fluorobiphenyl	87.9		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Nitrobenzene d5	93.9		50-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: Phenol d5	48.8		30-130	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: p-Terphenyl d14	96.8		60-140	%	17-MAY-18	22-MAY-18	R4050092
Surrogate: 2,4,6-Tribromophenol	98.4		50-140	%	17-MAY-18	22-MAY-18	R4050092
L2093541-14 TB-11149990-051118-TW-001 Sampled By: T. WITTMAIER on 11-MAY-18 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		17-MAY-18	R4046328
Benzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Bromodichloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Bromoform	<5.0		5.0	ug/L		17-MAY-18	R4046328
Bromomethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Carbon tetrachloride	<0.20		0.20	ug/L		17-MAY-18	R4046328
Chlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dibromochloromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
Chloroform	<1.0		1.0	ug/L		17-MAY-18	R4046328
1,2-Dibromoethane	<0.20		0.20	ug/L		17-MAY-18	R4046328
1,2-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,3-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,4-Dichlorobenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Dichlorodifluoromethane	<2.0		2.0	ug/L		17-MAY-18	R4046328
1,1-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,2-Dichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methylene Chloride	<5.0		5.0	ug/L		17-MAY-18	R4046328
1,2-Dichloropropane	<0.50		0.50	ug/L		17-MAY-18	R4046328

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2093541-14 TB-11149990-051118-TW-001 Sampled By: T. WITTMAIER on 11-MAY-18 Matrix: WATER							
Volatile Organic Compounds							
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		17-MAY-18	R4046328
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		17-MAY-18	
Ethylbenzene	<0.50		0.50	ug/L		17-MAY-18	R4046328
n-Hexane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Methyl Ethyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
Methyl Isobutyl Ketone	<20		20	ug/L		17-MAY-18	R4046328
MTBE	<2.0		2.0	ug/L		17-MAY-18	R4046328
Styrene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Tetrachloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Toluene	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,1-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
1,1,2-Trichloroethane	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichloroethylene	<0.50		0.50	ug/L		17-MAY-18	R4046328
Trichlorofluoromethane	<5.0		5.0	ug/L		17-MAY-18	R4046328
Vinyl chloride	<0.50		0.50	ug/L		17-MAY-18	R4046328
o-Xylene	<0.30		0.30	ug/L		17-MAY-18	R4046328
m+p-Xylenes	<0.40		0.40	ug/L		17-MAY-18	R4046328
Xylenes (Total)	<0.50		0.50	ug/L		17-MAY-18	
Surrogate: 4-Bromofluorobenzene	92.8		70-130	%		17-MAY-18	R4046328
Surrogate: 1,4-Difluorobenzene	99.6		70-130	%		17-MAY-18	R4046328
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		17-MAY-18	R4046328
F1-BTEX	<25		25	ug/L		17-MAY-18	
Surrogate: 3,4-Dichlorotoluene	99.4		60-140	%		17-MAY-18	R4046328

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Boron (B)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L2093541-1, -2, -4, -5
Matrix Spike	Ammonia, Total (as N)	MS-B	L2093541-4, -5

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

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).

ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

C-DIS-ORG-WT	Water	Dissolved Organic Carbon	APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

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).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
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).

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

Reference Information

Parameters

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 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).

HARDNESS-CALC-WT Water Hardness APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

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

NH3-WT Water Ammonia, Total as N EPA 350.1

Sample is measured colorimetrically. When sample is turbid a distillation step is required, sample is distilled into a solution of boric acid and measured colorimetrically.

NO2-IC-WT Water Nitrite in Water by IC EPA 300.1 (mod)

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

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)

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

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

PAH-511-WT Water PAH-O. Reg 153/04 (July 2011) SW846 3510/8270

Reference Information

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).

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

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

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

SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

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.

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

Chain of Custody Numbers:

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 weight of sample
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.

Quality Control Report

Workorder: L2093541 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Water**							
Batch R4050092								
WG2774969-2 LCS								
1,2,4-Trichlorobenzene			60.1		%		50-140	22-MAY-18
2-Chlorophenol			77.3		%		50-140	22-MAY-18
2,4-Dichlorophenol			87.6		%		50-140	22-MAY-18
2,4-Dimethylphenol			84.6		%		30-130	22-MAY-18
2,4-Dinitrophenol			109.2		%		50-140	22-MAY-18
2,4-Dinitrotoluene			99.4		%		50-140	22-MAY-18
2,4,5-Trichlorophenol			97.4		%		50-140	22-MAY-18
2,4,6-Trichlorophenol			92.0		%		50-140	22-MAY-18
2,6-Dinitrotoluene			93.3		%		50-140	22-MAY-18
3,3'-Dichlorobenzidine			77.3		%		30-130	22-MAY-18
4-Chloroaniline			64.9		%		30-130	22-MAY-18
Biphenyl			78.8		%		50-140	22-MAY-18
Bis(2-chloroethyl)ether			81.5		%		50-140	22-MAY-18
Bis(2-chloroisopropyl)ether			82.6		%		50-140	22-MAY-18
Bis(2-ethylhexyl)phthalate			116.8		%		50-140	22-MAY-18
Diethylphthalate			96.1		%		50-140	22-MAY-18
Dimethylphthalate			92.8		%		50-140	22-MAY-18
Pentachlorophenol			104.0		%		50-140	22-MAY-18
Phenol			46.0		%		30-130	22-MAY-18
WG2774969-3 LCSD		**WG2774969-2**						
1,2,4-Trichlorobenzene		60.1	62.4		%	3.7	50	22-MAY-18
2-Chlorophenol		77.3	83.1		%	7.2	50	22-MAY-18
2,4-Dichlorophenol		87.6	92.5		%	5.4	50	22-MAY-18
2,4-Dimethylphenol		84.6	92.2		%	8.7	50	22-MAY-18
2,4-Dinitrophenol		109.2	115.2		%	5.3	50	22-MAY-18
2,4-Dinitrotoluene		99.4	104.4		%	4.9	50	22-MAY-18
2,4,5-Trichlorophenol		97.4	101.4		%	4.1	50	22-MAY-18
2,4,6-Trichlorophenol		92.0	97.7		%	6.0	50	22-MAY-18
2,6-Dinitrotoluene		93.3	100.2		%	7.1	50	22-MAY-18
3,3'-Dichlorobenzidine		77.3	78.8		%	2.0	50	22-MAY-18
4-Chloroaniline		64.9	59.7		%	8.3	50	22-MAY-18
Biphenyl		78.8	81.8		%	3.7	50	22-MAY-18
Bis(2-chloroethyl)ether		81.5	85.0		%	4.2	50	22-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Water**							
Batch R4050092								
WG2774969-3 LCSD		**WG2774969-2**						
Bis(2-chloroisopropyl)ether		82.6	84.7		%	2.6	50	22-MAY-18
Bis(2-ethylhexyl)phthalate		116.8	123.9		%	5.9	50	22-MAY-18
Diethylphthalate		96.1	99.99		%	4.0	50	22-MAY-18
Dimethylphthalate		92.8	98.2		%	5.6	50	22-MAY-18
Pentachlorophenol		104.0	107.0		%	2.8	50	22-MAY-18
Phenol		46.0	50.6		%	9.5	50	22-MAY-18
WG2774969-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	22-MAY-18
2-Chlorophenol			<0.30		ug/L		0.3	22-MAY-18
2,4-Dichlorophenol			<0.30		ug/L		0.3	22-MAY-18
2,4-Dimethylphenol			<0.50		ug/L		0.5	22-MAY-18
2,4-Dinitrophenol			<1.0		ug/L		1	22-MAY-18
2,4-Dinitrotoluene			<0.40		ug/L		0.4	22-MAY-18
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	22-MAY-18
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	22-MAY-18
2,6-Dinitrotoluene			<0.40		ug/L		0.4	22-MAY-18
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	22-MAY-18
4-Chloroaniline			<0.40		ug/L		0.4	22-MAY-18
Biphenyl			<0.40		ug/L		0.4	22-MAY-18
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	22-MAY-18
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	22-MAY-18
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	22-MAY-18
Diethylphthalate			<0.20		ug/L		0.2	22-MAY-18
Dimethylphthalate			<0.20		ug/L		0.2	22-MAY-18
Pentachlorophenol			<0.50		ug/L		0.5	22-MAY-18
Phenol			<0.50		ug/L		0.5	22-MAY-18
Surrogate: 2-Fluorobiphenyl			87.5		%		50-140	22-MAY-18
Surrogate: 2,4,6-Tribromophenol			75.0		%		50-140	22-MAY-18
Surrogate: Nitrobenzene d5			88.8		%		50-140	22-MAY-18
Surrogate: p-Terphenyl d14			115.5		%		60-140	22-MAY-18
Surrogate: Phenol d5			45.9		%		30-130	22-MAY-18
ALK-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT	**Water**							
Batch R4046936								
WG2775016-3 CRM		**WT-ALK-CRM**						
Alkalinity, Total (as CaCO3)			93.4		%		80-120	17-MAY-18
WG2775016-4 DUP		**L2093887-1**						
Alkalinity, Total (as CaCO3)		260	266		mg/L	2.2	20	17-MAY-18
WG2775016-2 LCS								
Alkalinity, Total (as CaCO3)			98.6		%		85-115	17-MAY-18
WG2775016-1 MB								
Alkalinity, Total (as CaCO3)			<10		mg/L		10	17-MAY-18
C-DIS-ORG-WT	**Water**							
Batch R4046482								
WG2773357-3 DUP		**L2093543-4**						
Dissolved Organic Carbon		1.8	2.8	J	mg/L	1.0	2	16-MAY-18
WG2773357-2 LCS								
Dissolved Organic Carbon			98.0		%		80-120	16-MAY-18
WG2773357-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	16-MAY-18
WG2773357-4 MS		**L2093543-4**						
Dissolved Organic Carbon			90.7		%		70-130	16-MAY-18
CL-IC-N-WT	**Water**							
Batch R4046897								
WG2773735-4 DUP		**WG2773735-3**						
Chloride (Cl)		15.3	15.3		mg/L	0.1	20	16-MAY-18
WG2773735-2 LCS								
Chloride (Cl)			101.7		%		90-110	16-MAY-18
WG2773735-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	16-MAY-18
WG2773735-5 MS		**WG2773735-3**						
Chloride (Cl)			103.9		%		75-125	16-MAY-18
CN-WAD-R511-WT	**Water**							
Batch R4050720								
WG2776030-3 DUP		**L2093541-1**						
Cyanide, Weak Acid Diss		<2.0	<2.0	RPD-NA	ug/L	N/A	20	18-MAY-18
WG2776030-2 LCS								
Cyanide, Weak Acid Diss			91.7		%		80-120	18-MAY-18
WG2776030-1 MB								
Cyanide, Weak Acid Diss			<2.0		ug/L		2	18-MAY-18
WG2776030-4 MS		**L2093541-1**						

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT	**Water**							
Batch R4050720								
WG2776030-4 MS		**L2093541-1**						
Cyanide, Weak Acid Diss			80.8		%		75-125	18-MAY-18
CR-CR6-IC-R511-WT	**Water**							
Batch R4043214								
WG2770335-19 DUP		**WG2770335-18**						
Chromium, Hexavalent		<1.0	<1.0	RPD-NA	ug/L	N/A	20	14-MAY-18
WG2770335-24 DUP		**WG2770335-23**						
Chromium, Hexavalent		<1.0	<1.0	RPD-NA	ug/L	N/A	20	14-MAY-18
WG2770335-17 LCS								
Chromium, Hexavalent			100.9		%		80-120	14-MAY-18
WG2770335-22 LCS								
Chromium, Hexavalent			107.6		%		80-120	14-MAY-18
WG2770335-16 MB								
Chromium, Hexavalent			<1.0		ug/L		1	14-MAY-18
WG2770335-21 MB								
Chromium, Hexavalent			<1.0		ug/L		1	14-MAY-18
WG2770335-20 MS		**WG2770335-18**						
Chromium, Hexavalent			100.9		%		70-130	14-MAY-18
WG2770335-25 MS		**WG2770335-23**						
Chromium, Hexavalent			99.9		%		70-130	14-MAY-18
EC-R511-WT	**Water**							
Batch R4044635								
WG2772432-12 DUP		**WG2772432-11**						
Conductivity		3.70	3.67		mS/cm	0.8	10	15-MAY-18
WG2772432-4 DUP		**WG2772432-3**						
Conductivity		0.735	0.734		mS/cm	0.1	10	15-MAY-18
WG2772432-8 DUP		**WG2772432-7**						
Conductivity		1.57	1.56		mS/cm	0.4	10	15-MAY-18
WG2772432-10 LCS								
Conductivity			97.5		%		90-110	15-MAY-18
WG2772432-2 LCS								
Conductivity			99.5		%		90-110	15-MAY-18
WG2772432-6 LCS								
Conductivity			98.9		%		90-110	15-MAY-18
WG2772432-1 MB								
Conductivity			<0.0030		mS/cm		0.003	15-MAY-18
WG2772432-5 MB								

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-R511-WT	**Water**							
Batch R4044635								
WG2772432-5 MB								
Conductivity			<0.0030		mS/cm		0.003	15-MAY-18
WG2772432-9 MB								
Conductivity			<0.0030		mS/cm		0.003	15-MAY-18
F1-HS-511-WT	**Water**							
Batch R4046328								
WG2770660-4 DUP		**WG2770660-3**						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	17-MAY-18
WG2770660-1 LCS								
F1 (C6-C10)			95.0		%		80-120	16-MAY-18
WG2770660-2 MB								
F1 (C6-C10)			<25		ug/L		25	17-MAY-18
Surrogate: 3,4-Dichlorotoluene			95.4		%		60-140	17-MAY-18
WG2770660-5 MS		**WG2770660-3**						
F1 (C6-C10)			89.4		%		60-140	17-MAY-18
F2-F4-511-WT	**Water**							
Batch R4047463								
WG2774417-2 LCS								
F2 (C10-C16)			106.8		%		70-130	17-MAY-18
F3 (C16-C34)			113.2		%		70-130	17-MAY-18
F4 (C34-C50)			109.6		%		70-130	17-MAY-18
WG2774417-1 MB								
F2 (C10-C16)			<100		ug/L		100	17-MAY-18
F3 (C16-C34)			<250		ug/L		250	17-MAY-18
F4 (C34-C50)			<250		ug/L		250	17-MAY-18
Surrogate: 2-Bromobenzotrifluoride			95.9		%		60-140	17-MAY-18
HG-D-UG/L-CVAA-WT	**Water**							
Batch R4044019								
WG2772487-3 DUP		**L2093541-1**						
Mercury (Hg)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	15-MAY-18
WG2772487-2 LCS								
Mercury (Hg)-Dissolved			96.1		%		80-120	15-MAY-18
WG2772487-1 MB								
Mercury (Hg)-Dissolved			<0.010		ug/L		0.01	15-MAY-18
WG2772487-4 MS		**L2093541-2**						
Mercury (Hg)-Dissolved			86.4		%		70-130	15-MAY-18
MET-D-UG/L-MS-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4044327								
WG2772238-4 DUP		**WG2772238-3**						
Antimony (Sb)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Arsenic (As)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Barium (Ba)-Dissolved		118	115		ug/L	2.0	20	15-MAY-18
Beryllium (Be)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Boron (B)-Dissolved		380	320		ug/L	15	20	15-MAY-18
Cadmium (Cd)-Dissolved		0.153	0.154		ug/L	1.2	20	15-MAY-18
Calcium (Ca)-Dissolved		268000	247000		ug/L	8.5	20	15-MAY-18
Chromium (Cr)-Dissolved		<5.0	<5.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Cobalt (Co)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Copper (Cu)-Dissolved		5.7	5.4		ug/L	4.2	20	15-MAY-18
Iron (Fe)-Dissolved		260	270		ug/L	1.3	20	15-MAY-18
Lead (Pb)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	15-MAY-18
Magnesium (Mg)-Dissolved		36500	36300		ug/L	0.7	20	15-MAY-18
Manganese (Mn)-Dissolved		184	185		ug/L	0.5	20	15-MAY-18
Molybdenum (Mo)-Dissolved		0.96	0.92		ug/L	4.3	20	15-MAY-18
Nickel (Ni)-Dissolved		<5.0	5.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Selenium (Se)-Dissolved		1.98	1.63		ug/L	19	20	15-MAY-18
Silver (Ag)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	15-MAY-18
Sodium (Na)-Dissolved		421000	420000		ug/L	0.2	20	15-MAY-18
Thallium (Tl)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	15-MAY-18
Uranium (U)-Dissolved		3.08	3.05		ug/L	1.0	20	15-MAY-18
Vanadium (V)-Dissolved		<5.0	<5.0	RPD-NA	ug/L	N/A	20	15-MAY-18
Zinc (Zn)-Dissolved		95	94		ug/L	1.2	20	15-MAY-18
WG2772238-2 LCS								
Antimony (Sb)-Dissolved			102.2		%		80-120	15-MAY-18
Arsenic (As)-Dissolved			99.1		%		80-120	15-MAY-18
Barium (Ba)-Dissolved			102.5		%		80-120	15-MAY-18
Beryllium (Be)-Dissolved			98.0		%		80-120	15-MAY-18
Boron (B)-Dissolved			97.3		%		80-120	15-MAY-18
Cadmium (Cd)-Dissolved			99.1		%		80-120	15-MAY-18
Calcium (Ca)-Dissolved			99.99		%		80-120	15-MAY-18
Chromium (Cr)-Dissolved			97.0		%		80-120	15-MAY-18
Cobalt (Co)-Dissolved			97.0		%		80-120	15-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4044327								
WG2772238-2 LCS								
Copper (Cu)-Dissolved			98.7		%		80-120	15-MAY-18
Iron (Fe)-Dissolved			96.0		%		80-120	15-MAY-18
Lead (Pb)-Dissolved			101.6		%		80-120	15-MAY-18
Magnesium (Mg)-Dissolved			103.9		%		80-120	15-MAY-18
Manganese (Mn)-Dissolved			97.8		%		80-120	15-MAY-18
Molybdenum (Mo)-Dissolved			98.8		%		80-120	15-MAY-18
Nickel (Ni)-Dissolved			98.9		%		80-120	15-MAY-18
Selenium (Se)-Dissolved			97.5		%		80-120	15-MAY-18
Silver (Ag)-Dissolved			98.5		%		80-120	15-MAY-18
Sodium (Na)-Dissolved			99.3		%		80-120	15-MAY-18
Thallium (Tl)-Dissolved			100.1		%		80-120	15-MAY-18
Uranium (U)-Dissolved			100.6		%		80-120	15-MAY-18
Vanadium (V)-Dissolved			100.2		%		80-120	15-MAY-18
Zinc (Zn)-Dissolved			96.7		%		80-120	15-MAY-18
WG2772238-1 MB								
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	15-MAY-18
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	15-MAY-18
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	15-MAY-18
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	15-MAY-18
Boron (B)-Dissolved			<10		ug/L		10	15-MAY-18
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	15-MAY-18
Calcium (Ca)-Dissolved			<50		ug/L		50	15-MAY-18
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	15-MAY-18
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	15-MAY-18
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	15-MAY-18
Iron (Fe)-Dissolved			<10		ug/L		10	15-MAY-18
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	15-MAY-18
Magnesium (Mg)-Dissolved			<5.0		ug/L		5	15-MAY-18
Manganese (Mn)-Dissolved			<0.50		ug/L		0.5	15-MAY-18
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	15-MAY-18
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	15-MAY-18
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	15-MAY-18
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	15-MAY-18
Sodium (Na)-Dissolved			<50		ug/L		50	15-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4044327								
WG2772238-1 MB								
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	15-MAY-18
Uranium (U)-Dissolved			<0.010		ug/L		0.01	15-MAY-18
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	15-MAY-18
Zinc (Zn)-Dissolved			<1.0		ug/L		1	15-MAY-18
WG2772238-5 MS		**WG2772238-6**						
Antimony (Sb)-Dissolved			97.0		%		70-130	15-MAY-18
Arsenic (As)-Dissolved			105.3		%		70-130	15-MAY-18
Barium (Ba)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Beryllium (Be)-Dissolved			97.2		%		70-130	15-MAY-18
Boron (B)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Cadmium (Cd)-Dissolved			94.5		%		70-130	15-MAY-18
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Chromium (Cr)-Dissolved			98.6		%		70-130	15-MAY-18
Cobalt (Co)-Dissolved			91.8		%		70-130	15-MAY-18
Copper (Cu)-Dissolved			87.6		%		70-130	15-MAY-18
Iron (Fe)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Lead (Pb)-Dissolved			89.8		%		70-130	15-MAY-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Molybdenum (Mo)-Dissolved			97.2		%		70-130	15-MAY-18
Nickel (Ni)-Dissolved			89.0		%		70-130	15-MAY-18
Selenium (Se)-Dissolved			108.4		%		70-130	15-MAY-18
Silver (Ag)-Dissolved			92.2		%		70-130	15-MAY-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Thallium (Tl)-Dissolved			89.9		%		70-130	15-MAY-18
Uranium (U)-Dissolved			N/A	MS-B	%		-	15-MAY-18
Vanadium (V)-Dissolved			104.7		%		70-130	15-MAY-18
Zinc (Zn)-Dissolved			N/A	MS-B	%		-	15-MAY-18
NH3-WT	**Water**							
Batch R4046688								
WG2773553-3 DUP		**L2093271-1**						
Ammonia, Total (as N)		0.251	0.254		mg/L	1.1	20	16-MAY-18
WG2773553-7 DUP		**L2093541-12**						
Ammonia, Total (as N)		30.3	29.7		mg/L	2.0	20	16-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-WT	**Water**							
Batch R4046688								
WG2773553-2 LCS								
Ammonia, Total (as N)			94.6		%		85-115	16-MAY-18
WG2773553-6 LCS								
Ammonia, Total (as N)			101.8		%		85-115	16-MAY-18
WG2773553-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	16-MAY-18
WG2773553-5 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	16-MAY-18
WG2773553-4 MS		**L2093271-1**						
Ammonia, Total (as N)			99.6		%		75-125	16-MAY-18
WG2773553-8 MS		**L2093541-12**						
Ammonia, Total (as N)			N/A	MS-B	%		-	16-MAY-18
NO2-IC-WT	**Water**							
Batch R4046897								
WG2773735-4 DUP		**WG2773735-3**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	25	16-MAY-18
WG2773735-2 LCS								
Nitrite (as N)			101.4		%		70-130	16-MAY-18
WG2773735-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	16-MAY-18
WG2773735-5 MS		**WG2773735-3**						
Nitrite (as N)			103.3		%		70-130	16-MAY-18
NO3-IC-WT	**Water**							
Batch R4046897								
WG2773735-4 DUP		**WG2773735-3**						
Nitrate (as N)		0.386	0.388		mg/L	0.6	25	16-MAY-18
WG2773735-2 LCS								
Nitrate (as N)			101.3		%		70-130	16-MAY-18
WG2773735-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	16-MAY-18
WG2773735-5 MS		**WG2773735-3**						
Nitrate (as N)			103.4		%		70-130	16-MAY-18
P-T-COL-WT	**Water**							
Batch R4045211								
WG2772913-3 DUP		**L2093541-4**						
Phosphorus, Total		0.0265	0.0284		mg/L	7.0	20	16-MAY-18
WG2772913-2 LCS								

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WT	**Water**							
Batch R4045211								
WG2772913-2 LCS								
Phosphorus, Total			92.7		%		80-120	16-MAY-18
WG2772913-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	16-MAY-18
WG2772913-4 MS		**L2093541-4**						
Phosphorus, Total			98.4		%		70-130	16-MAY-18
PAH-511-WT	**Water**							
Batch R4047455								
WG2774417-2 LCS								
1-Methylnaphthalene			97.3		%		50-140	18-MAY-18
2-Methylnaphthalene			91.6		%		50-140	18-MAY-18
Acenaphthene			100.4		%		50-140	18-MAY-18
Acenaphthylene			103.3		%		50-140	18-MAY-18
Anthracene			106.6		%		50-140	18-MAY-18
Benzo(a)anthracene			114.2		%		50-140	18-MAY-18
Benzo(a)pyrene			104.3		%		50-140	18-MAY-18
Benzo(b)fluoranthene			99.8		%		50-140	18-MAY-18
Benzo(g,h,i)perylene			107.4		%		50-140	18-MAY-18
Benzo(k)fluoranthene			104.7		%		50-140	18-MAY-18
Chrysene			118.5		%		50-140	18-MAY-18
Dibenzo(ah)anthracene			106.2		%		50-140	18-MAY-18
Fluoranthene			110.8		%		50-140	18-MAY-18
Fluorene			106.0		%		50-140	18-MAY-18
Indeno(1,2,3-cd)pyrene			117.4		%		50-140	18-MAY-18
Naphthalene			100.1		%		50-140	18-MAY-18
Phenanthrene			109.5		%		50-140	18-MAY-18
Pyrene			110.3		%		50-140	18-MAY-18
WG2774417-3 LCSD		**WG2774417-2**						
1-Methylnaphthalene		97.3	93.0		%	4.5	50	18-MAY-18
2-Methylnaphthalene		91.6	87.2		%	4.9	50	18-MAY-18
Acenaphthene		100.4	95.1		%	5.4	50	18-MAY-18
Acenaphthylene		103.3	97.4		%	5.9	50	18-MAY-18
Anthracene		106.6	99.4		%	7.0	50	18-MAY-18
Benzo(a)anthracene		114.2	109.2		%	4.5	50	18-MAY-18
Benzo(a)pyrene		104.3	99.3		%	5.0	50	18-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R4047455								
WG2774417-3 LCSD		**WG2774417-2**						
Benzo(b)fluoranthene		99.8	95.8		%	4.1	50	18-MAY-18
Benzo(g,h,i)perylene		107.4	102.9		%	4.3	50	18-MAY-18
Benzo(k)fluoranthene		104.7	101.0		%	3.7	50	18-MAY-18
Chrysene		118.5	112.6		%	5.1	50	18-MAY-18
Dibenzo(ah)anthracene		106.2	101.3		%	4.7	50	18-MAY-18
Fluoranthene		110.8	104.6		%	5.8	50	18-MAY-18
Fluorene		106.0	100.6		%	5.2	50	18-MAY-18
Indeno(1,2,3-cd)pyrene		117.4	111.3		%	5.3	50	18-MAY-18
Naphthalene		100.1	95.2		%	5.0	50	18-MAY-18
Phenanthrene		109.5	102.7		%	6.4	50	18-MAY-18
Pyrene		110.3	104.2		%	5.7	50	18-MAY-18
WG2774417-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	18-MAY-18
2-Methylnaphthalene			<0.020		ug/L		0.02	18-MAY-18
Acenaphthene			<0.020		ug/L		0.02	18-MAY-18
Acenaphthylene			<0.020		ug/L		0.02	18-MAY-18
Anthracene			<0.020		ug/L		0.02	18-MAY-18
Benzo(a)anthracene			<0.020		ug/L		0.02	18-MAY-18
Benzo(a)pyrene			<0.010		ug/L		0.01	18-MAY-18
Benzo(b)fluoranthene			<0.020		ug/L		0.02	18-MAY-18
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	18-MAY-18
Benzo(k)fluoranthene			<0.020		ug/L		0.02	18-MAY-18
Chrysene			<0.020		ug/L		0.02	18-MAY-18
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	18-MAY-18
Fluoranthene			<0.020		ug/L		0.02	18-MAY-18
Fluorene			<0.020		ug/L		0.02	18-MAY-18
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	18-MAY-18
Naphthalene			<0.050		ug/L		0.05	18-MAY-18
Phenanthrene			<0.020		ug/L		0.02	18-MAY-18
Pyrene			<0.020		ug/L		0.02	18-MAY-18
Surrogate: d8-Naphthalene			118.5		%		60-140	18-MAY-18
Surrogate: d10-Phenanthrene			114.5		%		60-140	18-MAY-18
Surrogate: d12-Chrysene			109.2		%		60-140	18-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R4047455								
WG2774417-1 MB								
Surrogate: d10-Acenaphthene			110.5		%		60-140	18-MAY-18
PH-WT	**Water**							
Batch R4044635								
WG2772432-12 DUP		**WG2772432-11**						
pH		6.73	6.79	J	pH units	0.06	0.2	15-MAY-18
WG2772432-4 DUP		**WG2772432-3**						
pH		9.09	9.09	J	pH units	0.00	0.2	15-MAY-18
WG2772432-8 DUP		**WG2772432-7**						
pH		7.41	7.41	J	pH units	0.01	0.2	15-MAY-18
WG2772432-10 LCS								
pH			6.98		pH units		6.9-7.1	15-MAY-18
WG2772432-2 LCS								
pH			6.98		pH units		6.9-7.1	15-MAY-18
WG2772432-6 LCS								
pH			6.99		pH units		6.9-7.1	15-MAY-18
PHENOLS-4AAP-WT	**Water**							
Batch R4043900								
WG2771723-19 DUP		**L2093271-2**						
Phenols (4AAP)		0.0022	0.0019		mg/L	10	20	14-MAY-18
WG2771723-23 DUP		**L2093541-12**						
Phenols (4AAP)		0.0067	0.0057		mg/L	17	20	14-MAY-18
WG2771723-18 LCS								
Phenols (4AAP)			104.6		%		85-115	14-MAY-18
WG2771723-22 LCS								
Phenols (4AAP)			106.9		%		85-115	14-MAY-18
WG2771723-17 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	14-MAY-18
WG2771723-21 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	14-MAY-18
WG2771723-20 MS		**L2093271-2**						
Phenols (4AAP)			93.9		%		75-125	14-MAY-18
WG2771723-24 MS		**L2093541-12**						
Phenols (4AAP)			102.3		%		75-125	14-MAY-18
SO4-IC-N-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WT	**Water**							
Batch R4046897								
WG2773735-4 DUP		**WG2773735-3**						
Sulfate (SO4)		13.8	13.8		mg/L	0.2	20	16-MAY-18
WG2773735-2 LCS								
Sulfate (SO4)			102.8		%		90-110	16-MAY-18
WG2773735-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	16-MAY-18
WG2773735-5 MS		**WG2773735-3**						
Sulfate (SO4)			105.3		%		75-125	16-MAY-18
SOLIDS-TDS-WT	**Water**							
Batch R4046600								
WG2773339-3 DUP		**L2092995-3**						
Total Dissolved Solids		406	398		mg/L	2.1	20	16-MAY-18
WG2773339-2 LCS								
Total Dissolved Solids			101.6		%		85-115	16-MAY-18
WG2773339-1 MB								
Total Dissolved Solids			<10		mg/L		10	17-MAY-18
TKN-WT	**Water**							
Batch R4046628								
WG2773886-3 DUP		**L2093233-3**						
Total Kjeldahl Nitrogen		0.35	0.23	J	mg/L	0.12	0.3	17-MAY-18
WG2773886-2 LCS								
Total Kjeldahl Nitrogen			109.6		%		75-125	17-MAY-18
WG2773886-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	17-MAY-18
WG2773886-4 MS		**L2093233-3**						
Total Kjeldahl Nitrogen			102.7		%		70-130	17-MAY-18
Batch R4047847								
WG2774439-3 DUP		**L2093541-5**						
Total Kjeldahl Nitrogen		3.40	3.44		mg/L	1.2	20	18-MAY-18
WG2774439-2 LCS								
Total Kjeldahl Nitrogen			111.1		%		75-125	18-MAY-18
WG2774439-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	18-MAY-18
WG2774439-4 MS		**L2093541-5**						
Total Kjeldahl Nitrogen			108.6		%		70-130	18-MAY-18
VOC-511-HS-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4046328								
WG2770660-4 DUP		**WG2770660-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	17-MAY-18
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	17-MAY-18
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-MAY-18
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	17-MAY-18
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	17-MAY-18
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	17-MAY-18
cis-1,2-Dichloroethylene		0.58	0.54		ug/L	7.1	30	17-MAY-18
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	17-MAY-18
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-MAY-18
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-MAY-18
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	17-MAY-18
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	17-MAY-18
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	17-MAY-18
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	17-MAY-18
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-MAY-18
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	17-MAY-18
Styrene		<0.50	<0.50		ug/L			17-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4046328								
WG2770660-4 DUP		**WG2770660-3**						
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	17-MAY-18
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	17-MAY-18
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-MAY-18
WG2770660-1 LCS								
1,1,1,2-Tetrachloroethane			95.3		%		70-130	16-MAY-18
1,1,2,2-Tetrachloroethane			97.9		%		70-130	16-MAY-18
1,1,1-Trichloroethane			97.4		%		70-130	16-MAY-18
1,1,2-Trichloroethane			104.8		%		70-130	16-MAY-18
1,1-Dichloroethane			104.3		%		70-130	16-MAY-18
1,1-Dichloroethylene			94.0		%		70-130	16-MAY-18
1,2-Dibromoethane			103.2		%		70-130	16-MAY-18
1,2-Dichlorobenzene			96.4		%		70-130	16-MAY-18
1,2-Dichloroethane			105.4		%		70-130	16-MAY-18
1,2-Dichloropropane			101.9		%		70-130	16-MAY-18
1,3-Dichlorobenzene			94.5		%		70-130	16-MAY-18
1,4-Dichlorobenzene			95.9		%		70-130	16-MAY-18
Acetone			120.2		%		60-140	16-MAY-18
Benzene			102.6		%		70-130	16-MAY-18
Bromodichloromethane			94.9		%		70-130	16-MAY-18
Bromoform			104.3		%		70-130	16-MAY-18
Bromomethane			102.9		%		60-140	16-MAY-18
Carbon tetrachloride			94.8		%		70-130	16-MAY-18
Chlorobenzene			97.8		%		70-130	16-MAY-18
Chloroform			101.1		%		70-130	16-MAY-18
cis-1,2-Dichloroethylene			101.0		%		70-130	16-MAY-18
cis-1,3-Dichloropropene			97.4		%		70-130	16-MAY-18
Dibromochloromethane			99.2		%		70-130	16-MAY-18
Dichlorodifluoromethane			106.0		%		50-140	16-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4046328								
WG2770660-1 LCS								
Ethylbenzene			95.1		%		70-130	16-MAY-18
n-Hexane			111.2		%		70-130	16-MAY-18
m+p-Xylenes			95.6		%		70-130	16-MAY-18
Methyl Ethyl Ketone			115.3		%		60-140	16-MAY-18
Methyl Isobutyl Ketone			98.6		%		60-140	16-MAY-18
Methylene Chloride			109.9		%		70-130	16-MAY-18
MTBE			100.5		%		70-130	16-MAY-18
o-Xylene			94.6		%		70-130	16-MAY-18
Styrene			92.8		%		70-130	16-MAY-18
Tetrachloroethylene			95.8		%		70-130	16-MAY-18
Toluene			98.4		%		70-130	16-MAY-18
trans-1,2-Dichloroethylene			101.6		%		70-130	16-MAY-18
trans-1,3-Dichloropropene			100.3		%		70-130	16-MAY-18
Trichloroethylene			99.97		%		70-130	16-MAY-18
Trichlorofluoromethane			99.8		%		60-140	16-MAY-18
Vinyl chloride			96.6		%		60-140	16-MAY-18
WG2770660-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	17-MAY-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	17-MAY-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	17-MAY-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	17-MAY-18
1,1-Dichloroethane			<0.50		ug/L		0.5	17-MAY-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	17-MAY-18
1,2-Dibromoethane			<0.20		ug/L		0.2	17-MAY-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	17-MAY-18
1,2-Dichloroethane			<0.50		ug/L		0.5	17-MAY-18
1,2-Dichloropropane			<0.50		ug/L		0.5	17-MAY-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	17-MAY-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	17-MAY-18
Acetone			<30		ug/L		30	17-MAY-18
Benzene			<0.50		ug/L		0.5	17-MAY-18
Bromodichloromethane			<2.0		ug/L		2	17-MAY-18
Bromoform			<5.0		ug/L		5	17-MAY-18
Bromomethane			<0.50		ug/L		0.5	17-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4046328								
WG2770660-2 MB								
Carbon tetrachloride			<0.20		ug/L		0.2	17-MAY-18
Chlorobenzene			<0.50		ug/L		0.5	17-MAY-18
Chloroform			<1.0		ug/L		1	17-MAY-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	17-MAY-18
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	17-MAY-18
Dibromochloromethane			<2.0		ug/L		2	17-MAY-18
Dichlorodifluoromethane			<2.0		ug/L		2	17-MAY-18
Ethylbenzene			<0.50		ug/L		0.5	17-MAY-18
n-Hexane			<0.50		ug/L		0.5	17-MAY-18
m+p-Xylenes			<0.40		ug/L		0.4	17-MAY-18
Methyl Ethyl Ketone			<20		ug/L		20	17-MAY-18
Methyl Isobutyl Ketone			<20		ug/L		20	17-MAY-18
Methylene Chloride			<5.0		ug/L		5	17-MAY-18
MTBE			<2.0		ug/L		2	17-MAY-18
o-Xylene			<0.30		ug/L		0.3	17-MAY-18
Styrene			<0.50		ug/L		0.5	17-MAY-18
Tetrachloroethylene			<0.50		ug/L		0.5	17-MAY-18
Toluene			<0.50		ug/L		0.5	17-MAY-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	17-MAY-18
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	17-MAY-18
Trichloroethylene			<0.50		ug/L		0.5	17-MAY-18
Trichlorofluoromethane			<5.0		ug/L		5	17-MAY-18
Vinyl chloride			<0.50		ug/L		0.5	17-MAY-18
Surrogate: 1,4-Difluorobenzene			100.2		%		70-130	17-MAY-18
Surrogate: 4-Bromofluorobenzene			92.6		%		70-130	17-MAY-18
WG2770660-5 MS		**WG2770660-3**						
1,1,1,2-Tetrachloroethane			95.0		%		50-140	17-MAY-18
1,1,2,2-Tetrachloroethane			99.9		%		50-140	17-MAY-18
1,1,1-Trichloroethane			96.4		%		50-140	17-MAY-18
1,1,2-Trichloroethane			105.6		%		50-140	17-MAY-18
1,1-Dichloroethane			93.6		%		50-140	17-MAY-18
1,1-Dichloroethylene			93.1		%		50-140	17-MAY-18
1,2-Dibromoethane			104.4		%		50-140	17-MAY-18
1,2-Dichlorobenzene			96.2		%		50-140	17-MAY-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4046328								
WG2770660-5 MS		**WG2770660-3**						
1,2-Dichloroethane			106.8		%		50-140	17-MAY-18
1,2-Dichloropropane			103.2		%		50-140	17-MAY-18
1,3-Dichlorobenzene			92.9		%		50-140	17-MAY-18
1,4-Dichlorobenzene			95.1		%		50-140	17-MAY-18
Acetone			121.4		%		50-140	17-MAY-18
Benzene			102.6		%		50-140	17-MAY-18
Bromodichloromethane			96.0		%		50-140	17-MAY-18
Bromoform			104.7		%		50-140	17-MAY-18
Bromomethane			101.6		%		50-140	17-MAY-18
Carbon tetrachloride			93.8		%		50-140	17-MAY-18
Chlorobenzene			97.4		%		50-140	17-MAY-18
Chloroform			101.5		%		50-140	17-MAY-18
cis-1,2-Dichloroethylene			100.6		%		50-140	17-MAY-18
cis-1,3-Dichloropropene			95.6		%		50-140	17-MAY-18
Dibromochloromethane			99.4		%		50-140	17-MAY-18
Dichlorodifluoromethane			117.7		%		50-140	17-MAY-18
Ethylbenzene			93.2		%		50-140	17-MAY-18
n-Hexane			109.4		%		50-140	17-MAY-18
m+p-Xylenes			93.7		%		50-140	17-MAY-18
Methyl Ethyl Ketone			115.6		%		50-140	17-MAY-18
Methyl Isobutyl Ketone			102.5		%		50-140	17-MAY-18
Methylene Chloride			110.5		%		50-140	17-MAY-18
MTBE			100.7		%		50-140	17-MAY-18
o-Xylene			93.1		%		50-140	17-MAY-18
Styrene			91.9		%		50-140	17-MAY-18
Tetrachloroethylene			93.7		%		50-140	17-MAY-18
Toluene			96.9		%		50-140	17-MAY-18
trans-1,2-Dichloroethylene			101.3		%		50-140	17-MAY-18
trans-1,3-Dichloropropene			96.3		%		50-140	17-MAY-18
Trichloroethylene			99.5		%		50-140	17-MAY-18
Trichlorofluoromethane			99.4		%		50-140	17-MAY-18
Vinyl chloride			98.9		%		50-140	17-MAY-18

Quality Control Report

Workorder: L2093541 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

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.
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.

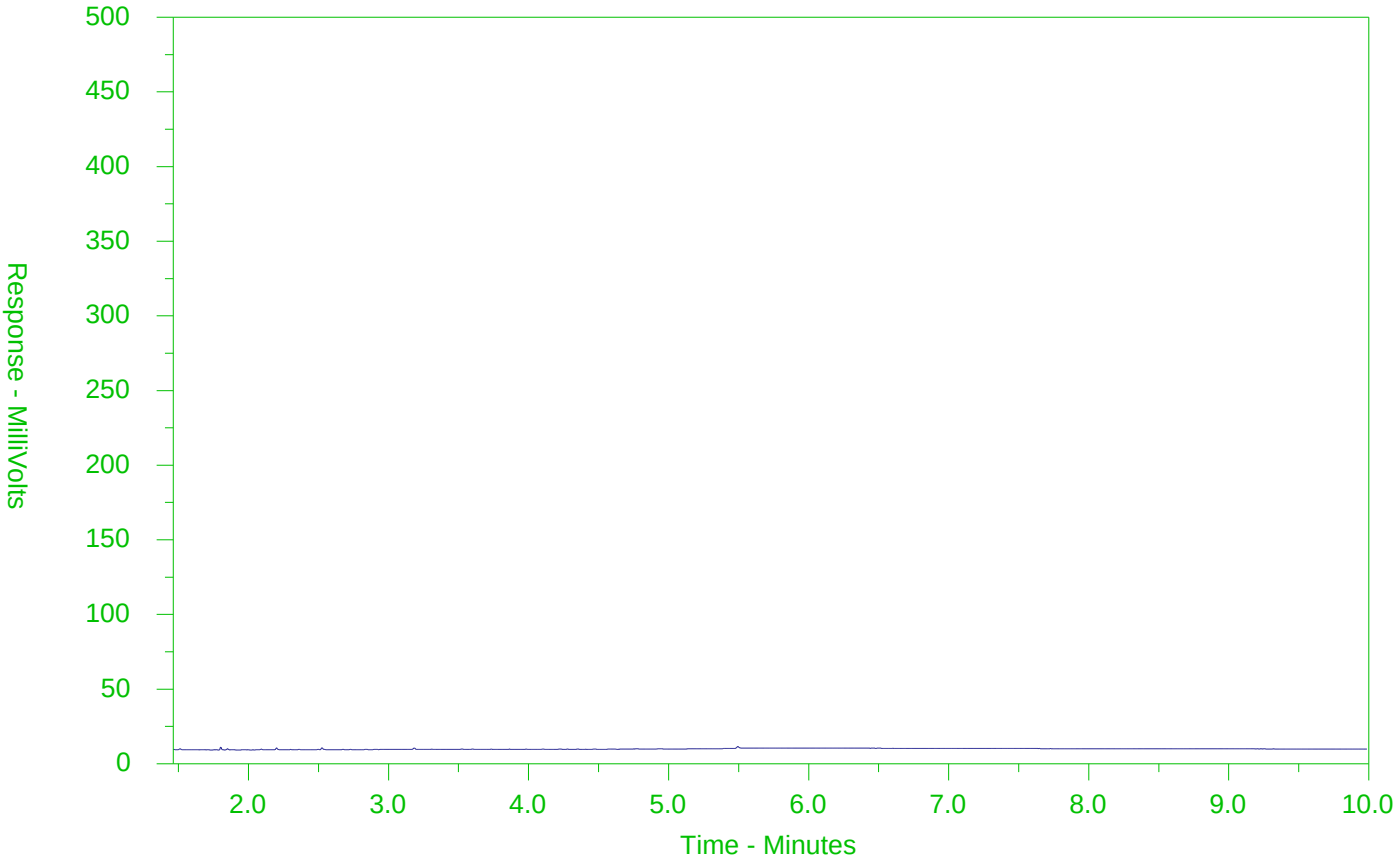
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where 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: L2093541-1
Client Sample ID: GW-11149990-051118-TW-001



←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.

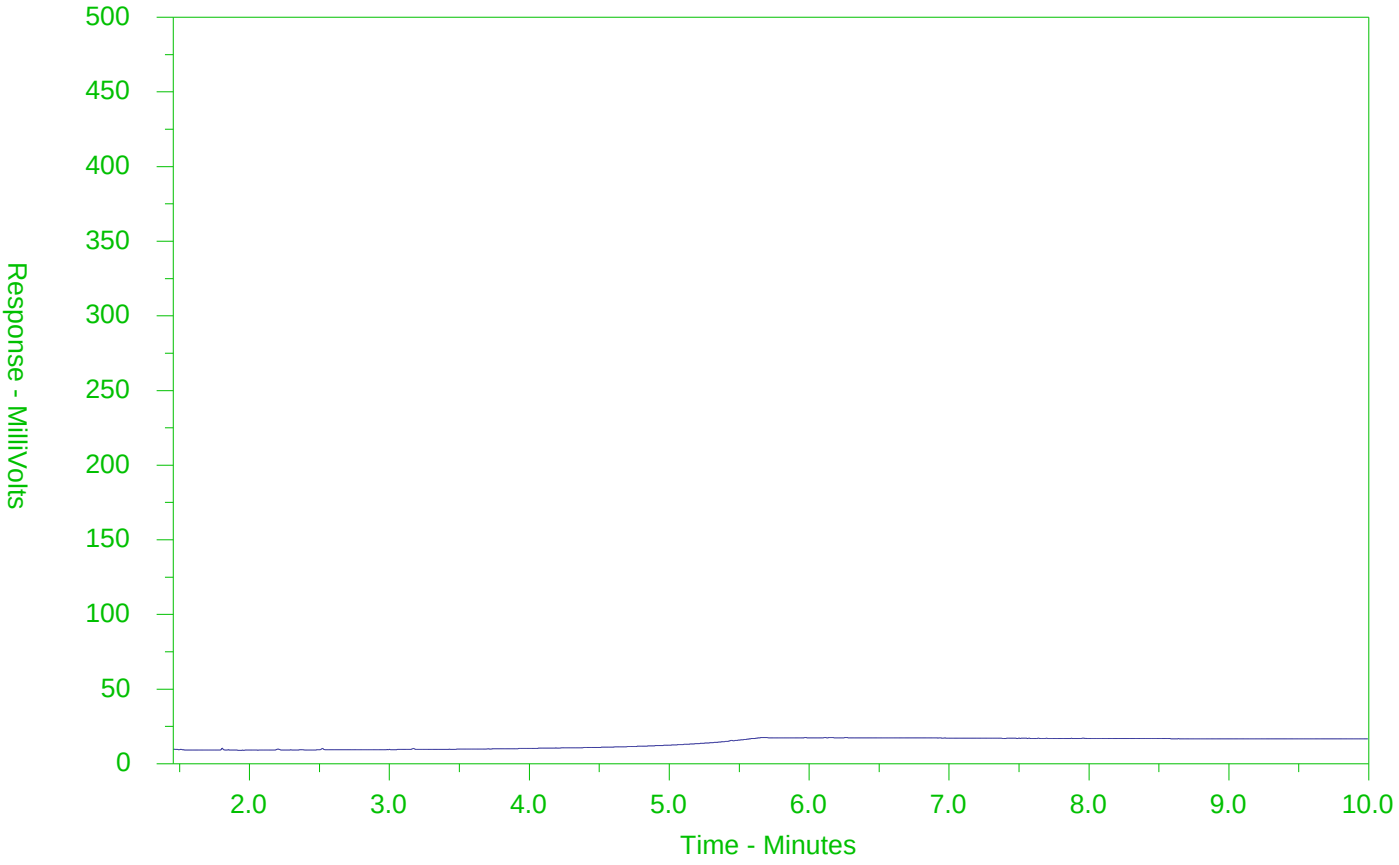
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-2
Client Sample ID: GW-11149990-051118-TW-003



←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.

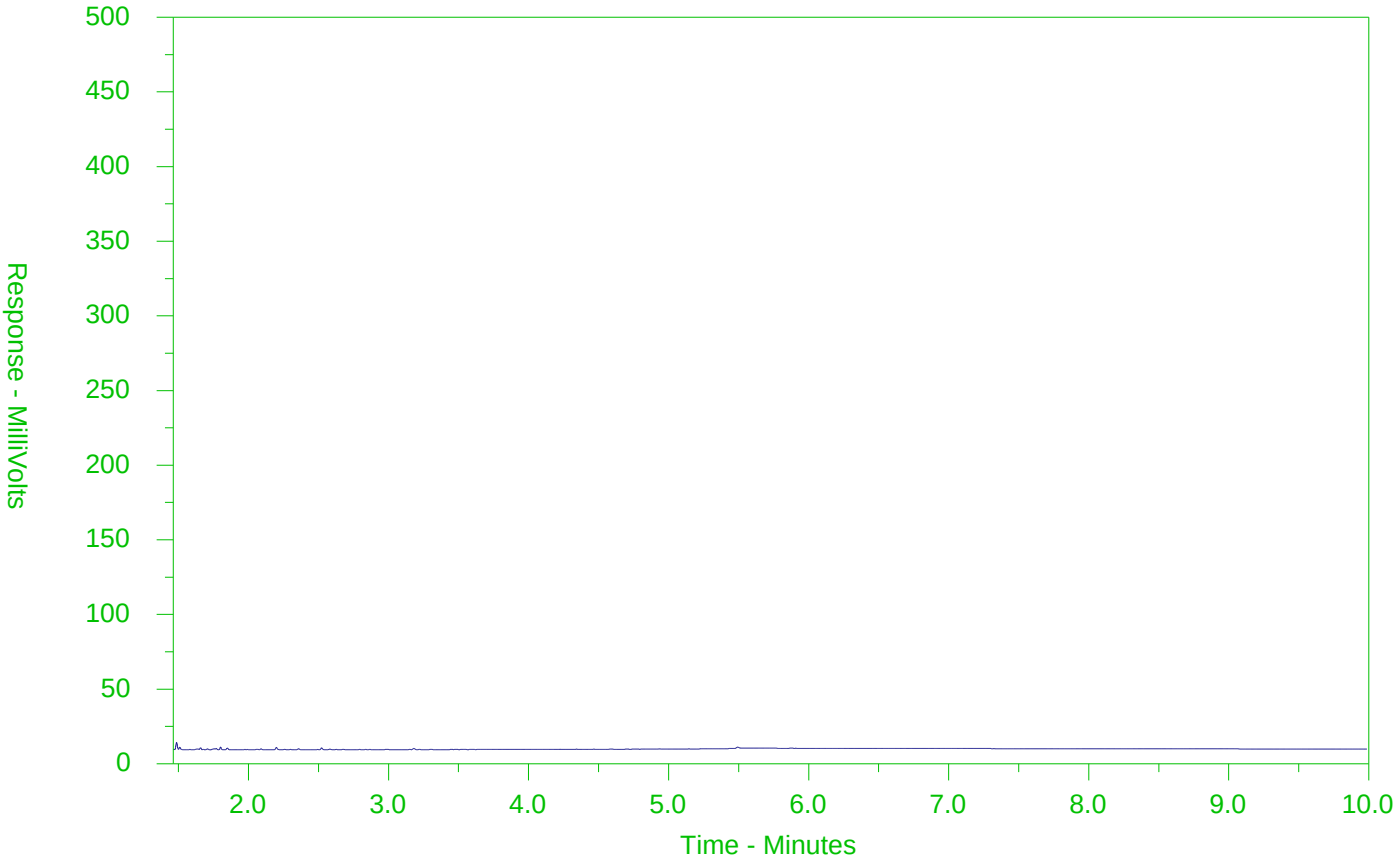
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-3
Client Sample ID: GW-11149990-051118-TW-004



←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.

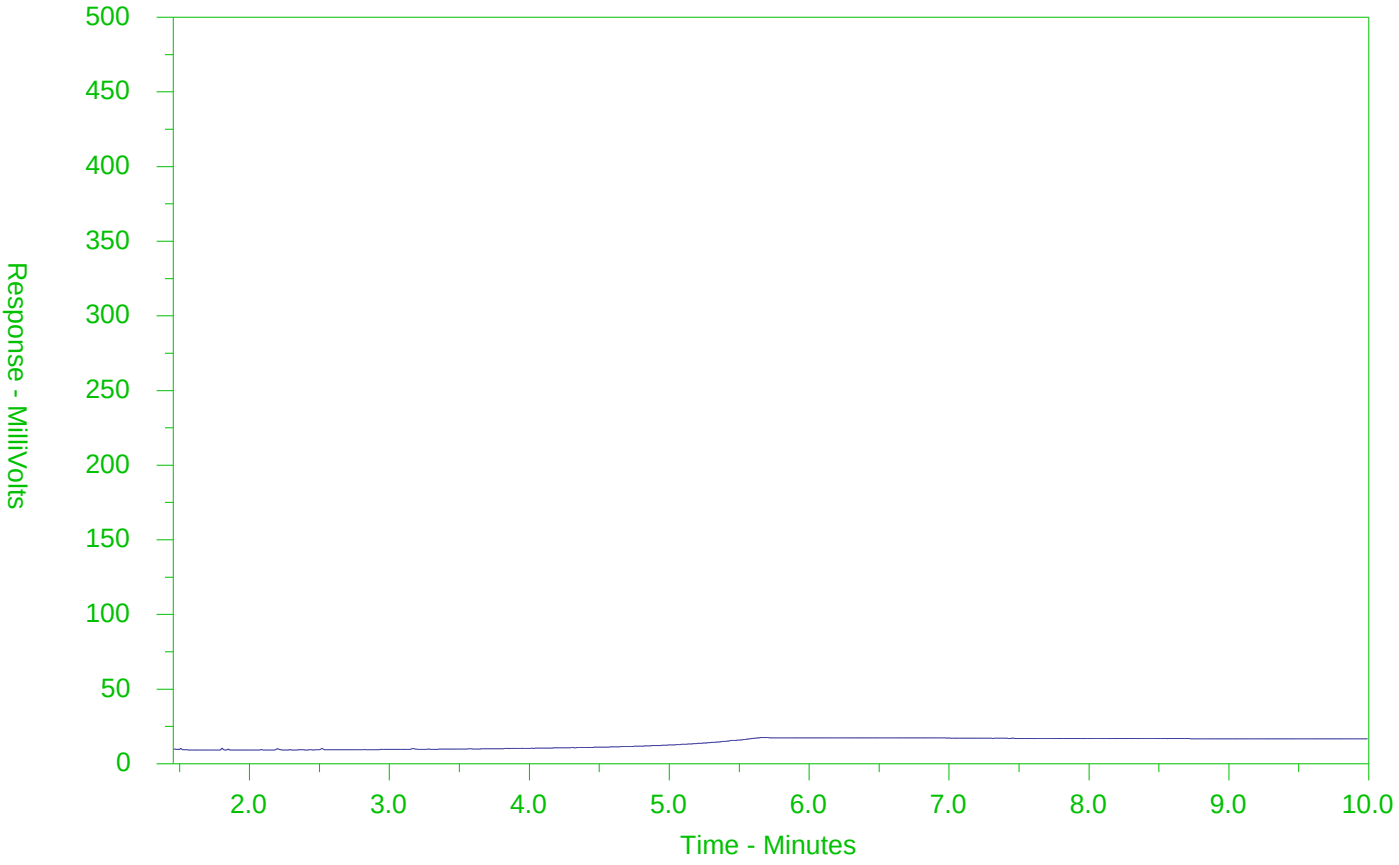
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-4
Client Sample ID: GW-11149990-051118-TW-005



←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.

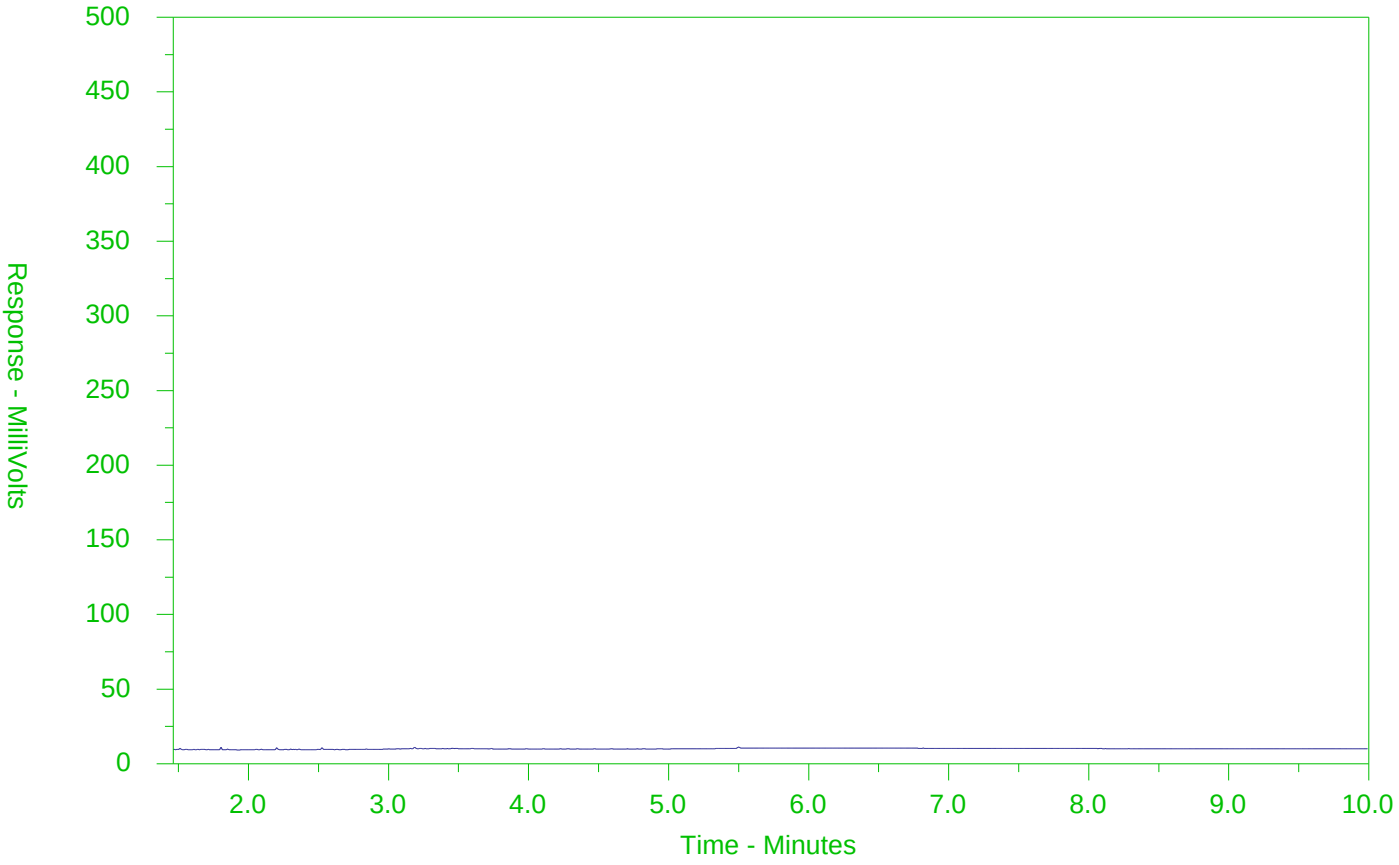
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-5
Client Sample ID: GW-11149990-051118-TW-006



←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.

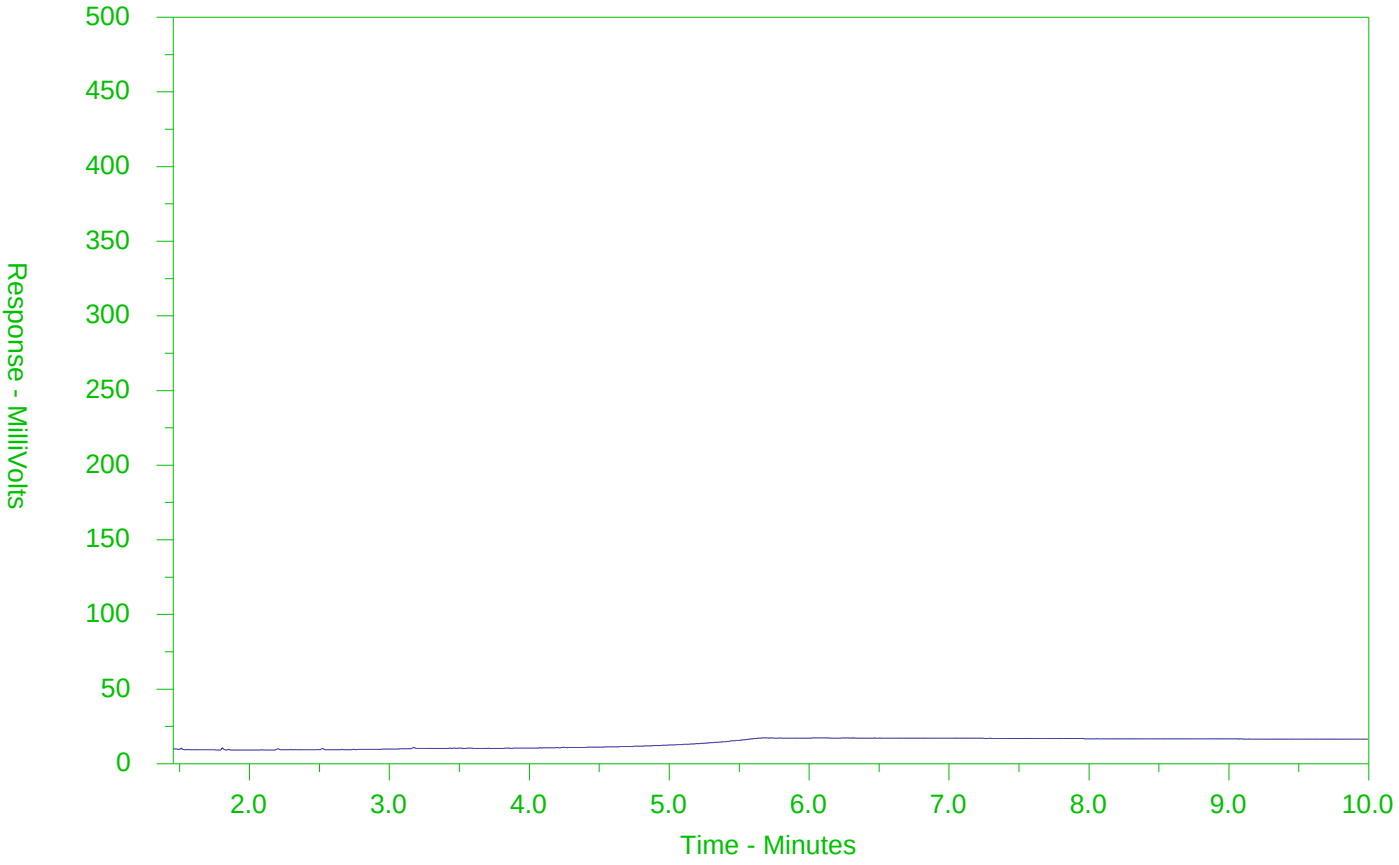
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-6
Client Sample ID: GW-11149990-051118-TW-007



←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.

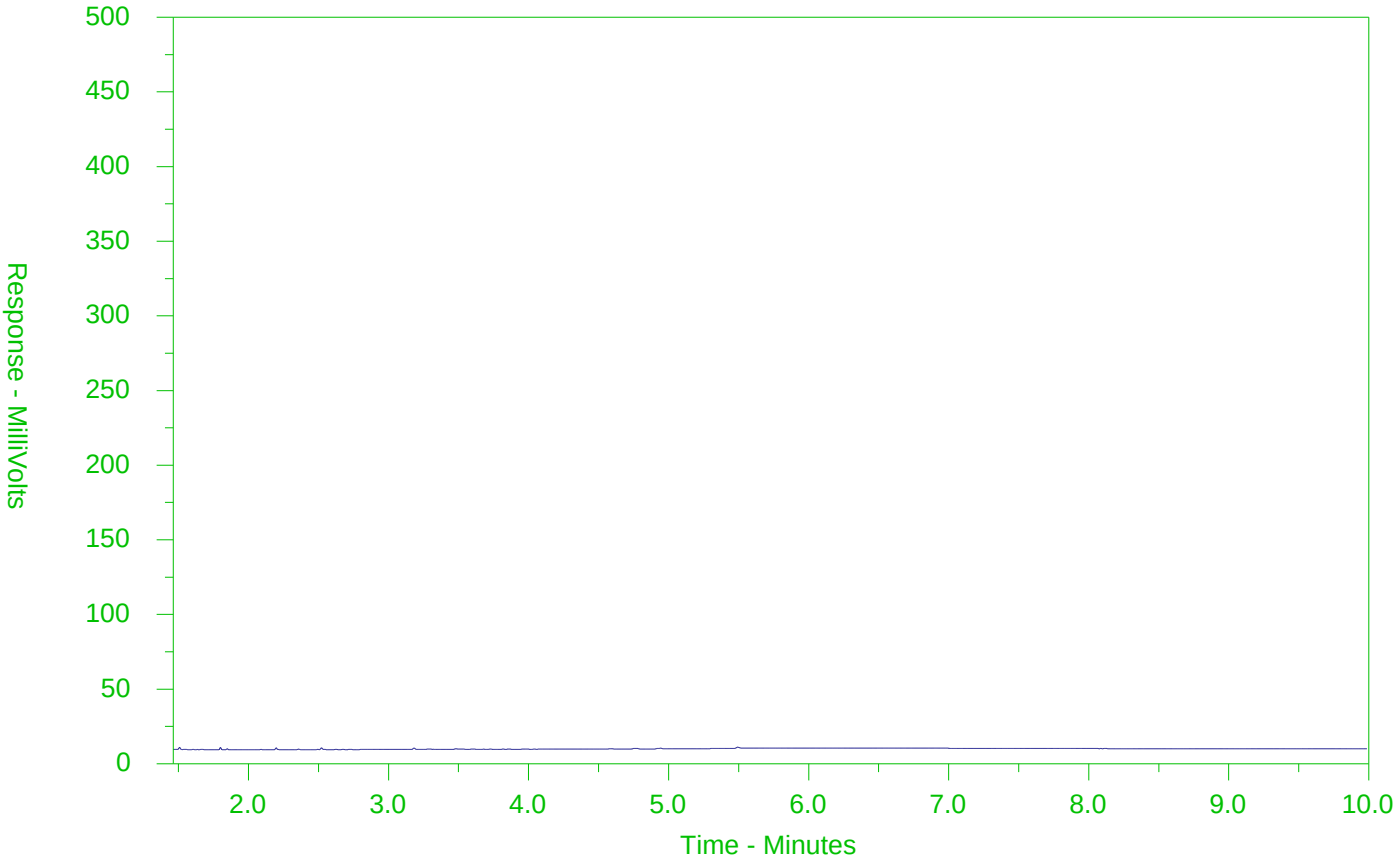
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-7
Client Sample ID: GW-11149990-051118-TW-008



←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.

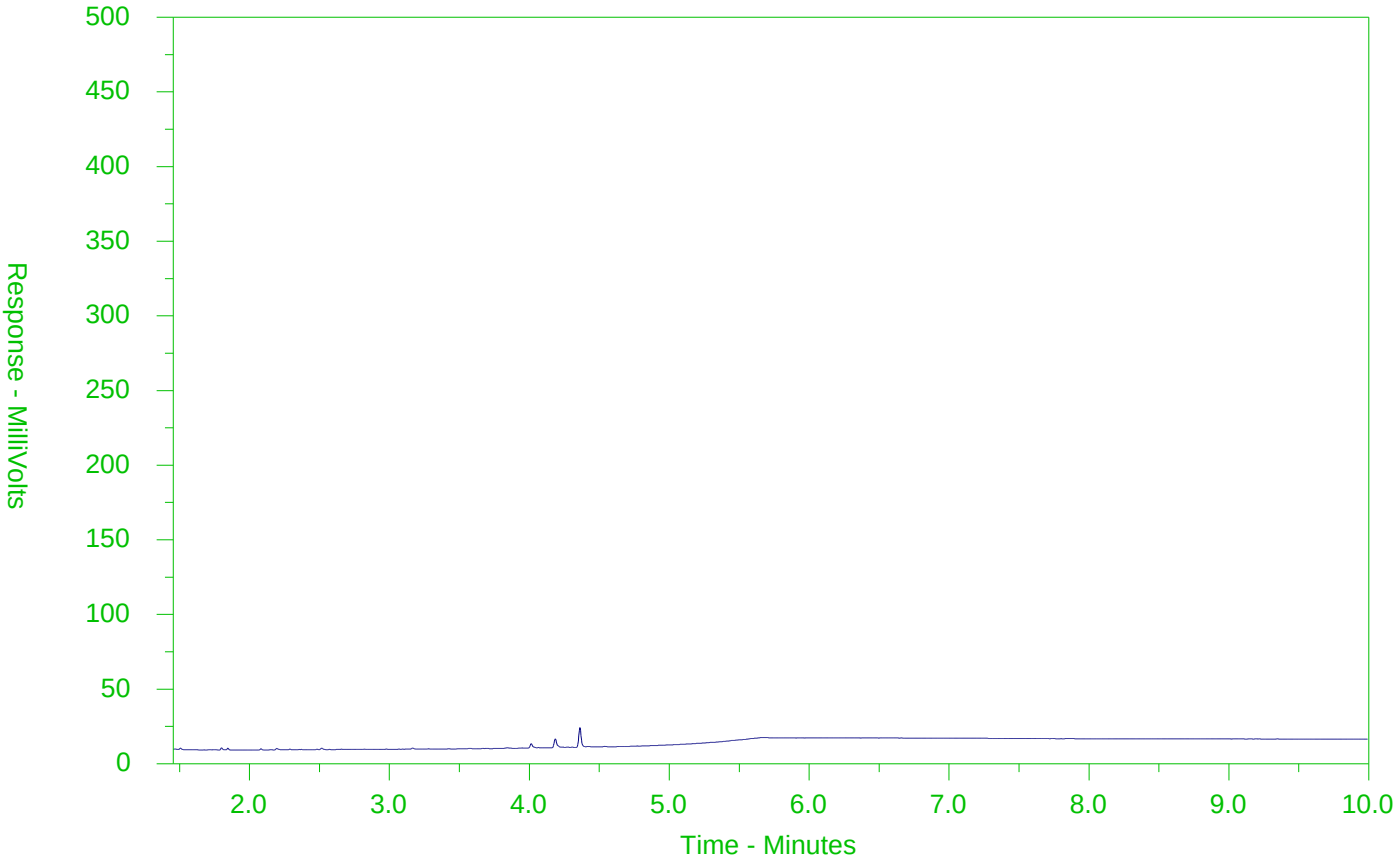
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-8
Client Sample ID: GW-11149990-051118-TW-009



←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.

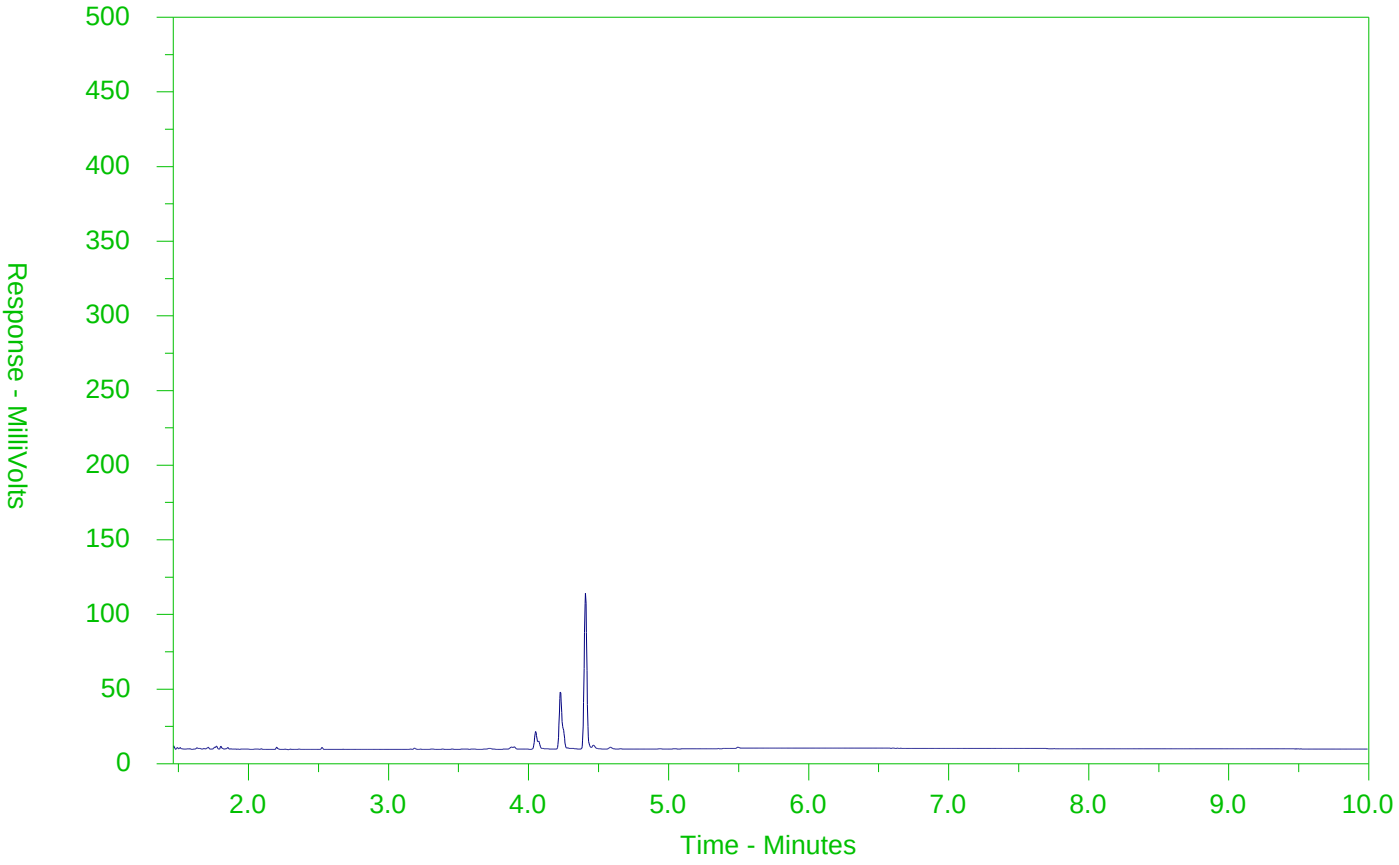
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-9
Client Sample ID: GW-11149990-051118-TW-010



←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.

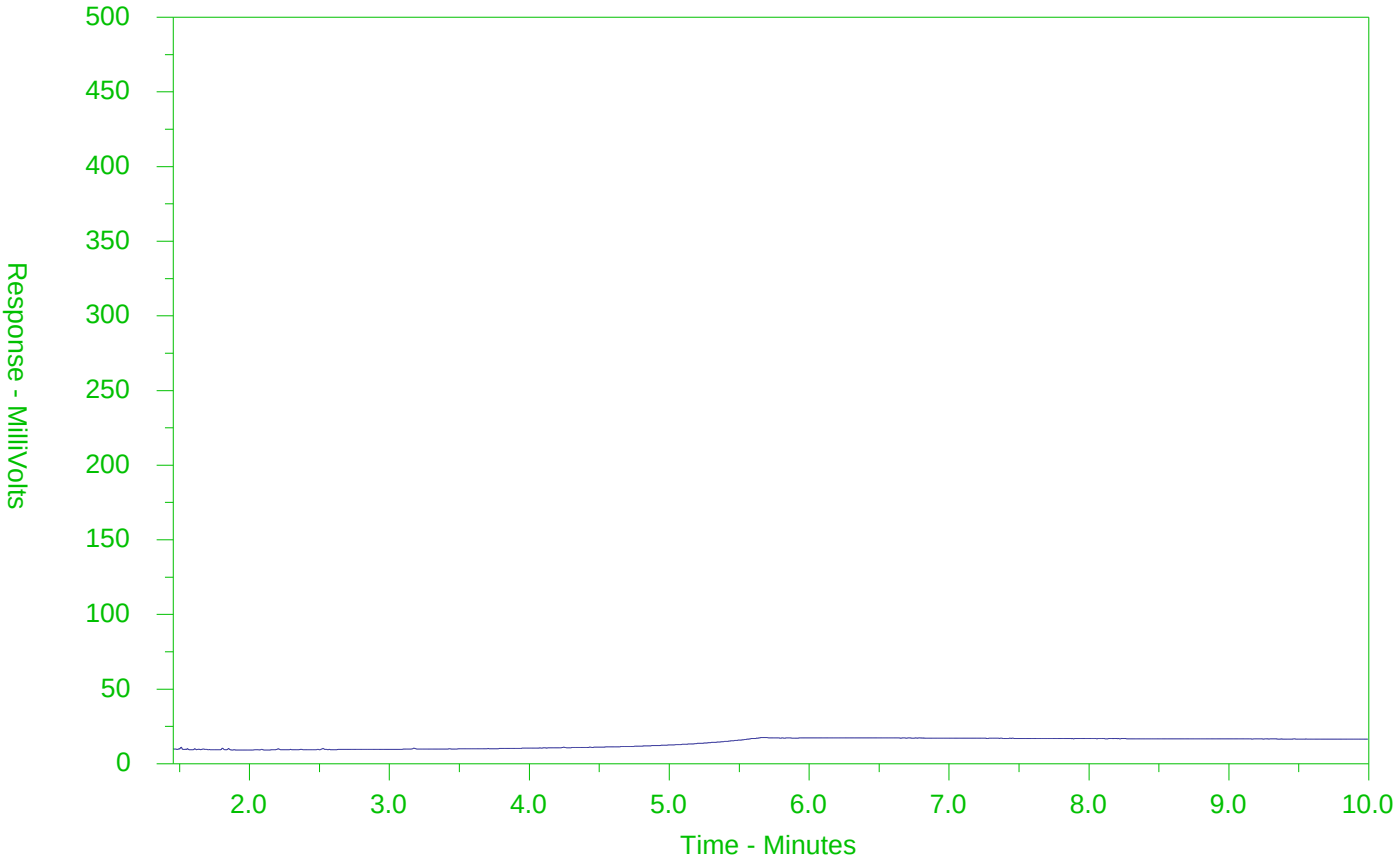
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-10
Client Sample ID: GW-11149990-051118-TW-011



←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.

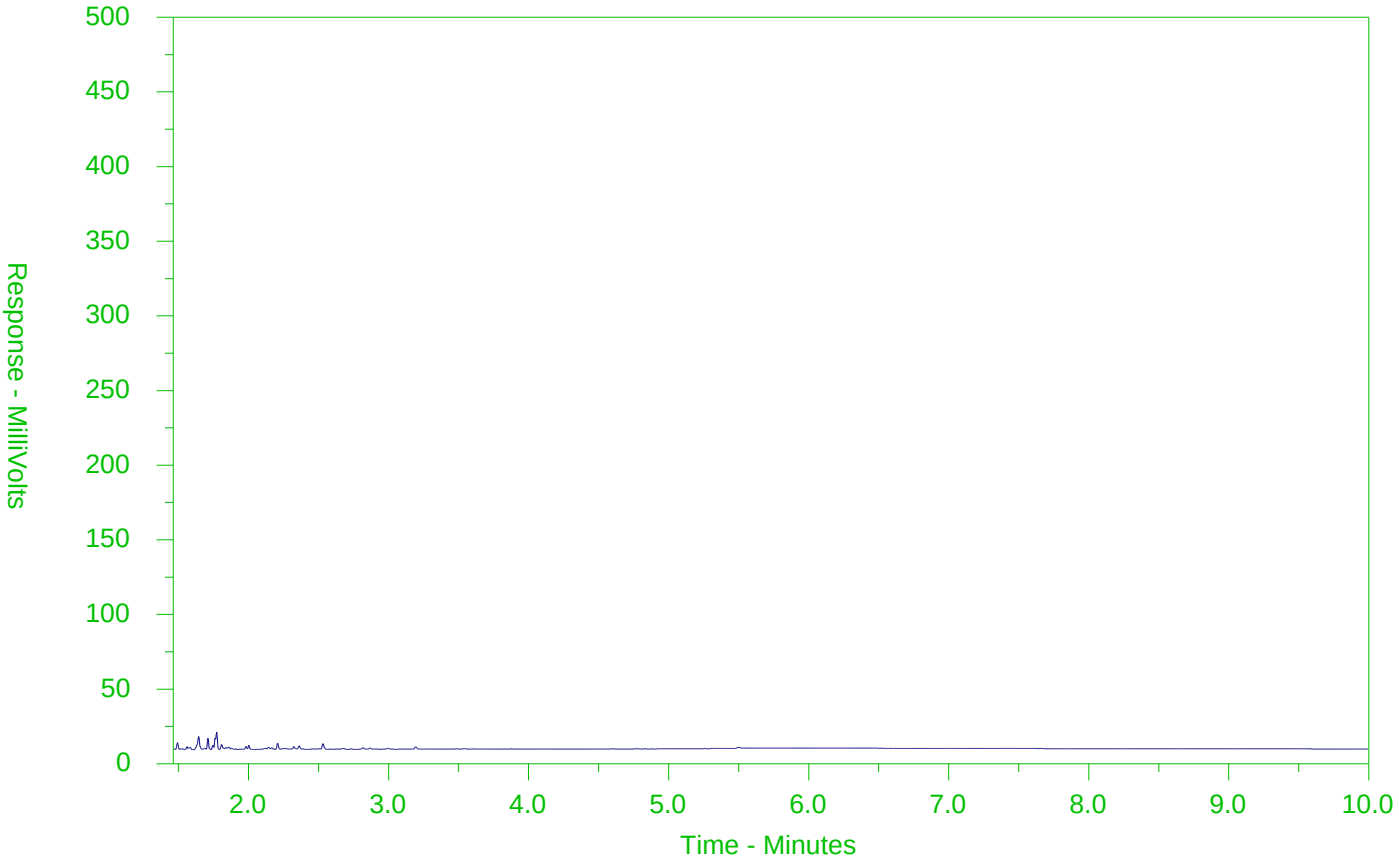
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-11
Client Sample ID: GW-11149990-051118-TW-012



←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.

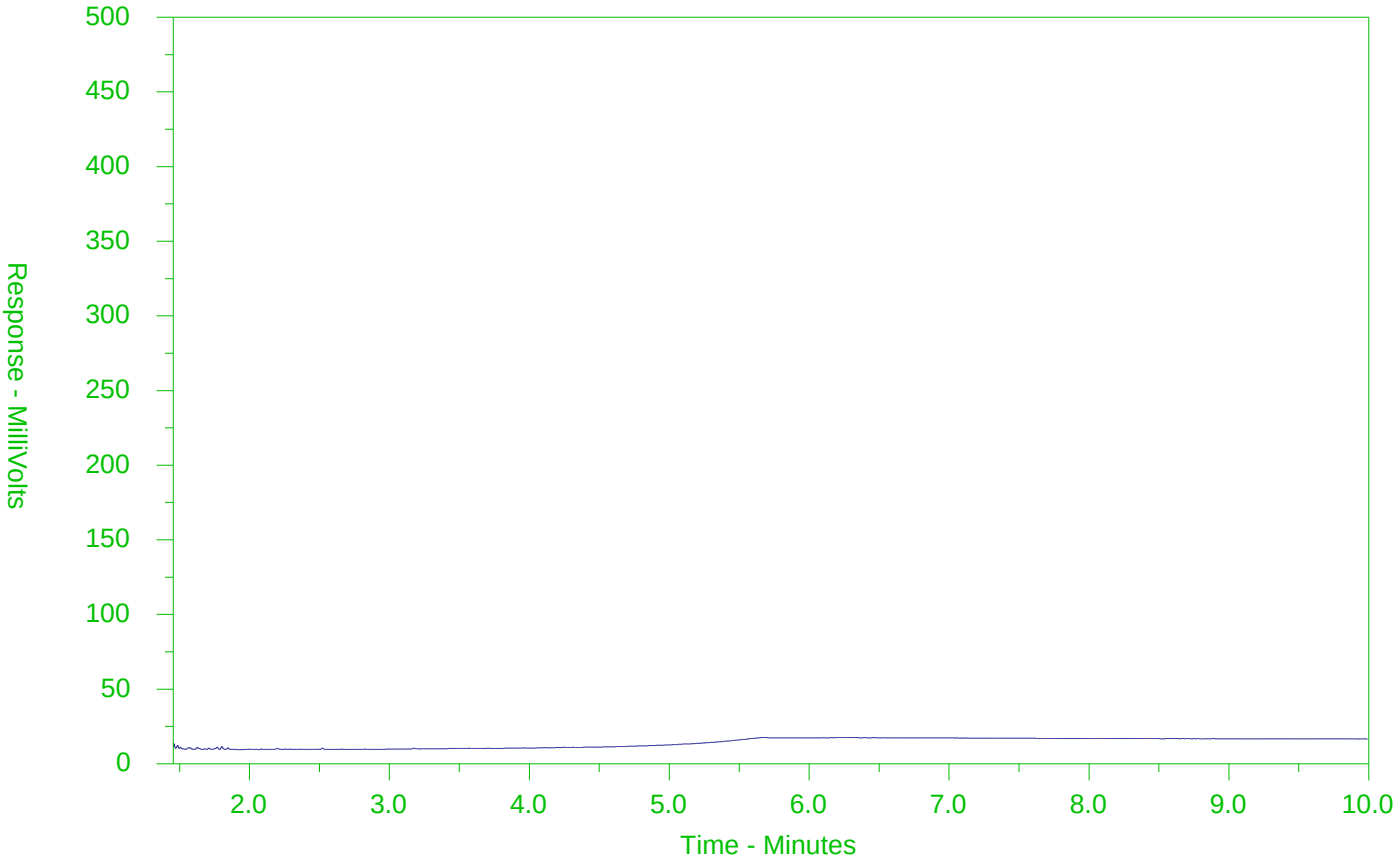
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-12
Client Sample ID: GW-11149990-051118-TW-013



←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.

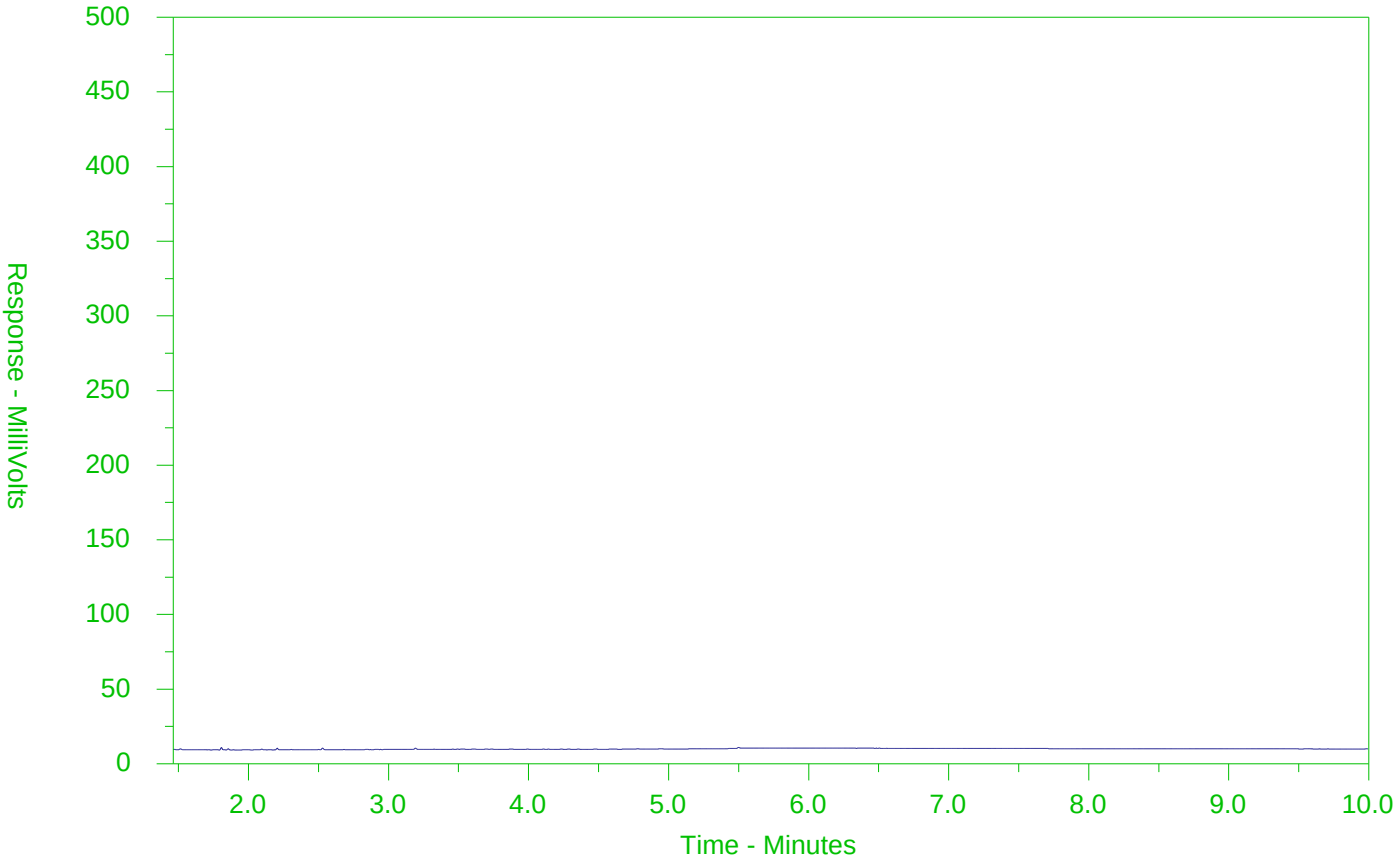
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2093541-13
Client Sample ID: GW-11149990-051118-TW-014



←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

L2093541-COFC

Affix ALS barcode label here (lab use only)

COC Number: 15 - - -

Page 1 of 2

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	GHD LIMITED Acct# 13791	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	Regular [R] ☒ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Jennifer Balkwill	Quality Control (QC) Report with Report ☑ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	519-884-0510	☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	Date and Time Required for all E&P TATs:
Street:	651 Colby Drive	Email 1 or Fax Jennifer.Balkwill@ghd.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Waterloo / Ontario	Email 2 See PO	
Postal Code:	N2V 1C2	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:	GHD LIMITED	Email 1 or Fax Jennifer.Balkwill@ghd.com	
Contact:	Jennifer Balkwill	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote#:		AFE/Cost Center:	PO#
Job #:	11149990-04	Major/Minor Code:	Routing Code:
PO / AFE:	73511036-1	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2093541 CG 12B

ALS Contact: Rick H

Sampler: T. Wiltmaier

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	VOC,F1-F4	SVOCs	153 M&I pkg	Phenols-4AAP	ALK, TDS	TKN,TP	DOC	NH3	Anions3 (N2N3,SO4)	WT-CA-D, WT-MG-D, WT-FE-D, WT-MN-D	Hardness-Calc		VOC,F1 (Trip Blank)	Number of Containers
1	GW-11149990-05_11_18-TW-001	11-May-18	10:00	Water	R	R	R											
~~—~~	~~GW-11149990-05_18-TW-002~~			~~Water~~	~~R~~	~~R~~	~~R~~											
2	GW-11149990-05_11_18-TW-003	11-May-18	15:20	Water	R	R	R											
3	GW-11149990-05_11_18-TW-004	"	16:05	Water	R	R	R	R	R	R	R	R	R	R	R			
4	GW-11149990-05_11_18-TW-005		12:50	Water	R	R	R	R	R	R	R	R	R	R	R			
5	GW-11149990-05_11_18-TW-006		12:50	Water	R	R	R	R	R	R	R	R	R	R	R			
6	GW-11149990-05_11_18-TW-007		9:20	Water	R	R	R	R	R	R	R	R	R	R	R			
7	GW-11149990-05_11_18-TW-008		9:20	Water	R	R	R	R	R	R	R	R	R	R	R			
8	GW-11149990-05_11_18-TW-009		11:35	Water	R	R	R	R	R	R	R	R	R	R	R			
9	GW-11149990-05_11_18-TW-010		10:25	Water	R	R	R	R	R	R	R	R	R	R	R			
10	GW-11149990-05_11_18-TW-011		12:30	Water	R	R	R	R	R	R	R	R	R	R	R			
11	GW-11149990-05_11_18-TW-012		14:15	Water	R	R	R	R	R	R	R	R	R	R	R			

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	All metals, CrVI, Hg and DOC bottles are field filtered.
Are samples for human drinking water 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		
			8.9°C	5.9°C	8.7°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Tyler Wiltmaier	Date: 11-May-2018	Time:	Received by:	Date:	Time:	Received by:	Date: 11-May-18	Time: 19:30

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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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2093541-COFC

COC Number: 15 -

Page 2 of 2

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	GHD LIMITED Acct# 13791	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Jennifer Balkwill	Quality Control (QC) Report with Report ☑ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	519-884-0510	☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	Date and Time Required for all E&P TATs:
Street:	651 Colby Drive	Email 1 or Fax Jennifer.Balkwill@ghd.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Waterloo / Ontario	Email 2 See PO	
Postal Code:	N2V 1C2	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:	GHD LIMITED	Email 1 or Fax Jennifer.Balkwill@ghd.com	
Contact:	Jennifer Balkwill	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote#:		AFE/Cost Center:	PO#
Job #:	11149990-04	Major/Minor Code:	Routing Code:
PO / AFE:	73511036-1	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2093541 CG 12B

ALS Contact: Rick H Sampler: T. Whittaker

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	VOC,F1-F4	SVOCs	153 M&I pkg	Phenols-4AAP	ALK, TDS	TKN,TP	DOC	NH3	Anions3 (N2N3,SO4)	WT-CA-D, WT-MG-D, WT-FE-D, WT-MN-D	Hardness-Calc		VOC,F1 (Trip Blank)	Number of Containers
12	GW-11149990-05 11 18-TW-013	11-May-18	17:25	Water	R	R	R	R	R	R	R	R	R	R	R			
13	GW-11149990-05 11 18-TW-014	11-May-18	17:40	Water	R	R	R	R	R	R	R	R	R	R	R			
	~~GW-11149990-05 18-TW-015~~			~~Water~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~GW-11149990-05 18-TW-016~~			~~Water~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~GW-11149990-05 18-TW-017~~			~~Water~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~GW-11149990-05 18-TW-~~			~~Water~~														
	~~GW-11149990-05 18-TW-~~			~~Water~~														
14	TB-11149990-05118 Trip Blank -TW-001	11-May-18	~	Water													R	2
				Water														
				Water														
				Water														
				Water														

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	
Are samples for human drinking water 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	
			8.9°C	5.9°C 7.9°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: T. Whittaker, Mer Whittmaier	Date: 11-May-2018	Time:	Received by:	Date:	Time:	Received by:	Date: 11-May-18	Time: 19:39

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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.

GHD Limited (Waterloo)
ATTN: JENNIFER BALKWILL
651 COLBY DRIVE
WATERLOO ON N2V 1C2

Date Received: 01-JUN-18
Report Date: 26-JUL-18 10:20 (MT)
Version: FINAL REV. 2

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2105012

Project P.O. #: 73511036-2
Job Reference: 11149990-04
C of C Numbers: 17-622302
Legal Site Desc:

Comments: Report #1

Rick Hawthorne
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-3 S-11149990-053018-TW-24 Sampled By: TYLER W on 30-MAY-18 @ 14:00 Matrix: SOIL							
Physical Tests							
Conductivity	0.217		0.0040	mS/cm		08-JUN-18	R4076428
% Moisture	14.8		0.10	%	08-JUN-18	09-JUN-18	R4076824
pH	7.56		0.10	pH units		08-JUN-18	R4076192
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	07-JUN-18	08-JUN-18	R4078048
Saturated Paste Extractables							
SAR	3.24		0.10	SAR		08-JUN-18	R4076234
Calcium (Ca)	5.2		1.0	mg/L		08-JUN-18	R4076234
Magnesium (Mg)	2.3		1.0	mg/L		08-JUN-18	R4076234
Sodium (Na)	35.2		1.0	mg/L		08-JUN-18	R4076234
Metals							
Antimony (Sb)	1.2		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Arsenic (As)	5.3		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Barium (Ba)	28.7		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Beryllium (Be)	<0.50		0.50	ug/g	06-JUN-18	07-JUN-18	R4075827
Boron (B)	<5.0		5.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Boron (B), Hot Water Ext.	0.13		0.10	ug/g	08-JUN-18	08-JUN-18	R4076044
Cadmium (Cd)	<0.50		0.50	ug/g	06-JUN-18	07-JUN-18	R4075827
Chromium (Cr)	9.1		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Cobalt (Co)	20.4		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Copper (Cu)	53.2		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Lead (Pb)	35.4		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Mercury (Hg)	0.0823		0.0050	ug/g	06-JUN-18	07-JUN-18	R4075062
Molybdenum (Mo)	1.5		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Nickel (Ni)	10.1		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Selenium (Se)	<1.0		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Silver (Ag)	<0.20		0.20	ug/g	06-JUN-18	07-JUN-18	R4075827
Thallium (Tl)	<0.50		0.50	ug/g	06-JUN-18	07-JUN-18	R4075827
Uranium (U)	<1.0		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Vanadium (V)	13.6		1.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Zinc (Zn)	113		5.0	ug/g	06-JUN-18	07-JUN-18	R4075827
Speciated Metals							
Chromium, Hexavalent	0.48		0.20	ug/g	08-JUN-18	11-JUN-18	R4078441
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
Benzene	0.0075		0.0068	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromodichloromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromoform	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromomethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Carbon tetrachloride	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Chlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Dibromochloromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-3 S-11149990-053018-TW-24 Sampled By: TYLER W on 30-MAY-18 @ 14:00 Matrix: SOIL							
Volatile Organic Compounds							
Chloroform	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dibromoethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,3-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,4-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Dichlorodifluoromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1-Dichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Methylene Chloride	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichloropropane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-JUN-18	
Ethylbenzene	<0.018		0.018	ug/g	04-JUN-18	05-JUN-18	R4069217
n-Hexane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Methyl Ethyl Ketone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
MTBE	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Styrene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Tetrachloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Toluene	<0.080		0.080	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,1-Trichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,2-Trichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Trichloroethylene	<0.010		0.010	ug/g	04-JUN-18	05-JUN-18	R4069217
Trichlorofluoromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Vinyl chloride	<0.020		0.020	ug/g	04-JUN-18	05-JUN-18	R4069217
o-Xylene	<0.020		0.020	ug/g	04-JUN-18	05-JUN-18	R4069217
m+p-Xylenes	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
Xylenes (Total)	<0.050		0.050	ug/g		11-JUN-18	
Surrogate: 4-Bromofluorobenzene	97.0		50-140	%	04-JUN-18	05-JUN-18	R4069217
Surrogate: 1,4-Difluorobenzene	99.9		50-140	%	04-JUN-18	05-JUN-18	R4069217
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	04-JUN-18	05-JUN-18	R4069217
F1-BTEX	<5.0		5.0	ug/g		13-JUN-18	
F2 (C10-C16)	18		10	ug/g	07-JUN-18	08-JUN-18	R4076279
F2-Naphth	18		10	ug/g		13-JUN-18	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-3 S-11149990-053018-TW-24 Sampled By: TYLER W on 30-MAY-18 @ 14:00 Matrix: SOIL							
Hydrocarbons							
F3 (C16-C34)	214		50	ug/g	07-JUN-18	08-JUN-18	R4076279
F3-PAH	197		50	ug/g		13-JUN-18	
F4 (C34-C50)	178		50	ug/g	07-JUN-18	08-JUN-18	R4076279
F4G-SG (GHH-Silica)	540		250	ug/g	07-JUN-18	07-JUN-18	R4078948
Total Hydrocarbons (C6-C50)	410		72	ug/g		13-JUN-18	
Chrom. to baseline at nC50	NO				07-JUN-18	08-JUN-18	R4076279
Surrogate: 2-Bromobenzotrifluoride	92.7		60-140	%	07-JUN-18	08-JUN-18	R4076279
Surrogate: 3,4-Dichlorotoluene	84.5		60-140	%	04-JUN-18	05-JUN-18	R4069217
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	0.149		0.042	ug/g		13-JUN-18	
Semi-Volatile Organics							
Acenaphthene	0.093		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Acenaphthylene	0.189		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Anthracene	0.472		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(a)anthracene	2.07		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(a)pyrene	2.31		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(b)fluoranthene	1.81		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(ghi)perylene	1.24		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(k)fluoranthene	1.90		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Biphenyl	<0.050		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
4-Chloroaniline	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Bis(2-chloroethyl)ether	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Bis(2-chloroisopropyl)ether	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2-Chlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Chrysene	1.84		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Dibenzo(a,h)anthracene	0.252		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
3,3'-Dichlorobenzidine	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dichlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Diethylphthalate	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Dimethylphthalate	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dimethylphenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dinitrophenol	<1.0		1.0	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dinitrotoluene	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,6-Dinitrotoluene	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4+2,6-Dinitrotoluene	<0.14		0.14	ug/g		13-JUN-18	
Bis(2-ethylhexyl)phthalate	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Fluoranthene	3.29		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Fluorene	0.091		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Indeno(1,2,3-cd)pyrene	1.56		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
1-Methylnaphthalene	0.067		0.030	ug/g	08-JUN-18	13-JUN-18	R4081248
2-Methylnaphthalene	0.081		0.030	ug/g	08-JUN-18	13-JUN-18	R4081248

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-3 S-11149990-053018-TW-24 Sampled By: TYLER W on 30-MAY-18 @ 14:00 Matrix: SOIL							
Semi-Volatile Organics							
Naphthalene	0.161		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Pentachlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Phenanthrene	1.41		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Phenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Pyrene	3.22		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
1,2,4-Trichlorobenzene	<0.050		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4,5-Trichlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4,6-Trichlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Surrogate: 2-Fluorobiphenyl	89.3		50-140	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: Nitrobenzene d5	84.9		50-140	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: Phenol d5	87.8		30-130	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: p-Terphenyl d14	87.9		50-140	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: 2,4,6-Tribromophenol	82.9		50-140	%	08-JUN-18	13-JUN-18	R4081248
Polychlorinated Biphenyls							
Aroclor 1242	<0.10	DLM	0.10	ug/g	11-JUN-18	11-JUN-18	R4077931
Aroclor 1248	<0.10	DLM	0.10	ug/g	11-JUN-18	11-JUN-18	R4077931
Aroclor 1254	<0.10	DLM	0.10	ug/g	11-JUN-18	11-JUN-18	R4077931
Aroclor 1260	<0.10	DLM	0.10	ug/g	11-JUN-18	11-JUN-18	R4077931
Total PCBs	<0.20	DLM	0.20	ug/g	11-JUN-18	11-JUN-18	R4077931
Surrogate: d14-Terphenyl	103.0		60-140	%	11-JUN-18	11-JUN-18	R4077931
L2105012-4 S-11149990-053018-TW-25 Sampled By: TYLER W on 30-MAY-18 @ 14:15 Matrix: SOIL							
Physical Tests							
Conductivity	1.48		0.0040	mS/cm		08-JUN-18	R4076428
% Moisture	36.7		0.10	%	08-JUN-18	09-JUN-18	R4076824
pH	7.26		0.10	pH units		08-JUN-18	R4076192
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	07-JUN-18	08-JUN-18	R4078048
Saturated Paste Extractables							
SAR	11.8		0.10	SAR		08-JUN-18	R4076234
Calcium (Ca)	28.6		1.0	mg/L		08-JUN-18	R4076234
Magnesium (Mg)	1.5		1.0	mg/L		08-JUN-18	R4076234
Sodium (Na)	240		1.0	mg/L		08-JUN-18	R4076234
Metals							
Antimony (Sb)	2.2		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Arsenic (As)	10.6		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Barium (Ba)	52.7		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Beryllium (Be)	<0.50		0.50	ug/g	07-JUN-18	08-JUN-18	R4076202
Boron (B)	9.6		5.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Boron (B), Hot Water Ext.	0.90		0.10	ug/g	07-JUN-18	07-JUN-18	R4075761
Cadmium (Cd)	2.06		0.50	ug/g	07-JUN-18	08-JUN-18	R4076202

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-4 S-11149990-053018-TW-25 Sampled By: TYLER W on 30-MAY-18 @ 14:15 Matrix: SOIL							
Metals							
Chromium (Cr)	23.3		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Cobalt (Co)	7.6		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Copper (Cu)	66.8		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Lead (Pb)	85.3		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Mercury (Hg)	0.285		0.0050	ug/g	07-JUN-18	08-JUN-18	R4076045
Molybdenum (Mo)	1.5		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Nickel (Ni)	17.6		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Selenium (Se)	<1.0		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Silver (Ag)	<0.20		0.20	ug/g	07-JUN-18	08-JUN-18	R4076202
Thallium (Tl)	<0.50		0.50	ug/g	07-JUN-18	08-JUN-18	R4076202
Uranium (U)	<1.0		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Vanadium (V)	23.2		1.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Zinc (Zn)	409		5.0	ug/g	07-JUN-18	08-JUN-18	R4076202
Speciated Metals							
Chromium, Hexavalent	<0.20		0.20	ug/g	08-JUN-18	11-JUN-18	R4078441
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
Benzene	<0.010	DLHM	0.010	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromodichloromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromoform	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromomethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Carbon tetrachloride	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Chlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Dibromochloromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Chloroform	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dibromoethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,3-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,4-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Dichlorodifluoromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1-Dichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Methylene Chloride	<0.080	DLQ	0.080	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichloropropane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-JUN-18	
Ethylbenzene	<0.018		0.018	ug/g	04-JUN-18	05-JUN-18	R4069217

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-4 S-11149990-053018-TW-25 Sampled By: TYLER W on 30-MAY-18 @ 14:15 Matrix: SOIL							
Volatile Organic Compounds							
n-Hexane	0.132		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Methyl Ethyl Ketone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
MTBE	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Styrene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Tetrachloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Toluene	<0.080		0.080	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,1-Trichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,2-Trichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Trichloroethylene	<0.010		0.010	ug/g	04-JUN-18	05-JUN-18	R4069217
Trichlorofluoromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Vinyl chloride	<0.020		0.020	ug/g	04-JUN-18	05-JUN-18	R4069217
o-Xylene	<0.020		0.020	ug/g	04-JUN-18	05-JUN-18	R4069217
m+p-Xylenes	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
Xylenes (Total)	<0.050		0.050	ug/g		11-JUN-18	
Surrogate: 4-Bromofluorobenzene	101.2		50-140	%	04-JUN-18	05-JUN-18	R4069217
Surrogate: 1,4-Difluorobenzene	104.3		50-140	%	04-JUN-18	05-JUN-18	R4069217
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	04-JUN-18	05-JUN-18	R4069217
F1-BTEX	<5.0		5.0	ug/g		13-JUN-18	
F2 (C10-C16)	<10		10	ug/g	07-JUN-18	08-JUN-18	R4076279
F2-Naphth	<10		10	ug/g		13-JUN-18	
F3 (C16-C34)	246		50	ug/g	07-JUN-18	08-JUN-18	R4076279
F3-PAH	241		50	ug/g		13-JUN-18	
F4 (C34-C50)	115		50	ug/g	07-JUN-18	08-JUN-18	R4076279
F4G-SG (GHH-Silica)	370		250	ug/g	07-JUN-18	07-JUN-18	R4078948
Total Hydrocarbons (C6-C50)	361		72	ug/g		13-JUN-18	
Chrom. to baseline at nC50	NO				07-JUN-18	08-JUN-18	R4076279
Surrogate: 2-Bromobenzotrifluoride	87.0		60-140	%	07-JUN-18	08-JUN-18	R4076279
Surrogate: 3,4-Dichlorotoluene	90.4		60-140	%	04-JUN-18	05-JUN-18	R4069217
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	<0.042		0.042	ug/g		13-JUN-18	
Semi-Volatile Organics							
Acenaphthene	<0.050		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Acenaphthylene	0.084		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Anthracene	0.125		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(a)anthracene	0.648		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(a)pyrene	0.688		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(b)fluoranthene	0.599		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Benzo(ghi)perylene	0.386		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-4 S-11149990-053018-TW-25 Sampled By: TYLER W on 30-MAY-18 @ 14:15 Matrix: SOIL							
Semi-Volatile Organics							
Benzo(k)fluoranthene	0.629		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Biphenyl	<0.050		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
4-Chloroaniline	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Bis(2-chloroethyl)ether	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Bis(2-chloroisopropyl)ether	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2-Chlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Chrysene	0.613		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Dibenzo(a,h)anthracene	0.084		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
3,3'-Dichlorobenzidine	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dichlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Diethylphthalate	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Dimethylphthalate	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dimethylphenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dinitrophenol	<1.0		1.0	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4-Dinitrotoluene	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,6-Dinitrotoluene	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4+2,6-Dinitrotoluene	<0.14		0.14	ug/g		13-JUN-18	
Bis(2-ethylhexyl)phthalate	0.17		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Fluoranthene	1.06		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Fluorene	0.074		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Indeno(1,2,3-cd)pyrene	0.500		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
1-Methylnaphthalene	<0.030		0.030	ug/g	08-JUN-18	13-JUN-18	R4081248
2-Methylnaphthalene	<0.030		0.030	ug/g	08-JUN-18	13-JUN-18	R4081248
Naphthalene	<0.050		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Pentachlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Phenanthrene	0.278		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
Phenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Pyrene	0.925		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
1,2,4-Trichlorobenzene	<0.050		0.050	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4,5-Trichlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
2,4,6-Trichlorophenol	<0.10		0.10	ug/g	08-JUN-18	13-JUN-18	R4081248
Surrogate: 2-Fluorobiphenyl	89.3		50-140	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: Nitrobenzene d5	84.8		50-140	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: Phenol d5	86.4		30-130	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: p-Terphenyl d14	87.6		50-140	%	08-JUN-18	13-JUN-18	R4081248
Surrogate: 2,4,6-Tribromophenol	87.4		50-140	%	08-JUN-18	13-JUN-18	R4081248
Polychlorinated Biphenyls							
Aroclor 1242	<0.010		0.010	ug/g	11-JUN-18	11-JUN-18	R4077931
Aroclor 1248	<0.010		0.010	ug/g	11-JUN-18	11-JUN-18	R4077931
Aroclor 1254	<0.010		0.010	ug/g	11-JUN-18	11-JUN-18	R4077931
Aroclor 1260	<0.010		0.010	ug/g	11-JUN-18	11-JUN-18	R4077931

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-4 S-11149990-053018-TW-25 Sampled By: TYLER W on 30-MAY-18 @ 14:15 Matrix: SOIL							
Polychlorinated Biphenyls							
Total PCBs	<0.020		0.020	ug/g	11-JUN-18	11-JUN-18	R4077931
Surrogate: d14-Terphenyl	112.0		60-140	%	11-JUN-18	11-JUN-18	R4077931
L2105012-5 TB-11149990-053018-TW-02 Sampled By: TYLER W on 30-MAY-18 Matrix: SOIL							
Physical Tests							
% Moisture	<0.10		0.10	%	08-JUN-18	09-JUN-18	R4076824
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
Benzene	<0.0068		0.0068	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromodichloromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromoform	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Bromomethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Carbon tetrachloride	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Chlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Dibromochloromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Chloroform	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dibromoethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,3-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,4-Dichlorobenzene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Dichlorodifluoromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1-Dichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Methylene Chloride	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,2-Dichloropropane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g		11-JUN-18	
Ethylbenzene	<0.018		0.018	ug/g	04-JUN-18	05-JUN-18	R4069217
n-Hexane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Methyl Ethyl Ketone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	04-JUN-18	05-JUN-18	R4069217
MTBE	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Styrene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Tetrachloroethylene	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Toluene	<0.080		0.080	ug/g	04-JUN-18	05-JUN-18	R4069217

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105012-5 TB-11149990-053018-TW-02 Sampled By: TYLER W on 30-MAY-18 Matrix: SOIL							
Volatile Organic Compounds							
1,1,1-Trichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
1,1,2-Trichloroethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Trichloroethylene	<0.010		0.010	ug/g	04-JUN-18	05-JUN-18	R4069217
Trichlorofluoromethane	<0.050		0.050	ug/g	04-JUN-18	05-JUN-18	R4069217
Vinyl chloride	<0.020		0.020	ug/g	04-JUN-18	05-JUN-18	R4069217
o-Xylene	<0.020		0.020	ug/g	04-JUN-18	05-JUN-18	R4069217
m+p-Xylenes	<0.030		0.030	ug/g	04-JUN-18	05-JUN-18	R4069217
Xylenes (Total)	<0.050		0.050	ug/g		11-JUN-18	
Surrogate: 4-Bromofluorobenzene	113.4		50-140	%	04-JUN-18	05-JUN-18	R4069217
Surrogate: 1,4-Difluorobenzene	117.3		50-140	%	04-JUN-18	05-JUN-18	R4069217
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	04-JUN-18	05-JUN-18	R4069217
Surrogate: 3,4-Dichlorotoluene	97.6		60-140	%	04-JUN-18	05-JUN-18	R4069217

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHM	Detection Limit Adjusted: Sample has High Moisture Content
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Soil	ABN-O.Reg 153/04 (July 2011)	SW846 8270 (511)

Soil and sediment samples are dried by mixing with a desiccant prior to extraction. The extracts are dried, concentrated and exchanged into a solvent and analyzed by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

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).

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).

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).

DINITROTOL-CALC-WT	Soil	ABN-Calculated Parameters	SW846 8270
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).

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:

Reference Information

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.

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).

F4G-ADD-511-WT Soil F4G SG-O.Reg 153/04 (July 2011) MOE DECPH-E3398/CCME TIER 1

F4G, gravimetric analysis, is determined if the chromatogram does not return to baseline at or before C50. A soil sample is extracted with a solvent mix, the solvent is evaporated and the weight of the residue is determined.

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).

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)

This method uses a heated strong acid digestion with HNO3 and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.

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 Gravimetric: Oven Dried

PCB-511-WT Soil PCB-O.Reg 153/04 (July 2011) SW846 3510/8082

An aliquot of a solid sample is extracted with a solvent, extract is cleaned up and analyzed on the 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).

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).

Reference Information

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).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed 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), 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.

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

Chain of Custody Numbers:

17-622302

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 weight of sample
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.

Quality Control Report

Workorder: L2105012 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4081248								
WG2792266-4 DUP		**WG2792266-3**						
1-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	12-JUN-18
1,2,4-Trichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
2-Chlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
2-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	12-JUN-18
2,4-Dichlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
2,4-Dimethylphenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
2,4-Dinitrophenol		<1.0	<1.0	RPD-NA	ug/g	N/A	40	12-JUN-18
2,4-Dinitrotoluene		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
2,4,5-Trichlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
2,4,6-Trichlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
2,6-Dinitrotoluene		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
3,3'-Dichlorobenzidine		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
4-Chloroaniline		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Acenaphthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Benzo(b)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Benzo(ghi)perylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Biphenyl		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Bis(2-chloroethyl)ether		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Bis(2-chloroisopropyl)ether		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Bis(2-ethylhexyl)phthalate		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Chrysene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Dibenzo(a,h)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Diethylphthalate		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Dimethylphthalate		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Naphthalene		<0.050	<0.050		ug/g			12-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4081248								
WG2792266-4 DUP		**WG2792266-3**						
Naphthalene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Pentachlorophenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Phenanthrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
Phenol		<0.10	<0.10	RPD-NA	ug/g	N/A	40	12-JUN-18
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	12-JUN-18
WG2792266-2 LCS								
1-Methylnaphthalene			88.2		%		50-140	12-JUN-18
1,2,4-Trichlorobenzene			82.3		%		50-140	12-JUN-18
2-Chlorophenol			91.6		%		50-140	12-JUN-18
2-Methylnaphthalene			87.5		%		50-140	12-JUN-18
2,4-Dichlorophenol			93.4		%		50-140	12-JUN-18
2,4-Dimethylphenol			108.9		%		30-130	12-JUN-18
2,4-Dinitrophenol			97.5		%		30-130	12-JUN-18
2,4-Dinitrotoluene			83.4		%		50-140	12-JUN-18
2,4,5-Trichlorophenol			93.7		%		50-140	12-JUN-18
2,4,6-Trichlorophenol			95.0		%		50-140	12-JUN-18
2,6-Dinitrotoluene			83.7		%		50-140	12-JUN-18
3,3'-Dichlorobenzidine			66.5		%		30-130	12-JUN-18
4-Chloroaniline			77.8		%		30-130	12-JUN-18
Acenaphthene			84.1		%		50-140	12-JUN-18
Acenaphthylene			81.6		%		50-140	12-JUN-18
Anthracene			81.9		%		50-140	12-JUN-18
Benzo(a)anthracene			84.1		%		50-140	12-JUN-18
Benzo(a)pyrene			90.1		%		50-140	12-JUN-18
Benzo(b)fluoranthene			99.8		%		50-140	12-JUN-18
Benzo(ghi)perylene			74.6		%		50-140	12-JUN-18
Benzo(k)fluoranthene			93.1		%		50-140	12-JUN-18
Biphenyl			90.3		%		50-140	12-JUN-18
Bis(2-chloroethyl)ether			86.7		%		50-140	12-JUN-18
Bis(2-chloroisopropyl)ether			85.2		%		50-140	12-JUN-18
Bis(2-ethylhexyl)phthalate			83.8		%		50-140	12-JUN-18
Chrysene			97.0		%		50-140	12-JUN-18
Dibenzo(a,h)anthracene			72.0		%		50-140	12-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4081248								
WG2792266-2 LCS								
Diethylphthalate			89.4		%		50-140	12-JUN-18
Dimethylphthalate			89.4		%		50-140	12-JUN-18
Fluoranthene			89.6		%		50-140	12-JUN-18
Fluorene			86.0		%		50-140	12-JUN-18
Indeno(1,2,3-cd)pyrene			70.6		%		50-140	12-JUN-18
Naphthalene			82.6		%		50-140	12-JUN-18
Pentachlorophenol			94.7		%		50-140	12-JUN-18
Phenanthrene			84.8		%		50-140	12-JUN-18
Phenol			98.1		%		30-130	12-JUN-18
Pyrene			90.7		%		50-140	12-JUN-18
WG2792266-1 MB								
1-Methylnaphthalene			<0.030		ug/g		0.03	12-JUN-18
1,2,4-Trichlorobenzene			<0.050		ug/g		0.05	12-JUN-18
2-Chlorophenol			<0.10		ug/g		0.1	12-JUN-18
2-Methylnaphthalene			<0.030		ug/g		0.03	12-JUN-18
2,4-Dichlorophenol			<0.10		ug/g		0.1	12-JUN-18
2,4-Dimethylphenol			<0.10		ug/g		0.1	12-JUN-18
2,4-Dinitrophenol			<1.0		ug/g		1	12-JUN-18
2,4-Dinitrotoluene			<0.10		ug/g		0.1	12-JUN-18
2,4,5-Trichlorophenol			<0.10		ug/g		0.1	12-JUN-18
2,4,6-Trichlorophenol			<0.10		ug/g		0.1	12-JUN-18
2,6-Dinitrotoluene			<0.10		ug/g		0.1	12-JUN-18
3,3'-Dichlorobenzidine			<0.10		ug/g		0.1	12-JUN-18
4-Chloroaniline			<0.10		ug/g		0.1	12-JUN-18
Acenaphthene			<0.050		ug/g		0.05	12-JUN-18
Acenaphthylene			<0.050		ug/g		0.05	12-JUN-18
Anthracene			<0.050		ug/g		0.05	12-JUN-18
Benzo(a)anthracene			<0.050		ug/g		0.05	12-JUN-18
Benzo(a)pyrene			<0.050		ug/g		0.05	12-JUN-18
Benzo(b)fluoranthene			<0.050		ug/g		0.05	12-JUN-18
Benzo(ghi)perylene			<0.050		ug/g		0.05	12-JUN-18
Benzo(k)fluoranthene			<0.050		ug/g		0.05	12-JUN-18
Biphenyl			<0.050		ug/g		0.05	12-JUN-18
Bis(2-chloroethyl)ether			<0.10		ug/g		0.1	12-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4081248								
WG2792266-1 MB								
Bis(2-chloroisopropyl)ether			<0.10		ug/g		0.1	12-JUN-18
Bis(2-ethylhexyl)phthalate			<0.10		ug/g		0.1	12-JUN-18
Chrysene			<0.050		ug/g		0.05	12-JUN-18
Dibenzo(a,h)anthracene			<0.050		ug/g		0.05	12-JUN-18
Diethylphthalate			<0.10		ug/g		0.1	12-JUN-18
Dimethylphthalate			<0.10		ug/g		0.1	12-JUN-18
Fluoranthene			<0.050		ug/g		0.05	12-JUN-18
Fluorene			<0.050		ug/g		0.05	12-JUN-18
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	12-JUN-18
Naphthalene			<0.050		ug/g		0.05	12-JUN-18
Pentachlorophenol			<0.10		ug/g		0.1	12-JUN-18
Phenanthrene			<0.050		ug/g		0.05	12-JUN-18
Phenol			<0.10		ug/g		0.1	12-JUN-18
Pyrene			<0.050		ug/g		0.05	12-JUN-18
Surrogate: 2-Fluorobiphenyl			66.9		%		50-140	12-JUN-18
Surrogate: 2,4,6-Tribromophenol			56.1		%		50-140	12-JUN-18
Surrogate: Nitrobenzene d5			86.1		%		50-140	12-JUN-18
Surrogate: p-Terphenyl d14			110.8		%		50-140	12-JUN-18
Surrogate: Phenol d5			92.4		%		30-130	12-JUN-18
WG2792266-5 MS		**WG2792266-3**						
1-Methylnaphthalene			95.3		%		50-140	12-JUN-18
1,2,4-Trichlorobenzene			93.7		%		50-140	12-JUN-18
2-Chlorophenol			96.5		%		50-140	12-JUN-18
2-Methylnaphthalene			95.9		%		50-140	12-JUN-18
2,4-Dichlorophenol			100.4		%		50-140	12-JUN-18
2,4-Dimethylphenol			117.8		%		30-150	12-JUN-18
2,4-Dinitrophenol			104.7		%		30-150	12-JUN-18
2,4-Dinitrotoluene			91.7		%		50-140	12-JUN-18
2,4,5-Trichlorophenol			102.2		%		50-140	12-JUN-18
2,4,6-Trichlorophenol			103.0		%		50-140	12-JUN-18
2,6-Dinitrotoluene			92.5		%		50-140	12-JUN-18
3,3'-Dichlorobenzidine			81.6		%		30-130	12-JUN-18
4-Chloroaniline			84.4		%		30-130	12-JUN-18
Acenaphthene			91.0		%		50-140	12-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Soil**							
Batch R4081248								
WG2792266-5 MS		**WG2792266-3**						
Acenaphthylene			90.6		%		50-140	12-JUN-18
Anthracene			88.4		%		50-140	12-JUN-18
Benzo(a)anthracene			96.4		%		50-140	12-JUN-18
Benzo(a)pyrene			98.8		%		50-140	12-JUN-18
Benzo(b)fluoranthene			107.2		%		50-140	12-JUN-18
Benzo(ghi)perylene			85.8		%		50-140	12-JUN-18
Benzo(k)fluoranthene			95.0		%		50-140	12-JUN-18
Biphenyl			99.4		%		50-140	12-JUN-18
Bis(2-chloroethyl)ether			91.4		%		50-140	12-JUN-18
Bis(2-chloroisopropyl)ether			91.8		%		50-140	12-JUN-18
Bis(2-ethylhexyl)phthalate			91.8		%		50-140	12-JUN-18
Chrysene			103.9		%		50-140	12-JUN-18
Dibenzo(a,h)anthracene			83.5		%		50-140	12-JUN-18
Diethylphthalate			95.9		%		50-140	12-JUN-18
Dimethylphthalate			97.9		%		50-140	12-JUN-18
Fluoranthene			90.1		%		50-140	12-JUN-18
Fluorene			92.1		%		50-140	12-JUN-18
Indeno(1,2,3-cd)pyrene			87.2		%		50-140	12-JUN-18
Naphthalene			91.0		%		50-140	12-JUN-18
Pentachlorophenol			107.6		%		50-140	12-JUN-18
Phenanthrene			91.9		%		50-140	12-JUN-18
Phenol			102.2		%		30-130	12-JUN-18
Pyrene			90.1		%		50-140	12-JUN-18
B-HWS-R511-WT	**Soil**							
Batch R4075761								
WG2791424-4 DUP		**L2100878-1**						
Boron (B), Hot Water Ext.		<0.10	<0.10	RPD-NA	ug/g	N/A	30	07-JUN-18
WG2791424-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			105.3		%		70-130	07-JUN-18
WG2791424-3 LCS								
Boron (B), Hot Water Ext.			106.3		%		70-130	07-JUN-18
WG2791424-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	07-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT	**Soil**							
Batch R4076044								
WG2791782-4 DUP		**L2105662-6**						
Boron (B), Hot Water Ext.		0.20	0.19		ug/g	2.9	30	08-JUN-18
WG2791782-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			108.0		%		70-130	08-JUN-18
WG2791782-3 LCS								
Boron (B), Hot Water Ext.			108.3		%		70-130	08-JUN-18
WG2791782-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	08-JUN-18
CN-WAD-R511-WT	**Soil**							
Batch R4078048								
WG2791101-3 DUP		**L2105552-1**						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	08-JUN-18
WG2791101-2 LCS								
Cyanide, Weak Acid Diss			92.2		%		80-120	08-JUN-18
WG2791101-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	08-JUN-18
WG2791101-4 MS		**L2105552-1**						
Cyanide, Weak Acid Diss			97.2		%		70-130	08-JUN-18
CR-CR6-IC-WT	**Soil**							
Batch R4078441								
WG2792368-3 CRM		**WT-SQC012**						
Chromium, Hexavalent			92.8		%		70-130	11-JUN-18
WG2792368-4 DUP		**L2105012-2**						
Chromium, Hexavalent		0.29	<0.20	RPD-NA	ug/g	N/A	35	11-JUN-18
WG2792368-2 LCS								
Chromium, Hexavalent			99.0		%		80-120	11-JUN-18
WG2792368-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	11-JUN-18
EC-WT	**Soil**							
Batch R4076428								
WG2791786-4 DUP		**WG2791786-3**						
Conductivity		0.675	0.670		mS/cm	0.7	20	08-JUN-18
WG2791976-1 LCS								
Conductivity			98.4		%		90-110	08-JUN-18
WG2791786-1 MB								
Conductivity			<0.0040		mS/cm		0.004	08-JUN-18
F1-HS-511-WT	**Soil**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	**Soil**							
Batch R4069217								
WG2787662-4 DUP		**WG2787662-3**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	05-JUN-18
WG2787662-2 LCS								
F1 (C6-C10)			106.9		%		80-120	05-JUN-18
WG2787662-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	05-JUN-18
Surrogate: 3,4-Dichlorotoluene			111.1		%		60-140	05-JUN-18
WG2787662-6 MS		**L2104927-1**						
F1 (C6-C10)			77.0		%		60-140	05-JUN-18
F2-F4-511-WT	**Soil**							
Batch R4076279								
WG2791173-3 DUP		**WG2791173-5**						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	08-JUN-18
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	08-JUN-18
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	08-JUN-18
WG2791173-2 LCS								
F2 (C10-C16)			105.2		%		80-120	08-JUN-18
F3 (C16-C34)			104.1		%		80-120	08-JUN-18
F4 (C34-C50)			106.8		%		80-120	08-JUN-18
WG2791173-1 MB								
F2 (C10-C16)			<10		ug/g		10	08-JUN-18
F3 (C16-C34)			<50		ug/g		50	08-JUN-18
F4 (C34-C50)			<50		ug/g		50	08-JUN-18
Surrogate: 2-Bromobenzotrifluoride			91.1		%		60-140	08-JUN-18
WG2791173-4 MS		**WG2791173-5**						
F2 (C10-C16)			107.4		%		60-140	08-JUN-18
F3 (C16-C34)			105.2		%		60-140	08-JUN-18
F4 (C34-C50)			109.6		%		60-140	08-JUN-18
F4G-ADD-511-WT	**Soil**							
Batch R4078948								
WG2794192-2 LCS								
F4G-SG (GHH-Silica)			81.3		%		60-140	07-JUN-18
WG2794192-1 MB								
F4G-SG (GHH-Silica)			<250		ug/g		250	07-JUN-18
HG-200.2-CVAA-WT	**Soil**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-200.2-CVAA-WT	**Soil**							
Batch R4075062								
WG2790526-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			119.7		%		70-130	07-JUN-18
WG2790526-6 DUP		**WG2790526-5**						
Mercury (Hg)		0.0398	0.0595		ug/g	40	40	07-JUN-18
WG2790526-3 LCS								
Mercury (Hg)			109.5		%		80-120	07-JUN-18
WG2790526-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	07-JUN-18
Batch R4076045								
WG2791355-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			99.0		%		70-130	08-JUN-18
WG2791355-6 DUP		**WG2791355-5**						
Mercury (Hg)		0.0090	0.0091		ug/g	1.6	40	08-JUN-18
WG2791355-3 LCS								
Mercury (Hg)			101.0		%		80-120	08-JUN-18
WG2791355-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	08-JUN-18
MET-200.2-CCMS-WT	**Soil**							
Batch R4075827								
WG2790526-2 CRM		**WT-CANMET-TILL1**						
Antimony (Sb)			104.4		%		70-130	07-JUN-18
Arsenic (As)			105.4		%		70-130	07-JUN-18
Barium (Ba)			112.9		%		70-130	07-JUN-18
Beryllium (Be)			104.5		%		70-130	07-JUN-18
Boron (B)			3.1		mg/kg		0-8.2	07-JUN-18
Cadmium (Cd)			96.9		%		70-130	07-JUN-18
Chromium (Cr)			104.0		%		70-130	07-JUN-18
Cobalt (Co)			104.9		%		70-130	07-JUN-18
Copper (Cu)			105.6		%		70-130	07-JUN-18
Lead (Pb)			93.1		%		70-130	07-JUN-18
Molybdenum (Mo)			102.9		%		70-130	07-JUN-18
Nickel (Ni)			102.7		%		70-130	07-JUN-18
Selenium (Se)			0.34		mg/kg		0.11-0.51	07-JUN-18
Silver (Ag)			0.23		mg/kg		0.13-0.33	07-JUN-18
Thallium (Tl)			0.116		mg/kg		0.077-0.18	07-JUN-18
Uranium (U)			92.1		%		70-130	07-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4075827								
WG2790526-2 CRM		**WT-CANMET-TILL1**						
Vanadium (V)			103.8		%		70-130	07-JUN-18
Zinc (Zn)			100.9		%		70-130	07-JUN-18
WG2790526-6 DUP		**WG2790526-5**						
Antimony (Sb)		0.63	0.73		ug/g	13	30	07-JUN-18
Arsenic (As)		2.39	2.25		ug/g	6.4	30	07-JUN-18
Barium (Ba)		30.8	29.0		ug/g	6.2	40	07-JUN-18
Beryllium (Be)		0.25	0.25		ug/g	0.7	30	07-JUN-18
Boron (B)		5.3	<5.0	RPD-NA	ug/g	N/A	30	07-JUN-18
Cadmium (Cd)		0.273	0.260		ug/g	5.0	30	07-JUN-18
Chromium (Cr)		10.4	9.98		ug/g	3.6	30	07-JUN-18
Cobalt (Co)		3.35	3.20		ug/g	4.5	30	07-JUN-18
Copper (Cu)		13.0	12.1		ug/g	7.6	30	07-JUN-18
Lead (Pb)		28.8	29.5		ug/g	2.5	40	07-JUN-18
Molybdenum (Mo)		0.34	0.32		ug/g	3.7	40	07-JUN-18
Nickel (Ni)		7.92	7.13		ug/g	10	30	07-JUN-18
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	07-JUN-18
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	07-JUN-18
Thallium (Tl)		0.060	0.057		ug/g	4.9	30	07-JUN-18
Uranium (U)		0.458	0.415		ug/g	9.9	30	07-JUN-18
Vanadium (V)		24.2	21.7		ug/g	11	30	07-JUN-18
Zinc (Zn)		67.9	60.0		ug/g	12	30	07-JUN-18
WG2790526-4 LCS								
Antimony (Sb)			109.6		%		80-120	07-JUN-18
Arsenic (As)			112.6		%		80-120	07-JUN-18
Barium (Ba)			112.4		%		80-120	07-JUN-18
Beryllium (Be)			111.4		%		80-120	07-JUN-18
Boron (B)			113.7		%		80-120	07-JUN-18
Cadmium (Cd)			103.6		%		80-120	07-JUN-18
Chromium (Cr)			112.0		%		80-120	07-JUN-18
Cobalt (Co)			108.5		%		80-120	07-JUN-18
Copper (Cu)			107.4		%		80-120	07-JUN-18
Lead (Pb)			107.0		%		80-120	07-JUN-18
Molybdenum (Mo)			106.6		%		80-120	07-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4075827								
WG2790526-4 LCS								
Nickel (Ni)			108.4		%		80-120	07-JUN-18
Selenium (Se)			110.4		%		80-120	07-JUN-18
Silver (Ag)			102.4		%		80-120	07-JUN-18
Thallium (Tl)			107.1		%		80-120	07-JUN-18
Uranium (U)			100.2		%		80-120	07-JUN-18
Vanadium (V)			113.6		%		80-120	07-JUN-18
Zinc (Zn)			102.9		%		80-120	07-JUN-18
WG2790526-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	07-JUN-18
Arsenic (As)			<0.10		mg/kg		0.1	07-JUN-18
Barium (Ba)			<0.50		mg/kg		0.5	07-JUN-18
Beryllium (Be)			<0.10		mg/kg		0.1	07-JUN-18
Boron (B)			<5.0		mg/kg		5	07-JUN-18
Cadmium (Cd)			<0.020		mg/kg		0.02	07-JUN-18
Chromium (Cr)			<0.50		mg/kg		0.5	07-JUN-18
Cobalt (Co)			<0.10		mg/kg		0.1	07-JUN-18
Copper (Cu)			<0.50		mg/kg		0.5	07-JUN-18
Lead (Pb)			<0.50		mg/kg		0.5	07-JUN-18
Molybdenum (Mo)			<0.10		mg/kg		0.1	07-JUN-18
Nickel (Ni)			<0.50		mg/kg		0.5	07-JUN-18
Selenium (Se)			<0.20		mg/kg		0.2	07-JUN-18
Silver (Ag)			<0.10		mg/kg		0.1	07-JUN-18
Thallium (Tl)			<0.050		mg/kg		0.05	07-JUN-18
Uranium (U)			<0.050		mg/kg		0.05	07-JUN-18
Vanadium (V)			<0.20		mg/kg		0.2	07-JUN-18
Zinc (Zn)			<2.0		mg/kg		2	07-JUN-18
Batch R4076202								
WG2791355-2 CRM		**WT-CANMET-TILL1**						
Antimony (Sb)			101.7		%		70-130	08-JUN-18
Arsenic (As)			103.8		%		70-130	08-JUN-18
Barium (Ba)			111.5		%		70-130	08-JUN-18
Beryllium (Be)			102.7		%		70-130	08-JUN-18
Boron (B)			3.4		mg/kg		0-8.2	08-JUN-18
Cadmium (Cd)			102.9		%		70-130	08-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4076202								
WG2791355-2 CRM		**WT-CANMET-TILL1**						
Chromium (Cr)			100.2		%		70-130	08-JUN-18
Cobalt (Co)			104.5		%		70-130	08-JUN-18
Copper (Cu)			105.2		%		70-130	08-JUN-18
Lead (Pb)			92.7		%		70-130	08-JUN-18
Molybdenum (Mo)			105.8		%		70-130	08-JUN-18
Nickel (Ni)			103.7		%		70-130	08-JUN-18
Selenium (Se)			0.32		mg/kg		0.11-0.51	08-JUN-18
Silver (Ag)			0.22		mg/kg		0.13-0.33	08-JUN-18
Thallium (Tl)			0.105		mg/kg		0.077-0.18	08-JUN-18
Uranium (U)			87.6		%		70-130	08-JUN-18
Vanadium (V)			102.9		%		70-130	08-JUN-18
Zinc (Zn)			97.3		%		70-130	08-JUN-18
WG2791355-6 DUP		**WG2791355-5**						
Antimony (Sb)		<0.10	<0.10	RPD-NA	ug/g	N/A	30	08-JUN-18
Arsenic (As)		1.43	1.34		ug/g	6.4	30	08-JUN-18
Barium (Ba)		23.8	21.6		ug/g	9.6	40	08-JUN-18
Beryllium (Be)		0.19	0.18		ug/g	3.6	30	08-JUN-18
Boron (B)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	08-JUN-18
Cadmium (Cd)		0.037	0.036		ug/g	2.0	30	08-JUN-18
Chromium (Cr)		7.42	6.69		ug/g	10	30	08-JUN-18
Cobalt (Co)		3.31	3.03		ug/g	9.0	30	08-JUN-18
Copper (Cu)		5.50	5.04		ug/g	8.7	30	08-JUN-18
Lead (Pb)		4.89	4.71		ug/g	3.8	40	08-JUN-18
Molybdenum (Mo)		0.26	0.24		ug/g	9.3	40	08-JUN-18
Nickel (Ni)		7.07	6.53		ug/g	7.9	30	08-JUN-18
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	08-JUN-18
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	08-JUN-18
Thallium (Tl)		<0.050	<0.050	RPD-NA	ug/g	N/A	30	08-JUN-18
Uranium (U)		0.300	0.308		ug/g	2.8	30	08-JUN-18
Vanadium (V)		10.3	10.3		ug/g	0.4	30	08-JUN-18
Zinc (Zn)		19.7	18.9		ug/g	4.2	30	08-JUN-18
WG2791355-4 LCS								
Antimony (Sb)			100.5		%		80-120	08-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4076202								
WG2791355-4 LCS								
Arsenic (As)			96.4		%		80-120	08-JUN-18
Barium (Ba)			96.9		%		80-120	08-JUN-18
Beryllium (Be)			99.8		%		80-120	08-JUN-18
Boron (B)			101.1		%		80-120	08-JUN-18
Cadmium (Cd)			96.4		%		80-120	08-JUN-18
Chromium (Cr)			97.0		%		80-120	08-JUN-18
Cobalt (Co)			96.0		%		80-120	08-JUN-18
Copper (Cu)			96.2		%		80-120	08-JUN-18
Lead (Pb)			96.5		%		80-120	08-JUN-18
Molybdenum (Mo)			99.96		%		80-120	08-JUN-18
Nickel (Ni)			95.9		%		80-120	08-JUN-18
Selenium (Se)			98.2		%		80-120	08-JUN-18
Silver (Ag)			89.7		%		80-120	08-JUN-18
Thallium (Tl)			95.2		%		80-120	08-JUN-18
Uranium (U)			91.1		%		80-120	08-JUN-18
Vanadium (V)			100.8		%		80-120	08-JUN-18
Zinc (Zn)			89.4		%		80-120	08-JUN-18
WG2791355-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	08-JUN-18
Arsenic (As)			<0.10		mg/kg		0.1	08-JUN-18
Barium (Ba)			<0.50		mg/kg		0.5	08-JUN-18
Beryllium (Be)			<0.10		mg/kg		0.1	08-JUN-18
Boron (B)			<5.0		mg/kg		5	08-JUN-18
Cadmium (Cd)			<0.020		mg/kg		0.02	08-JUN-18
Chromium (Cr)			<0.50		mg/kg		0.5	08-JUN-18
Cobalt (Co)			<0.10		mg/kg		0.1	08-JUN-18
Copper (Cu)			<0.50		mg/kg		0.5	08-JUN-18
Lead (Pb)			<0.50		mg/kg		0.5	08-JUN-18
Molybdenum (Mo)			<0.10		mg/kg		0.1	08-JUN-18
Nickel (Ni)			<0.50		mg/kg		0.5	08-JUN-18
Selenium (Se)			<0.20		mg/kg		0.2	08-JUN-18
Silver (Ag)			<0.10		mg/kg		0.1	08-JUN-18
Thallium (Tl)			<0.050		mg/kg		0.05	08-JUN-18
Uranium (U)			<0.050		mg/kg		0.05	08-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R4076202								
WG2791355-1 MB								
Vanadium (V)			<0.20		mg/kg		0.2	08-JUN-18
Zinc (Zn)			<2.0		mg/kg		2	08-JUN-18
MOISTURE-WT	**Soil**							
Batch R4076824								
WG2792290-3 DUP		**L2105977-3**						
% Moisture		7.98	7.76		%	2.8	20	09-JUN-18
WG2792290-2 LCS								
% Moisture			99.3		%		90-110	09-JUN-18
WG2792290-1 MB								
% Moisture			<0.10		%		0.1	09-JUN-18
PCB-511-WT	**Soil**							
Batch R4077931								
WG2792156-3 DUP		**WG2792156-5**						
Aroclor 1242		<0.010	<0.010	RPD-NA	ug/g	N/A	40	11-JUN-18
Aroclor 1248		<0.010	<0.010	RPD-NA	ug/g	N/A	40	11-JUN-18
Aroclor 1254		<0.010	<0.010	RPD-NA	ug/g	N/A	40	11-JUN-18
Aroclor 1260		<0.010	<0.010	RPD-NA	ug/g	N/A	40	11-JUN-18
WG2792156-2 LCS								
Aroclor 1242			94.3		%		60-140	11-JUN-18
Aroclor 1248			97.7		%		60-140	11-JUN-18
Aroclor 1254			103.8		%		60-140	11-JUN-18
Aroclor 1260			109.7		%		60-140	11-JUN-18
WG2792156-1 MB								
Aroclor 1242			<0.010		ug/g		0.01	11-JUN-18
Aroclor 1248			<0.010		ug/g		0.01	11-JUN-18
Aroclor 1254			<0.010		ug/g		0.01	11-JUN-18
Aroclor 1260			<0.010		ug/g		0.01	11-JUN-18
Surrogate: d14-Terphenyl			99.6		%		60-140	11-JUN-18
WG2792156-4 MS		**WG2792156-5**						
Aroclor 1242			90.8		%		60-140	11-JUN-18
Aroclor 1254			103.9		%		60-140	11-JUN-18
Aroclor 1260			112.3		%		60-140	11-JUN-18
PH-WT	**Soil**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT	**Soil**							
Batch R4076192								
WG2791233-1 DUP		**L2105170-2**						
pH		8.31	8.38	J	pH units	0.07	0.3	08-JUN-18
WG2791962-1 LCS								
pH			6.99		pH units		6.9-7.1	08-JUN-18
SAR-R511-WT	**Soil**							
Batch R4076234								
WG2791786-4 DUP		**WG2791786-3**						
Calcium (Ca)		11.0	10.5		mg/L	5.0	30	08-JUN-18
Sodium (Na)		118	119		mg/L	1.2	30	08-JUN-18
Magnesium (Mg)		13.4	13.6		mg/L	1.5	30	08-JUN-18
WG2791786-2 IRM		**WT SAR2**						
Calcium (Ca)			106.7		%		70-130	08-JUN-18
Sodium (Na)			98.4		%		70-130	08-JUN-18
Magnesium (Mg)			105.1		%		70-130	08-JUN-18
WG2791786-1 MB								
Calcium (Ca)			<1.0		mg/L		1	08-JUN-18
Sodium (Na)			<1.0		mg/L		1	08-JUN-18
Magnesium (Mg)			<1.0		mg/L		1	08-JUN-18
VOC-511-HS-WT	**Soil**							
Batch R4069217								
WG2787662-4 DUP		**WG2787662-3**						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	05-JUN-18
Benzene		0.0128	0.0125		ug/g	2.4	40	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4069217								
WG2787662-4 DUP		**WG2787662-3**						
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	05-JUN-18
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	05-JUN-18
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
m+p-Xylenes		0.118	0.115		ug/g	2.6	40	05-JUN-18
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	05-JUN-18
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	05-JUN-18
o-Xylene		0.054	0.052		ug/g	3.4	40	05-JUN-18
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	05-JUN-18
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	05-JUN-18
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	05-JUN-18
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	05-JUN-18
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	05-JUN-18
WG2787662-2 LCS								
1,1,1,2-Tetrachloroethane			103.0		%		60-130	05-JUN-18
1,1,2,2-Tetrachloroethane			111.8		%		60-130	05-JUN-18
1,1,1-Trichloroethane			101.6		%		60-130	05-JUN-18
1,1,2-Trichloroethane			113.0		%		60-130	05-JUN-18
1,1-Dichloroethane			102.1		%		60-130	05-JUN-18
1,1-Dichloroethylene			93.7		%		60-130	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4069217								
WG2787662-2 LCS								
1,2-Dibromoethane			113.2		%		70-130	05-JUN-18
1,2-Dichlorobenzene			107.5		%		70-130	05-JUN-18
1,2-Dichloroethane			116.7		%		60-130	05-JUN-18
1,2-Dichloropropane			109.8		%		70-130	05-JUN-18
1,3-Dichlorobenzene			104.3		%		70-130	05-JUN-18
1,4-Dichlorobenzene			106.4		%		70-130	05-JUN-18
Acetone			125.8		%		60-140	05-JUN-18
Benzene			108.5		%		70-130	05-JUN-18
Bromodichloromethane			106.3		%		50-140	05-JUN-18
Bromoform			102.2		%		70-130	05-JUN-18
Bromomethane			103.2		%		50-140	05-JUN-18
Carbon tetrachloride			98.4		%		70-130	05-JUN-18
Chlorobenzene			106.7		%		70-130	05-JUN-18
Chloroform			107.7		%		70-130	05-JUN-18
cis-1,2-Dichloroethylene			109.5		%		70-130	05-JUN-18
cis-1,3-Dichloropropene			113.0		%		70-130	05-JUN-18
Dibromochloromethane			108.5		%		60-130	05-JUN-18
Dichlorodifluoromethane			74.2		%		50-140	05-JUN-18
Ethylbenzene			103.6		%		70-130	05-JUN-18
n-Hexane			102.5		%		70-130	05-JUN-18
Methylene Chloride			110.2		%		70-130	05-JUN-18
MTBE			107.1		%		70-130	05-JUN-18
m+p-Xylenes			104.4		%		70-130	05-JUN-18
Methyl Ethyl Ketone			122.8		%		60-140	05-JUN-18
Methyl Isobutyl Ketone			119.4		%		60-140	05-JUN-18
o-Xylene			104.1		%		70-130	05-JUN-18
Styrene			105.2		%		70-130	05-JUN-18
Tetrachloroethylene			101.9		%		60-130	05-JUN-18
Toluene			105.7		%		70-130	05-JUN-18
trans-1,2-Dichloroethylene			104.9		%		60-130	05-JUN-18
trans-1,3-Dichloropropene			110.7		%		70-130	05-JUN-18
Trichloroethylene			106.6		%		60-130	05-JUN-18
Trichlorofluoromethane			99.7		%		50-140	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4069217								
WG2787662-2 LCS								
Vinyl chloride			93.2		%		60-140	05-JUN-18
WG2787662-1 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	05-JUN-18
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	05-JUN-18
1,1,1-Trichloroethane			<0.050		ug/g		0.05	05-JUN-18
1,1,2-Trichloroethane			<0.050		ug/g		0.05	05-JUN-18
1,1-Dichloroethane			<0.050		ug/g		0.05	05-JUN-18
1,1-Dichloroethylene			<0.050		ug/g		0.05	05-JUN-18
1,2-Dibromoethane			<0.050		ug/g		0.05	05-JUN-18
1,2-Dichlorobenzene			<0.050		ug/g		0.05	05-JUN-18
1,2-Dichloroethane			<0.050		ug/g		0.05	05-JUN-18
1,2-Dichloropropane			<0.050		ug/g		0.05	05-JUN-18
1,3-Dichlorobenzene			<0.050		ug/g		0.05	05-JUN-18
1,4-Dichlorobenzene			<0.050		ug/g		0.05	05-JUN-18
Acetone			<0.50		ug/g		0.5	05-JUN-18
Benzene			<0.0068		ug/g		0.0068	05-JUN-18
Bromodichloromethane			<0.050		ug/g		0.05	05-JUN-18
Bromoform			<0.050		ug/g		0.05	05-JUN-18
Bromomethane			<0.050		ug/g		0.05	05-JUN-18
Carbon tetrachloride			<0.050		ug/g		0.05	05-JUN-18
Chlorobenzene			<0.050		ug/g		0.05	05-JUN-18
Chloroform			<0.050		ug/g		0.05	05-JUN-18
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	05-JUN-18
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	05-JUN-18
Dibromochloromethane			<0.050		ug/g		0.05	05-JUN-18
Dichlorodifluoromethane			<0.050		ug/g		0.05	05-JUN-18
Ethylbenzene			<0.018		ug/g		0.018	05-JUN-18
n-Hexane			<0.050		ug/g		0.05	05-JUN-18
Methylene Chloride			<0.050		ug/g		0.05	05-JUN-18
MTBE			<0.050		ug/g		0.05	05-JUN-18
m+p-Xylenes			<0.030		ug/g		0.03	05-JUN-18
Methyl Ethyl Ketone			<0.50		ug/g		0.5	05-JUN-18
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	05-JUN-18
o-Xylene			<0.020		ug/g		0.02	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4069217								
WG2787662-1 MB								
Styrene			<0.050		ug/g		0.05	05-JUN-18
Tetrachloroethylene			<0.050		ug/g		0.05	05-JUN-18
Toluene			<0.080		ug/g		0.08	05-JUN-18
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	05-JUN-18
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	05-JUN-18
Trichloroethylene			<0.010		ug/g		0.01	05-JUN-18
Trichlorofluoromethane			<0.050		ug/g		0.05	05-JUN-18
Vinyl chloride			<0.020		ug/g		0.02	05-JUN-18
Surrogate: 1,4-Difluorobenzene			104.5		%		50-140	05-JUN-18
Surrogate: 4-Bromofluorobenzene			102.7		%		50-140	05-JUN-18
WG2787662-5 MS		**L2104880-1**						
1,1,1,2-Tetrachloroethane			103.7		%		50-140	05-JUN-18
1,1,2,2-Tetrachloroethane			102.4		%		50-140	05-JUN-18
1,1,1-Trichloroethane			102.4		%		50-140	05-JUN-18
1,1,2-Trichloroethane			114.3		%		50-140	05-JUN-18
1,1-Dichloroethane			102.8		%		50-140	05-JUN-18
1,1-Dichloroethylene			95.3		%		50-140	05-JUN-18
1,2-Dibromoethane			113.8		%		50-140	05-JUN-18
1,2-Dichlorobenzene			105.7		%		50-140	05-JUN-18
1,2-Dichloroethane			116.2		%		50-140	05-JUN-18
1,2-Dichloropropane			110.0		%		50-140	05-JUN-18
1,3-Dichlorobenzene			101.3		%		50-140	05-JUN-18
1,4-Dichlorobenzene			103.9		%		50-140	05-JUN-18
Acetone			126.6		%		50-140	05-JUN-18
Benzene			109.1		%		50-140	05-JUN-18
Bromodichloromethane			105.8		%		50-140	05-JUN-18
Bromoform			100.9		%		50-140	05-JUN-18
Bromomethane			94.9		%		50-140	05-JUN-18
Carbon tetrachloride			99.3		%		50-140	05-JUN-18
Chlorobenzene			106.8		%		50-140	05-JUN-18
Chloroform			107.9		%		50-140	05-JUN-18
cis-1,2-Dichloroethylene			110.1		%		50-140	05-JUN-18
cis-1,3-Dichloropropene			108.1		%		50-140	05-JUN-18
Dibromochloromethane			109.0		%		50-140	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R4069217								
WG2787662-5 MS		**L2104880-1**						
Dichlorodifluoromethane			77.5		%		50-140	05-JUN-18
Ethylbenzene			104.1		%		50-140	05-JUN-18
n-Hexane			106.9		%		50-140	05-JUN-18
Methylene Chloride			110.8		%		50-140	05-JUN-18
MTBE			107.9		%		50-140	05-JUN-18
m+p-Xylenes			104.2		%		50-140	05-JUN-18
Methyl Ethyl Ketone			121.0		%		50-140	05-JUN-18
Methyl Isobutyl Ketone			111.4		%		50-140	05-JUN-18
o-Xylene			104.4		%		50-140	05-JUN-18
Styrene			101.8		%		50-140	05-JUN-18
Tetrachloroethylene			101.7		%		50-140	05-JUN-18
Toluene			106.4		%		50-140	05-JUN-18
trans-1,2-Dichloroethylene			105.2		%		50-140	05-JUN-18
trans-1,3-Dichloropropene			107.1		%		50-140	05-JUN-18
Trichloroethylene			112.2		%		50-140	05-JUN-18
Trichlorofluoromethane			103.5		%		50-140	05-JUN-18
Vinyl chloride			96.5		%		50-140	05-JUN-18

Quality Control Report

Workorder: L2105012 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY DRIVE
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

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.

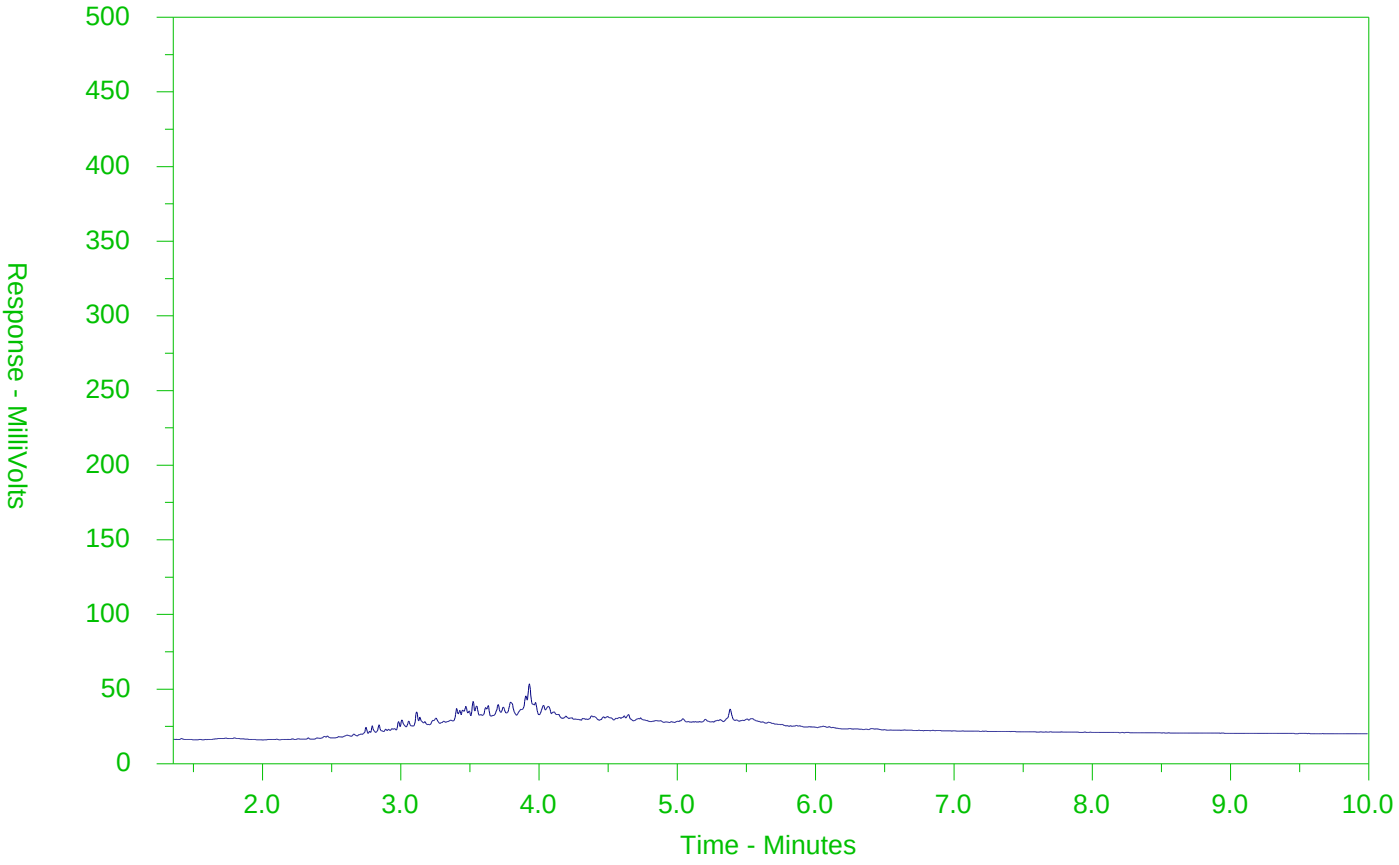
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2105012-1
Client Sample ID: S-11149990-053018-TW-22



←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.

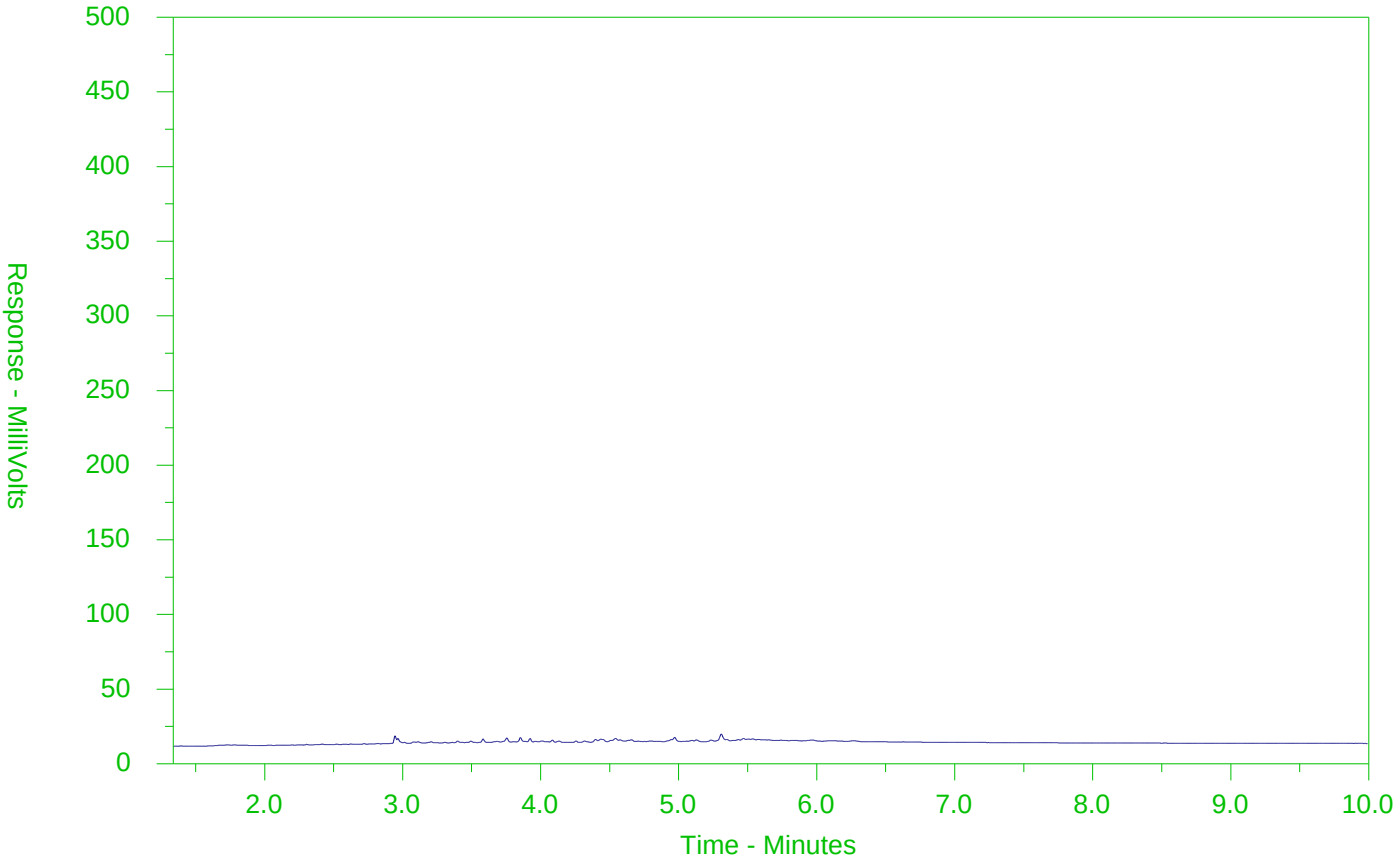
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2105012-2
Client Sample ID: S-11149990-053018-TW-23



←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.

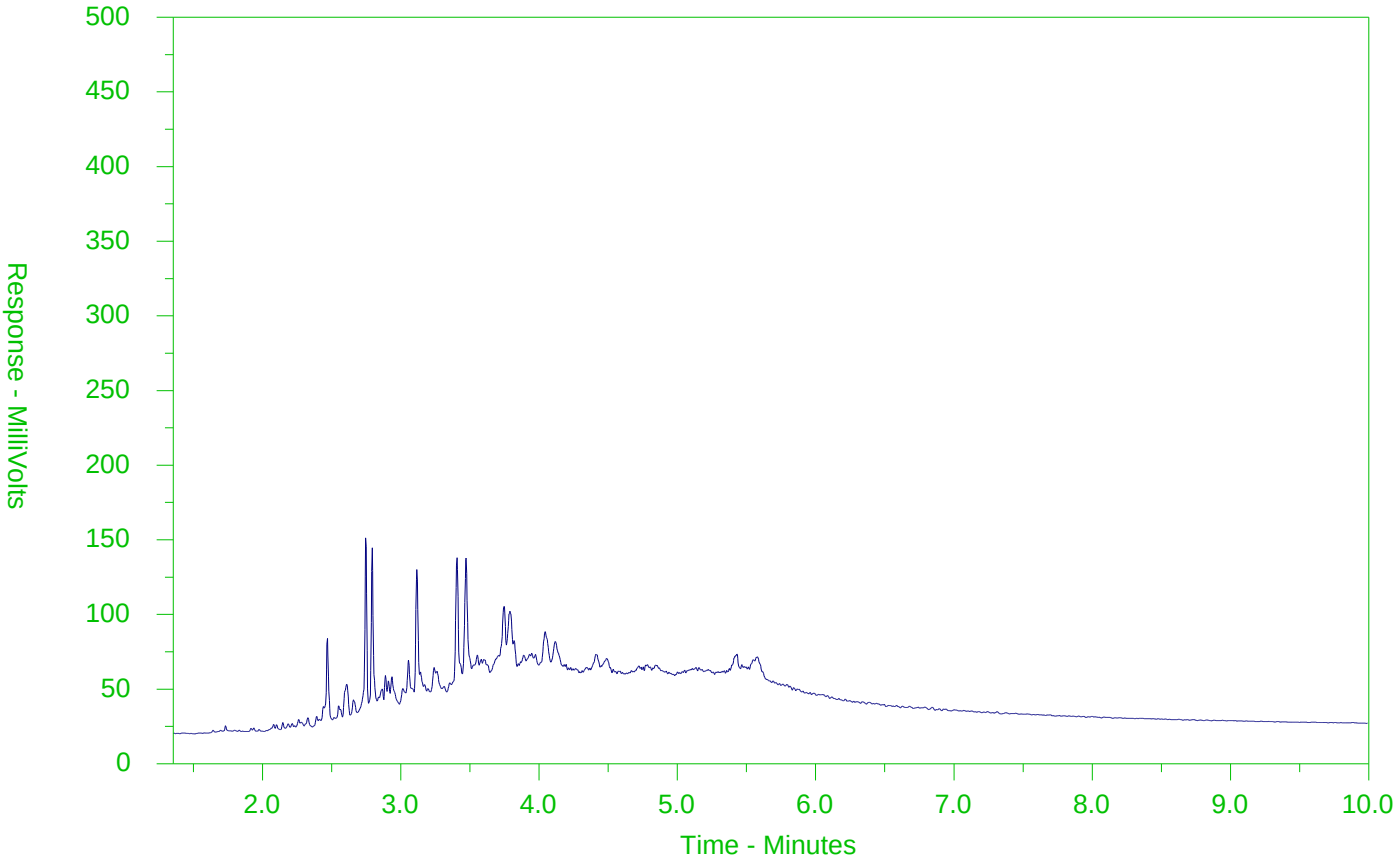
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2105012-3
Client Sample ID: S-11149990-053018-TW-24



←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.

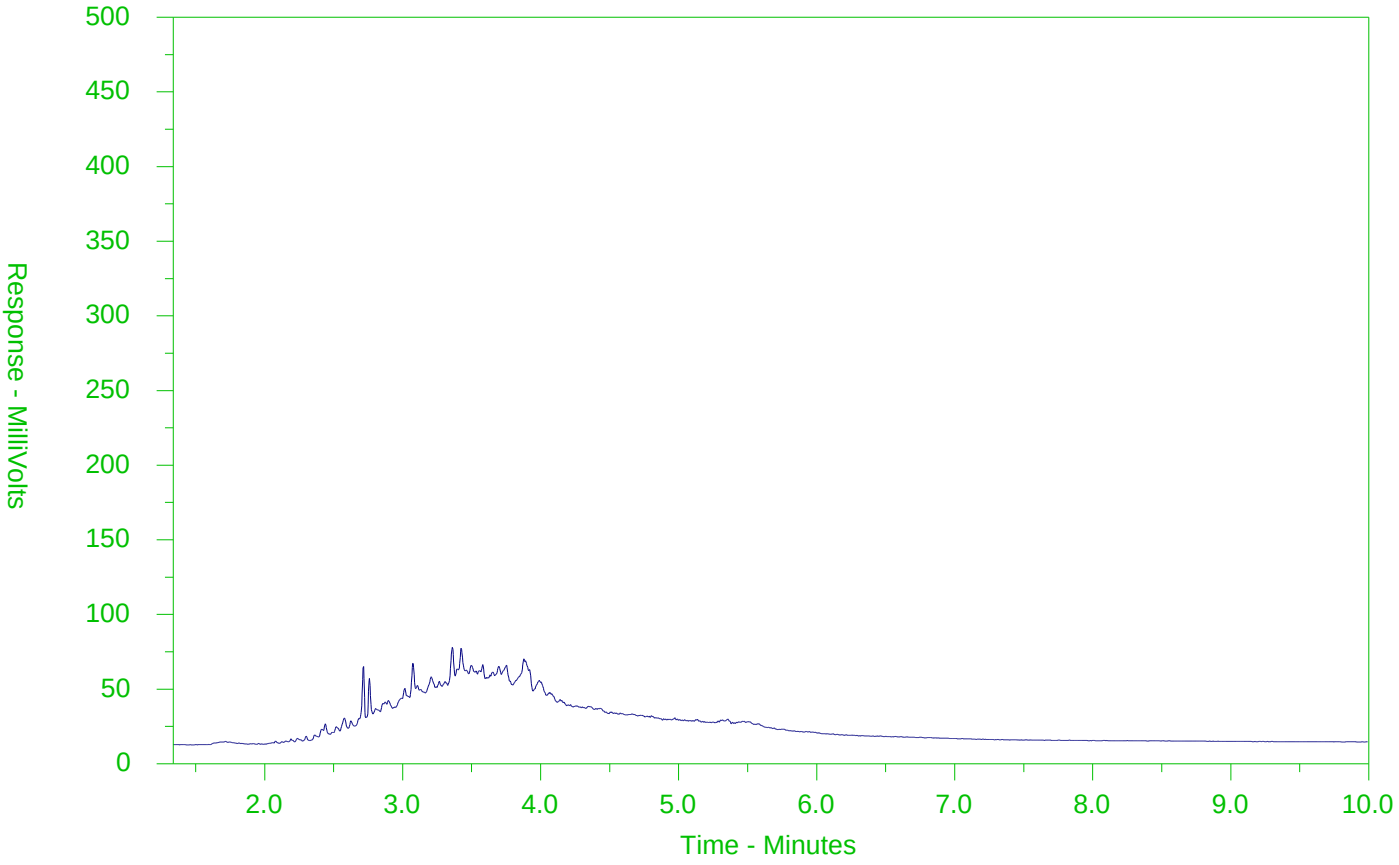
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2105012-4
Client Sample ID: S-11149990-053018-TW-25



←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

L2105012-COFC

COC Number: 17 - 622302

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	GHD Limited Acct A13791
Contact:	Jennifer Balkwill
Phone:	519-884-0510
	Company address below will appear on the final report
Street:	651 Colby Drive
City/Province:	Waterloo, Ontario
Postal Code:	N2V 1C2
Invoice To	Same as Report To [x] YES [ ] NO
	Copy of Invoice with Report [ ] YES [x] NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	[x] PDF [x] EXCEL [x] EDD (DIGITAL)
Quality Control (QC) Report with Report	[x] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	[x] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	Jennifer.Balkwill@ghd.com
Email 2	See PO
Email 3	
Invoice Distribution	
Select Invoice Distribution:	[x] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	Jennifer.Balkwill@ghd.com
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%] [ ]	EMERGENCY: 1 Business day [E-100%] [ ]
3 day [P3-25%] [ ]	Same Day, Weekend or Statutory holiday [E2-200% (Laboratory opening fees may apply)] [ ]
2 day [P2-50%] [ ]	
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 #:	11149990-04	Major/Minor Code:	Routing Code:
PO / AFE:	73511036-2	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	L2105012 RK O2A	ALS Contact: Rich H	Sampler: Tyler W

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	VOCs, F1-F4	SVOCs	153 Mand I pkg	PCBs	VOC, F1 (Trip Blank)	SAMPLES ON HOLD	Sample is hazardous (please provide further details)	NUMBER OF CONTAINERS
	S-11149990-053018-TW-22	30-May-18	9:20	S	X	X	X	X				4
	↓ -23	↓	12:30	↓	↓	↓	↓	↓				4
	↓ -24	↓	14:00	↓	↓	↓	↓	↓				4
	↓ -25	↓	14:15	↓	↓	↓	↓	↓				4
	TB-11149990-053018-TW-02	↓	—	—					X			1

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 [x] NO	
Are samples for human consumption/ use? [ ] YES [x] 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	5.9

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: [signature]	Date: 1-June-2018	Time: 19:05	Received by:	Date:	Time:	Received by: RameelC	Date: June 01	Time: 17:05

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — 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 sp... 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.

JULY 2017 FRONT

GHD Limited (Waterloo)
ATTN: JENNIFER BALKWILL
651 COLBY STREET
WATERLOO ON N2V 1C2

Date Received: 01-JUN-18
Report Date: 26-JUL-18 12:03 (MT)
Version: FINAL REV. 3

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2105017

Project P.O. #: 73511036-1
Job Reference: 11149990-04
C of C Numbers: 17-621916
Legal Site Desc:

Comments: Report #1

Rick Hawthorne
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105017-1 GW-11149990-060118-TW-002 Sampled By: TYLER W on 01-JUN-18 @ 13:10 Matrix: WATER							
Physical Tests							
Conductivity	3.29		0.0030	mS/cm		05-JUN-18	R4071849
pH	7.53		0.10	pH units		07-JUN-18	R4075090
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		08-JUN-18	R4078221
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					05-JUN-18	R4069151
Dissolved Metals Filtration Location	FIELD					04-JUN-18	R4066051
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Arsenic (As)-Dissolved	3.1	DLHC	1.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Barium (Ba)-Dissolved	323	DLHC	1.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Boron (B)-Dissolved	220	DLHC	100	ug/L	04-JUN-18	05-JUN-18	R4071168
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	04-JUN-18	05-JUN-18	R4071168
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Cobalt (Co)-Dissolved	6.5	DLHC	1.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	04-JUN-18	05-JUN-18	R4071168
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	05-JUN-18	05-JUN-18	R4069634
Molybdenum (Mo)-Dissolved	1.70	DLHC	0.50	ug/L	04-JUN-18	05-JUN-18	R4071168
Nickel (Ni)-Dissolved	18.4	DLHC	5.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Selenium (Se)-Dissolved	6.85	DLHC	0.50	ug/L	04-JUN-18	05-JUN-18	R4071168
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	04-JUN-18	05-JUN-18	R4071168
Sodium (Na)-Dissolved	482000	DLHC	500	ug/L	04-JUN-18	05-JUN-18	R4071168
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	04-JUN-18	05-JUN-18	R4071168
Uranium (U)-Dissolved	0.63	DLHC	0.10	ug/L	04-JUN-18	05-JUN-18	R4071168
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	04-JUN-18	05-JUN-18	R4071168
Zinc (Zn)-Dissolved	19	DLHC	10	ug/L	04-JUN-18	05-JUN-18	R4071168
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L		04-JUN-18	R4068987
Volatile Organic Compounds							
Acetone	<30		30	ug/L		05-JUN-18	R4068789
Benzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Bromodichloromethane	<2.0		2.0	ug/L		05-JUN-18	R4068789
Bromoform	<5.0		5.0	ug/L		05-JUN-18	R4068789
Bromomethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Carbon tetrachloride	<0.20		0.20	ug/L		05-JUN-18	R4068789
Chlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Dibromochloromethane	<2.0		2.0	ug/L		05-JUN-18	R4068789
Chloroform	<1.0		1.0	ug/L		05-JUN-18	R4068789
1,2-Dibromoethane	<0.20		0.20	ug/L		05-JUN-18	R4068789
1,2-Dichlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,3-Dichlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105017-1 GW-11149990-060118-TW-002 Sampled By: TYLER W on 01-JUN-18 @ 13:10 Matrix: WATER							
Volatile Organic Compounds							
1,4-Dichlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Dichlorodifluoromethane	<2.0		2.0	ug/L		05-JUN-18	R4068789
1,1-Dichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,2-Dichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1-Dichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Methylene Chloride	<5.0		5.0	ug/L		05-JUN-18	R4068789
1,2-Dichloropropane	<0.50		0.50	ug/L		05-JUN-18	R4068789
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		05-JUN-18	R4068789
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		05-JUN-18	R4068789
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		05-JUN-18	
Ethylbenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
n-Hexane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Methyl Ethyl Ketone	<20		20	ug/L		05-JUN-18	R4068789
Methyl Isobutyl Ketone	<20		20	ug/L		05-JUN-18	R4068789
MTBE	<2.0		2.0	ug/L		05-JUN-18	R4068789
Styrene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Tetrachloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Toluene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,1-Trichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,2-Trichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Trichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Trichlorofluoromethane	<5.0		5.0	ug/L		05-JUN-18	R4068789
Vinyl chloride	<0.50		0.50	ug/L		05-JUN-18	R4068789
o-Xylene	<0.30		0.30	ug/L		05-JUN-18	R4068789
m+p-Xylenes	<0.40		0.40	ug/L		05-JUN-18	R4068789
Xylenes (Total)	<0.50		0.50	ug/L		05-JUN-18	
Surrogate: 4-Bromofluorobenzene	103.3		70-130	%		05-JUN-18	R4068789
Surrogate: 1,4-Difluorobenzene	103.4		70-130	%		05-JUN-18	R4068789
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		05-JUN-18	R4068789
F1-BTEX	<25		25	ug/L		12-JUN-18	
F2 (C10-C16)	<100		100	ug/L	07-JUN-18	07-JUN-18	R4075917
F2-Naphth	<100		100	ug/L		12-JUN-18	
F3 (C16-C34)	<250		250	ug/L	07-JUN-18	07-JUN-18	R4075917
F3-PAH	<250		250	ug/L		12-JUN-18	
F4 (C34-C50)	<250		250	ug/L	07-JUN-18	07-JUN-18	R4075917
Total Hydrocarbons (C6-C50)	<370		370	ug/L		12-JUN-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105017-1 GW-11149990-060118-TW-002 Sampled By: TYLER W on 01-JUN-18 @ 13:10 Matrix: WATER							
Hydrocarbons							
Chrom. to baseline at nC50	YES				07-JUN-18	07-JUN-18	R4075917
Surrogate: 2-Bromobenzotrifluoride	76.5		60-140	%	07-JUN-18	07-JUN-18	R4075917
Surrogate: 3,4-Dichlorotoluene	87.6		60-140	%		05-JUN-18	R4068789
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	0.038		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Acenaphthylene	0.082		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Anthracene	0.043		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Benzo(a)anthracene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Benzo(a)pyrene	<0.010		0.010	ug/L	07-JUN-18	11-JUN-18	R4076297
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Chrysene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Fluoranthene	0.117		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Fluorene	0.076		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
1+2-Methylnaphthalenes	0.179		0.028	ug/L		12-JUN-18	
1-Methylnaphthalene	0.080		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
2-Methylnaphthalene	0.099		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Naphthalene	0.353		0.050	ug/L	07-JUN-18	11-JUN-18	R4076297
Phenanthrene	0.161		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Pyrene	0.087		0.020	ug/L	07-JUN-18	11-JUN-18	R4076297
Surrogate: d10-Acenaphthene	99.1		60-140	%	07-JUN-18	11-JUN-18	R4076297
Surrogate: d12-Chrysene	95.6		60-140	%	07-JUN-18	11-JUN-18	R4076297
Surrogate: d8-Naphthalene	110.1		60-140	%	07-JUN-18	11-JUN-18	R4076297
Surrogate: d10-Phenanthrene	105.5		60-140	%	07-JUN-18	11-JUN-18	R4076297
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
4-Chloroaniline	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
2-Chlorophenol	<0.30		0.30	ug/L	08-JUN-18	12-JUN-18	R4080027
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
2,4-Dichlorophenol	<0.30		0.30	ug/L	08-JUN-18	12-JUN-18	R4080027
Diethylphthalate	<0.20		0.20	ug/L	08-JUN-18	12-JUN-18	R4080027
Dimethylphthalate	<0.20		0.20	ug/L	08-JUN-18	12-JUN-18	R4080027
2,4-Dimethylphenol	<0.50		0.50	ug/L	08-JUN-18	12-JUN-18	R4080027
2,4-Dinitrophenol	<1.0		1.0	ug/L	08-JUN-18	12-JUN-18	R4080027
2,4-Dinitrotoluene	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
2,6-Dinitrotoluene	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105017-1 GW-11149990-060118-TW-002 Sampled By: TYLER W on 01-JUN-18 @ 13:10 Matrix: WATER							
Semi-Volatile Organics							
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		12-JUN-18	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	08-JUN-18	12-JUN-18	R4080027
Pentachlorophenol	<0.50		0.50	ug/L	08-JUN-18	12-JUN-18	R4080027
Phenol	<2.0	RRR	2.0	ug/L	08-JUN-18	12-JUN-18	R4080027
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	08-JUN-18	12-JUN-18	R4080027
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	08-JUN-18	12-JUN-18	R4080027
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	08-JUN-18	12-JUN-18	R4080027
Surrogate: 2-Fluorobiphenyl	100.9		50-140	%	08-JUN-18	12-JUN-18	R4080027
Surrogate: Nitrobenzene d5	100.6		50-140	%	08-JUN-18	12-JUN-18	R4080027
Surrogate: Phenol d5	20.4	RRR	30-130	%	08-JUN-18	12-JUN-18	R4080027
Surrogate: p-Terphenyl d14	109.1		60-140	%	08-JUN-18	12-JUN-18	R4080027
Surrogate: 2,4,6-Tribromophenol	102.7		50-140	%	08-JUN-18	12-JUN-18	R4080027
Report Remarks : RRR: Detection limit raised due to low surrogate recovery & low phenol recovery in laboratory control sample.							
L2105017-4 TB-11149990-060118-TW-002 Sampled By: TYLER W on 01-JUN-18 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		05-JUN-18	R4068789
Benzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Bromodichloromethane	<2.0		2.0	ug/L		05-JUN-18	R4068789
Bromoform	<5.0		5.0	ug/L		05-JUN-18	R4068789
Bromomethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Carbon tetrachloride	<0.20		0.20	ug/L		05-JUN-18	R4068789
Chlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Dibromochloromethane	<2.0		2.0	ug/L		05-JUN-18	R4068789
Chloroform	<1.0		1.0	ug/L		05-JUN-18	R4068789
1,2-Dibromoethane	<0.20		0.20	ug/L		05-JUN-18	R4068789
1,2-Dichlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,3-Dichlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,4-Dichlorobenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Dichlorodifluoromethane	<2.0		2.0	ug/L		05-JUN-18	R4068789
1,1-Dichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,2-Dichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1-Dichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Methylene Chloride	<5.0		5.0	ug/L		05-JUN-18	R4068789
1,2-Dichloropropane	<0.50		0.50	ug/L		05-JUN-18	R4068789
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		05-JUN-18	R4068789
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		05-JUN-18	R4068789
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		05-JUN-18	
Ethylbenzene	<0.50		0.50	ug/L		05-JUN-18	R4068789

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2105017-4 TB-11149990-060118-TW-002 Sampled By: TYLER W on 01-JUN-18 Matrix: WATER							
Volatile Organic Compounds							
n-Hexane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Methyl Ethyl Ketone	<20		20	ug/L		05-JUN-18	R4068789
Methyl Isobutyl Ketone	<20		20	ug/L		05-JUN-18	R4068789
MTBE	<2.0		2.0	ug/L		05-JUN-18	R4068789
Styrene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Tetrachloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Toluene	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,1-Trichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
1,1,2-Trichloroethane	<0.50		0.50	ug/L		05-JUN-18	R4068789
Trichloroethylene	<0.50		0.50	ug/L		05-JUN-18	R4068789
Trichlorofluoromethane	<5.0		5.0	ug/L		05-JUN-18	R4068789
Vinyl chloride	<0.50		0.50	ug/L		05-JUN-18	R4068789
o-Xylene	<0.30		0.30	ug/L		05-JUN-18	R4068789
m+p-Xylenes	<0.40		0.40	ug/L		05-JUN-18	R4068789
Xylenes (Total)	<0.50		0.50	ug/L		05-JUN-18	
Surrogate: 4-Bromofluorobenzene	104.2		70-130	%		05-JUN-18	R4068789
Surrogate: 1,4-Difluorobenzene	103.6		70-130	%		05-JUN-18	R4068789
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		05-JUN-18	R4068789
F1-BTEX	<25		25	ug/L		05-JUN-18	
Surrogate: 3,4-Dichlorotoluene	99.7		60-140	%		05-JUN-18	R4068789

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2105017-1
Comments:	RRQC:Recovery is outside ALS control limits. Detection limits in associated samples have been raised accordingly.		
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2105017-1
Matrix Spike	Boron (B)-Dissolved	MS-B	L2105017-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2105017-1
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2105017-1
Laboratory Control Sample	Phenol	RRQC	L2105017-1
Comments:	RRQC:Recovery is outside ALS control limits. Detection limits in associated samples have been raised accordingly.		

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
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.
RRQC	Refer to report remarks for information regarding this QC result.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

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).

ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

C-DIS-ORG-WT	Water	Dissolved Organic Carbon	APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

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).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
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).

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.

Reference Information

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 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).

HARDNESS-CALC-WT Water Hardness APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

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

NH3-WT Water Ammonia, Total as N EPA 350.1
Sample is measured colorimetrically. When sample is turbid a distillation step is required, sample is distilled into a solution of boric acid and measured colorimetrically.

NO2-IC-WT Water Nitrite in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

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).

PH-WT Water pH APHA 4500 H-Electrode

Reference Information

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

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

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

SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

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.

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

Chain of Custody Numbers:

17-621916

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 weight of sample
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.

Quality Control Report

Workorder: L2105017 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Water**							
Batch R4080027								
WG2792366-2 LCS								
1,2,4-Trichlorobenzene			69.5		%		50-140	12-JUN-18
2-Chlorophenol			74.3		%		50-140	12-JUN-18
2,4-Dichlorophenol			98.4		%		50-140	12-JUN-18
2,4-Dimethylphenol			85.4		%		30-130	12-JUN-18
2,4-Dinitrophenol			150.0	LCS-H	%		50-140	12-JUN-18
2,4-Dinitrotoluene			102.7		%		50-140	12-JUN-18
2,4,5-Trichlorophenol			110.3		%		50-140	12-JUN-18
2,4,6-Trichlorophenol			106.2		%		50-140	12-JUN-18
2,6-Dinitrotoluene			103.9		%		50-140	12-JUN-18
3,3'-Dichlorobenzidine			68.8		%		30-130	12-JUN-18
4-Chloroaniline			69.4		%		30-130	12-JUN-18
Biphenyl			87.8		%		50-140	12-JUN-18
Bis(2-chloroethyl)ether			103.6		%		50-140	12-JUN-18
Bis(2-chloroisopropyl)ether			87.8		%		50-140	12-JUN-18
Bis(2-ethylhexyl)phthalate			124.4		%		50-140	12-JUN-18
Diethylphthalate			98.2		%		50-140	12-JUN-18
Dimethylphthalate			97.0		%		50-140	12-JUN-18
Pentachlorophenol			134.6		%		50-140	12-JUN-18
Phenol			17.7	RRQC	%		30-130	12-JUN-18
COMMENTS: RRQC:Recovery is outside ALS control limits. Detection limits in associated samples have been raised accordingly.								
WG2792366-3 LCSD		**WG2792366-2**						
1,2,4-Trichlorobenzene		69.5	60.0		%	15	50	12-JUN-18
2-Chlorophenol		74.3	72.3		%	2.8	50	12-JUN-18
2,4-Dichlorophenol		98.4	98.9		%	0.5	50	12-JUN-18
2,4-Dimethylphenol		85.4	76.6		%	11	50	12-JUN-18
2,4-Dinitrophenol		150.0	145.1		%	3.3	50	12-JUN-18
2,4-Dinitrotoluene		102.7	106.7		%	3.8	50	12-JUN-18
2,4,5-Trichlorophenol		110.3	112.8		%	2.3	50	12-JUN-18
2,4,6-Trichlorophenol		106.2	107.9		%	1.7	50	12-JUN-18
2,6-Dinitrotoluene		103.9	108.1		%	3.9	50	12-JUN-18
3,3'-Dichlorobenzidine		68.8	75.5		%	9.3	50	12-JUN-18
4-Chloroaniline		69.4	71.5		%	3.0	50	12-JUN-18
Biphenyl		87.8	82.7		%	6.1	50	12-JUN-18
Bis(2-chloroethyl)ether		103.6	103.5		%	0.1	50	12-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	**Water**							
Batch R4080027								
WG2792366-3 LCSD		**WG2792366-2**						
Bis(2-chloroisopropyl)ether		87.8	86.7		%	1.3	50	12-JUN-18
Bis(2-ethylhexyl)phthalate		124.4	123.1		%	1.1	50	12-JUN-18
Diethylphthalate		98.2	103.2		%	5.0	50	12-JUN-18
Dimethylphthalate		97.0	101.7		%	4.7	50	12-JUN-18
Pentachlorophenol		134.6	130.9		%	2.7	50	12-JUN-18
Phenol		17.7	15.9		%	11	50	12-JUN-18
COMMENTS: RRQC:Recovery is outside ALS control limits. Detection limits in associated samples have been raised accordingly.								
WG2792366-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	12-JUN-18
2-Chlorophenol			<0.30		ug/L		0.3	12-JUN-18
2,4-Dichlorophenol			<0.30		ug/L		0.3	12-JUN-18
2,4-Dimethylphenol			<0.50		ug/L		0.5	12-JUN-18
2,4-Dinitrophenol			<1.0		ug/L		1	12-JUN-18
2,4-Dinitrotoluene			<0.40		ug/L		0.4	12-JUN-18
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	12-JUN-18
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	12-JUN-18
2,6-Dinitrotoluene			<0.40		ug/L		0.4	12-JUN-18
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	12-JUN-18
4-Chloroaniline			<0.40		ug/L		0.4	12-JUN-18
Biphenyl			<0.40		ug/L		0.4	12-JUN-18
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	12-JUN-18
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	12-JUN-18
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	12-JUN-18
Diethylphthalate			<0.20		ug/L		0.2	12-JUN-18
Dimethylphthalate			<0.20		ug/L		0.2	12-JUN-18
Pentachlorophenol			<0.50		ug/L		0.5	12-JUN-18
Phenol			<0.50		ug/L		0.5	12-JUN-18
Surrogate: 2-Fluorobiphenyl			87.9		%		50-140	12-JUN-18
Surrogate: 2,4,6-Tribromophenol			92.4		%		50-140	12-JUN-18
Surrogate: Nitrobenzene d5			92.5		%		50-140	12-JUN-18
Surrogate: p-Terphenyl d14			117.8		%		60-140	12-JUN-18
Surrogate: Phenol d5			18.5	MBS	%		30-130	12-JUN-18
CN-WAD-R511-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT	**Water**							
Batch R4078221								
WG2792444-3 DUP		**L2105017-1**						
Cyanide, Weak Acid Diss		<2.0	<2.0	RPD-NA	ug/L	N/A	20	08-JUN-18
WG2792444-2 LCS								
Cyanide, Weak Acid Diss			95.9		%		80-120	08-JUN-18
WG2792444-1 MB								
Cyanide, Weak Acid Diss			<2.0		ug/L		2	08-JUN-18
WG2792444-4 MS		**L2105017-1**						
Cyanide, Weak Acid Diss			88.3		%		75-125	08-JUN-18
CR-CR6-IC-R511-WT	**Water**							
Batch R4068987								
WG2787888-9 DUP		**WG2787888-8**						
Chromium, Hexavalent		<1.0	<1.0	RPD-NA	ug/L	N/A	20	04-JUN-18
WG2787888-7 LCS								
Chromium, Hexavalent			101.8		%		80-120	04-JUN-18
WG2787888-6 MB								
Chromium, Hexavalent			<1.0		ug/L		1	04-JUN-18
WG2787888-10 MS		**WG2787888-8**						
Chromium, Hexavalent			100.9		%		70-130	04-JUN-18
F1-HS-511-WT	**Water**							
Batch R4068789								
WG2786511-4 DUP		**WG2786511-3**						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	05-JUN-18
WG2786511-1 LCS								
F1 (C6-C10)			105.8		%		80-120	05-JUN-18
WG2786511-2 MB								
F1 (C6-C10)			<25		ug/L		25	05-JUN-18
Surrogate: 3,4-Dichlorotoluene			107.6		%		60-140	05-JUN-18
WG2786511-5 MS		**WG2786511-3**						
F1 (C6-C10)			86.4		%		60-140	05-JUN-18
F2-F4-511-WT	**Water**							
Batch R4075917								
WG2790808-2 LCS								
F2 (C10-C16)			104.0		%		70-130	07-JUN-18
F3 (C16-C34)			101.8		%		70-130	07-JUN-18
F4 (C34-C50)			111.0		%		70-130	07-JUN-18
WG2790808-3 LCSD		**WG2790808-2**						
F2 (C10-C16)		104.0	103.2		%	0.8	50	07-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	**Water**							
Batch R4075917								
WG2790808-3 LCSD		**WG2790808-2**						
F3 (C16-C34)		101.8	101.8		%	0.1	50	07-JUN-18
F4 (C34-C50)		111.0	105.8		%	4.8	50	07-JUN-18
WG2790808-1 MB								
F2 (C10-C16)			<100		ug/L		100	07-JUN-18
F3 (C16-C34)			<250		ug/L		250	07-JUN-18
F4 (C34-C50)			<250		ug/L		250	07-JUN-18
Surrogate: 2-Bromobenzotrifluoride			104.7		%		60-140	07-JUN-18
HG-D-UG/L-CVAA-WT	**Water**							
Batch R4069634								
WG2788727-4 DUP		**WG2788727-3**						
Mercury (Hg)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	05-JUN-18
WG2788727-2 LCS								
Mercury (Hg)-Dissolved			95.6		%		80-120	05-JUN-18
WG2788727-1 MB								
Mercury (Hg)-Dissolved			<0.010		ug/L		0.01	05-JUN-18
WG2788727-6 MS		**WG2788727-5**						
Mercury (Hg)-Dissolved			91.0		%		70-130	05-JUN-18
MET-D-UG/L-MS-WT	**Water**							
Batch R4071168								
WG2787661-4 DUP		**WG2787661-3**						
Antimony (Sb)-Dissolved		0.37	0.36		ug/L	3.0	20	05-JUN-18
Arsenic (As)-Dissolved		0.30	0.31		ug/L	4.9	20	05-JUN-18
Barium (Ba)-Dissolved		356	347		ug/L	2.5	20	05-JUN-18
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	05-JUN-18
Boron (B)-Dissolved		45	45		ug/L	0.9	20	05-JUN-18
Cadmium (Cd)-Dissolved		0.0174	0.0156		ug/L	11	20	05-JUN-18
Chromium (Cr)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	05-JUN-18
Cobalt (Co)-Dissolved		0.14	0.13		ug/L	2.6	20	05-JUN-18
Copper (Cu)-Dissolved		4.14	4.17		ug/L	0.9	20	05-JUN-18
Lead (Pb)-Dissolved		3.85	3.97		ug/L	2.9	20	05-JUN-18
Molybdenum (Mo)-Dissolved		2.14	2.17		ug/L	1.2	20	05-JUN-18
Nickel (Ni)-Dissolved		0.68	0.70		ug/L	3.0	20	05-JUN-18
Selenium (Se)-Dissolved		0.124	0.137		ug/L	11	20	05-JUN-18
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4071168								
WG2787661-4 DUP		**WG2787661-3**						
Sodium (Na)-Dissolved		110000	106000		ug/L	3.5	20	05-JUN-18
Thallium (Tl)-Dissolved		<0.025	<0.025	RPD-NA	ug/L	2.9	20	05-JUN-18
Uranium (U)-Dissolved		0.591	0.613		ug/L	3.8	20	05-JUN-18
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	05-JUN-18
Zinc (Zn)-Dissolved		13.0	12.8		ug/L	1.4	20	05-JUN-18
WG2787661-2 LCS								
Antimony (Sb)-Dissolved			103.7		%		80-120	05-JUN-18
Arsenic (As)-Dissolved			96.4		%		80-120	05-JUN-18
Barium (Ba)-Dissolved			103.5		%		80-120	05-JUN-18
Beryllium (Be)-Dissolved			98.1		%		80-120	05-JUN-18
Boron (B)-Dissolved			98.7		%		80-120	05-JUN-18
Cadmium (Cd)-Dissolved			98.9		%		80-120	05-JUN-18
Chromium (Cr)-Dissolved			97.9		%		80-120	05-JUN-18
Cobalt (Co)-Dissolved			99.5		%		80-120	05-JUN-18
Copper (Cu)-Dissolved			98.6		%		80-120	05-JUN-18
Lead (Pb)-Dissolved			104.1		%		80-120	05-JUN-18
Molybdenum (Mo)-Dissolved			100.5		%		80-120	05-JUN-18
Nickel (Ni)-Dissolved			99.7		%		80-120	05-JUN-18
Selenium (Se)-Dissolved			97.9		%		80-120	05-JUN-18
Silver (Ag)-Dissolved			103.8		%		80-120	05-JUN-18
Sodium (Na)-Dissolved			99.0		%		80-120	05-JUN-18
Thallium (Tl)-Dissolved			101.0		%		80-120	05-JUN-18
Uranium (U)-Dissolved			106.2		%		80-120	05-JUN-18
Vanadium (V)-Dissolved			100.1		%		80-120	05-JUN-18
Zinc (Zn)-Dissolved			94.3		%		80-120	05-JUN-18
WG2787661-1 MB								
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	05-JUN-18
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	05-JUN-18
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	05-JUN-18
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	05-JUN-18
Boron (B)-Dissolved			<10		ug/L		10	05-JUN-18
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	05-JUN-18
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	05-JUN-18
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R4071168								
WG2787661-1 MB								
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	05-JUN-18
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	05-JUN-18
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	05-JUN-18
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	05-JUN-18
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	05-JUN-18
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	05-JUN-18
Sodium (Na)-Dissolved			<50		ug/L		50	05-JUN-18
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	05-JUN-18
Uranium (U)-Dissolved			<0.010		ug/L		0.01	05-JUN-18
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	05-JUN-18
Zinc (Zn)-Dissolved			<1.0		ug/L		1	05-JUN-18
WG2787661-5 MS		**WG2787661-6**						
Antimony (Sb)-Dissolved			97.6		%		70-130	05-JUN-18
Arsenic (As)-Dissolved			94.6		%		70-130	05-JUN-18
Barium (Ba)-Dissolved			N/A	MS-B	%		-	05-JUN-18
Beryllium (Be)-Dissolved			99.7		%		70-130	05-JUN-18
Boron (B)-Dissolved			N/A	MS-B	%		-	05-JUN-18
Cadmium (Cd)-Dissolved			96.3		%		70-130	05-JUN-18
Chromium (Cr)-Dissolved			92.1		%		70-130	05-JUN-18
Cobalt (Co)-Dissolved			92.7		%		70-130	05-JUN-18
Copper (Cu)-Dissolved			93.1		%		70-130	05-JUN-18
Lead (Pb)-Dissolved			90.3		%		70-130	05-JUN-18
Molybdenum (Mo)-Dissolved			95.1		%		70-130	05-JUN-18
Nickel (Ni)-Dissolved			92.1		%		70-130	05-JUN-18
Selenium (Se)-Dissolved			94.9		%		70-130	05-JUN-18
Silver (Ag)-Dissolved			87.1		%		70-130	05-JUN-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	05-JUN-18
Thallium (Tl)-Dissolved			90.8		%		70-130	05-JUN-18
Uranium (U)-Dissolved			N/A	MS-B	%		-	05-JUN-18
Vanadium (V)-Dissolved			96.3		%		70-130	05-JUN-18
Zinc (Zn)-Dissolved			92.7		%		70-130	05-JUN-18
PAH-511-WT	**Water**							

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R4076297								
WG2790808-2 LCS								
1-Methylnaphthalene			103.3		%		50-140	08-JUN-18
2-Methylnaphthalene			98.4		%		50-140	08-JUN-18
Acenaphthene			101.6		%		50-140	08-JUN-18
Acenaphthylene			102.8		%		50-140	08-JUN-18
Anthracene			90.8		%		50-140	08-JUN-18
Benzo(a)anthracene			97.8		%		50-140	08-JUN-18
Benzo(a)pyrene			96.0		%		50-140	08-JUN-18
Benzo(b)fluoranthene			87.7		%		50-140	08-JUN-18
Benzo(g,h,i)perylene			108.4		%		50-140	08-JUN-18
Benzo(k)fluoranthene			110.9		%		50-140	08-JUN-18
Chrysene			123.5		%		50-140	08-JUN-18
Dibenzo(ah)anthracene			107.0		%		50-140	08-JUN-18
Fluoranthene			108.6		%		50-140	08-JUN-18
Fluorene			105.6		%		50-140	08-JUN-18
Indeno(1,2,3-cd)pyrene			103.0		%		50-140	08-JUN-18
Naphthalene			104.2		%		50-140	08-JUN-18
Phenanthrene			106.1		%		50-140	08-JUN-18
Pyrene			108.2		%		50-140	08-JUN-18
WG2790808-3 LCSD		**WG2790808-2**						
1-Methylnaphthalene		103.3	105.8		%	2.4	50	08-JUN-18
2-Methylnaphthalene		98.4	100.2		%	1.9	50	08-JUN-18
Acenaphthene		101.6	102.6		%	1.0	50	08-JUN-18
Acenaphthylene		102.8	103.5		%	0.7	50	08-JUN-18
Anthracene		90.8	90.0		%	0.9	50	08-JUN-18
Benzo(a)anthracene		97.8	97.1		%	0.7	50	08-JUN-18
Benzo(a)pyrene		96.0	97.0		%	1.0	50	08-JUN-18
Benzo(b)fluoranthene		87.7	86.2		%	1.7	50	08-JUN-18
Benzo(g,h,i)perylene		108.4	114.8		%	5.7	50	08-JUN-18
Benzo(k)fluoranthene		110.9	112.2		%	1.2	50	08-JUN-18
Chrysene		123.5	123.1		%	0.3	50	08-JUN-18
Dibenzo(ah)anthracene		107.0	106.2		%	0.8	50	08-JUN-18
Fluoranthene		108.6	108.5		%	0.1	50	08-JUN-18
Fluorene		105.6	105.2		%	0.4	50	08-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R4076297								
WG2790808-3 LCSD		**WG2790808-2**						
Indeno(1,2,3-cd)pyrene		103.0	102.2		%	0.8	50	08-JUN-18
Naphthalene		104.2	107.5		%	3.2	50	08-JUN-18
Phenanthrene		106.1	105.4		%	0.7	50	08-JUN-18
Pyrene		108.2	110.3		%	2.0	50	08-JUN-18
WG2790808-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	08-JUN-18
2-Methylnaphthalene			<0.020		ug/L		0.02	08-JUN-18
Acenaphthene			<0.020		ug/L		0.02	08-JUN-18
Acenaphthylene			<0.020		ug/L		0.02	08-JUN-18
Anthracene			<0.020		ug/L		0.02	08-JUN-18
Benzo(a)anthracene			<0.020		ug/L		0.02	08-JUN-18
Benzo(a)pyrene			<0.010		ug/L		0.01	08-JUN-18
Benzo(b)fluoranthene			<0.020		ug/L		0.02	08-JUN-18
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	08-JUN-18
Benzo(k)fluoranthene			<0.020		ug/L		0.02	08-JUN-18
Chrysene			<0.020		ug/L		0.02	08-JUN-18
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	08-JUN-18
Fluoranthene			<0.020		ug/L		0.02	08-JUN-18
Fluorene			<0.020		ug/L		0.02	08-JUN-18
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	08-JUN-18
Naphthalene			<0.050		ug/L		0.05	08-JUN-18
Phenanthrene			<0.020		ug/L		0.02	08-JUN-18
Pyrene			<0.020		ug/L		0.02	08-JUN-18
Surrogate: d8-Naphthalene			141.2	RRQC	%		60-140	08-JUN-18
Surrogate: d10-Phenanthrene			118.5		%		60-140	08-JUN-18
Surrogate: d12-Chrysene			116.1		%		60-140	08-JUN-18
Surrogate: d10-Acenaphthene			120.9		%		60-140	08-JUN-18
COMMENTS: RRQC - surrogate slightly above ALS DQO.								
PH-WT	**Water**							
Batch R4075090								
WG2789968-3 DUP		**WG2789968-2**						
pH		6.54	6.41	J	pH units	0.13	0.2	07-JUN-18
WG2789968-1 LCS								
pH			6.98		pH units		6.9-7.1	07-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4068789								
WG2786511-4 DUP		**WG2786511-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-JUN-18
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	05-JUN-18
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-JUN-18
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-JUN-18
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-JUN-18
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-JUN-18
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-JUN-18
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-JUN-18
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-JUN-18
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	05-JUN-18
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-JUN-18
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-JUN-18
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-JUN-18
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-JUN-18
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-JUN-18
Styrene		<0.50	<0.50		ug/L			05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4068789								
WG2786511-4 DUP		**WG2786511-3**						
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-JUN-18
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-JUN-18
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-JUN-18
WG2786511-1 LCS								
1,1,1,2-Tetrachloroethane			103.2		%		70-130	05-JUN-18
1,1,2,2-Tetrachloroethane			95.9		%		70-130	05-JUN-18
1,1,1-Trichloroethane			108.9		%		70-130	05-JUN-18
1,1,2-Trichloroethane			101.7		%		70-130	05-JUN-18
1,1-Dichloroethane			107.2		%		70-130	05-JUN-18
1,1-Dichloroethylene			99.9		%		70-130	05-JUN-18
1,2-Dibromoethane			102.3		%		70-130	05-JUN-18
1,2-Dichlorobenzene			100.0		%		70-130	05-JUN-18
1,2-Dichloroethane			110.6		%		70-130	05-JUN-18
1,2-Dichloropropane			103.0		%		70-130	05-JUN-18
1,3-Dichlorobenzene			100.3		%		70-130	05-JUN-18
1,4-Dichlorobenzene			102.4		%		70-130	05-JUN-18
Acetone			110.9		%		60-140	05-JUN-18
Benzene			103.9		%		70-130	05-JUN-18
Bromodichloromethane			104.0		%		70-130	05-JUN-18
Bromoform			98.5		%		70-130	05-JUN-18
Bromomethane			109.0		%		60-140	05-JUN-18
Carbon tetrachloride			110.2		%		70-130	05-JUN-18
Chlorobenzene			103.0		%		70-130	05-JUN-18
Chloroform			108.6		%		70-130	05-JUN-18
cis-1,2-Dichloroethylene			106.5		%		70-130	05-JUN-18
cis-1,3-Dichloropropene			106.9		%		70-130	05-JUN-18
Dibromochloromethane			107.8		%		70-130	05-JUN-18
Dichlorodifluoromethane			102.5		%		50-140	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4068789								
WG2786511-1 LCS								
Ethylbenzene			96.9		%		70-130	05-JUN-18
n-Hexane			110.4		%		70-130	05-JUN-18
m+p-Xylenes			99.7		%		70-130	05-JUN-18
Methyl Ethyl Ketone			99.2		%		60-140	05-JUN-18
Methyl Isobutyl Ketone			100.5		%		60-140	05-JUN-18
Methylene Chloride			109.7		%		70-130	05-JUN-18
MTBE			105.1		%		70-130	05-JUN-18
o-Xylene			97.6		%		70-130	05-JUN-18
Styrene			95.3		%		70-130	05-JUN-18
Tetrachloroethylene			106.2		%		70-130	05-JUN-18
Toluene			98.3		%		70-130	05-JUN-18
trans-1,2-Dichloroethylene			108.3		%		70-130	05-JUN-18
trans-1,3-Dichloropropene			102.8		%		70-130	05-JUN-18
Trichloroethylene			111.2		%		70-130	05-JUN-18
Trichlorofluoromethane			114.8		%		60-140	05-JUN-18
Vinyl chloride			100.6		%		60-140	05-JUN-18
WG2786511-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1-Dichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	05-JUN-18
1,2-Dibromoethane			<0.20		ug/L		0.2	05-JUN-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	05-JUN-18
1,2-Dichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,2-Dichloropropane			<0.50		ug/L		0.5	05-JUN-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	05-JUN-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	05-JUN-18
Acetone			<30		ug/L		30	05-JUN-18
Benzene			<0.50		ug/L		0.5	05-JUN-18
Bromodichloromethane			<2.0		ug/L		2	05-JUN-18
Bromoform			<5.0		ug/L		5	05-JUN-18
Bromomethane			<0.50		ug/L		0.5	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4068789								
WG2786511-2 MB								
Carbon tetrachloride			<0.20		ug/L		0.2	05-JUN-18
Chlorobenzene			<0.50		ug/L		0.5	05-JUN-18
Chloroform			<1.0		ug/L		1	05-JUN-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-JUN-18
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	05-JUN-18
Dibromochloromethane			<2.0		ug/L		2	05-JUN-18
Dichlorodifluoromethane			<2.0		ug/L		2	05-JUN-18
Ethylbenzene			<0.50		ug/L		0.5	05-JUN-18
n-Hexane			<0.50		ug/L		0.5	05-JUN-18
m+p-Xylenes			<0.40		ug/L		0.4	05-JUN-18
Methyl Ethyl Ketone			<20		ug/L		20	05-JUN-18
Methyl Isobutyl Ketone			<20		ug/L		20	05-JUN-18
Methylene Chloride			<5.0		ug/L		5	05-JUN-18
MTBE			<2.0		ug/L		2	05-JUN-18
o-Xylene			<0.30		ug/L		0.3	05-JUN-18
Styrene			<0.50		ug/L		0.5	05-JUN-18
Tetrachloroethylene			<0.50		ug/L		0.5	05-JUN-18
Toluene			<0.50		ug/L		0.5	05-JUN-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-JUN-18
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	05-JUN-18
Trichloroethylene			<0.50		ug/L		0.5	05-JUN-18
Trichlorofluoromethane			<5.0		ug/L		5	05-JUN-18
Vinyl chloride			<0.50		ug/L		0.5	05-JUN-18
Surrogate: 1,4-Difluorobenzene			103.6		%		70-130	05-JUN-18
Surrogate: 4-Bromofluorobenzene			103.9		%		70-130	05-JUN-18
WG2786511-5 MS		**WG2786511-3**						
1,1,1,2-Tetrachloroethane			103.8		%		50-140	05-JUN-18
1,1,2,2-Tetrachloroethane			107.1		%		50-140	05-JUN-18
1,1,1-Trichloroethane			105.7		%		50-140	05-JUN-18
1,1,2-Trichloroethane			110.6		%		50-140	05-JUN-18
1,1-Dichloroethane			108.0		%		50-140	05-JUN-18
1,1-Dichloroethylene			95.1		%		50-140	05-JUN-18
1,2-Dibromoethane			113.1		%		50-140	05-JUN-18
1,2-Dichlorobenzene			99.6		%		50-140	05-JUN-18

Quality Control Report

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R4068789								
WG2786511-5 MS		**WG2786511-3**						
1,2-Dichloroethane			122.4		%		50-140	05-JUN-18
1,2-Dichloropropane			107.8		%		50-140	05-JUN-18
1,3-Dichlorobenzene			96.1		%		50-140	05-JUN-18
1,4-Dichlorobenzene			99.2		%		50-140	05-JUN-18
Acetone			135.5		%		50-140	05-JUN-18
Benzene			104.3		%		50-140	05-JUN-18
Bromodichloromethane			109.8		%		50-140	05-JUN-18
Bromoform			108.1		%		50-140	05-JUN-18
Bromomethane			105.5		%		50-140	05-JUN-18
Carbon tetrachloride			105.9		%		50-140	05-JUN-18
Chlorobenzene			102.5		%		50-140	05-JUN-18
Chloroform			111.0		%		50-140	05-JUN-18
cis-1,2-Dichloroethylene			109.1		%		50-140	05-JUN-18
cis-1,3-Dichloropropene			108.0		%		50-140	05-JUN-18
Dibromochloromethane			114.3		%		50-140	05-JUN-18
Dichlorodifluoromethane			90.8		%		50-140	05-JUN-18
Ethylbenzene			91.5		%		50-140	05-JUN-18
n-Hexane			102.1		%		50-140	05-JUN-18
m+p-Xylenes			94.2		%		50-140	05-JUN-18
Methyl Ethyl Ketone			120.3		%		50-140	05-JUN-18
Methyl Isobutyl Ketone			119.3		%		50-140	05-JUN-18
Methylene Chloride			114.6		%		50-140	05-JUN-18
MTBE			104.5		%		50-140	05-JUN-18
o-Xylene			93.8		%		50-140	05-JUN-18
Styrene			92.3		%		50-140	05-JUN-18
Tetrachloroethylene			98.8		%		50-140	05-JUN-18
Toluene			94.4		%		50-140	05-JUN-18
trans-1,2-Dichloroethylene			105.2		%		50-140	05-JUN-18
trans-1,3-Dichloropropene			102.7		%		50-140	05-JUN-18
Trichloroethylene			108.3		%		50-140	05-JUN-18
Trichlorofluoromethane			107.0		%		50-140	05-JUN-18
Vinyl chloride			93.7		%		50-140	05-JUN-18

Quality Control Report

Workorder: L2105017 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

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.
MBS	Surrogate recovery in Method Blank was outside ALS DQO. Moderately low-biased results in the MB do not significantly affect its purpose.
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.
RRQC	Refer to report remarks for information regarding this QC result.

Quality Control Report

Workorder: L2105017 Report Date: 26-JUL-18

Client: GHD Limited (Waterloo)
651 COLBY STREET
WATERLOO ON N2V 1C2
Contact: JENNIFER BALKWILL

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	01-JUN-18 13:10	07-JUN-18 00:00	4	5	days	EHT

Legend & Qualifier Definitions:

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

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2105017 were received on 01-JUN-18 19:05.

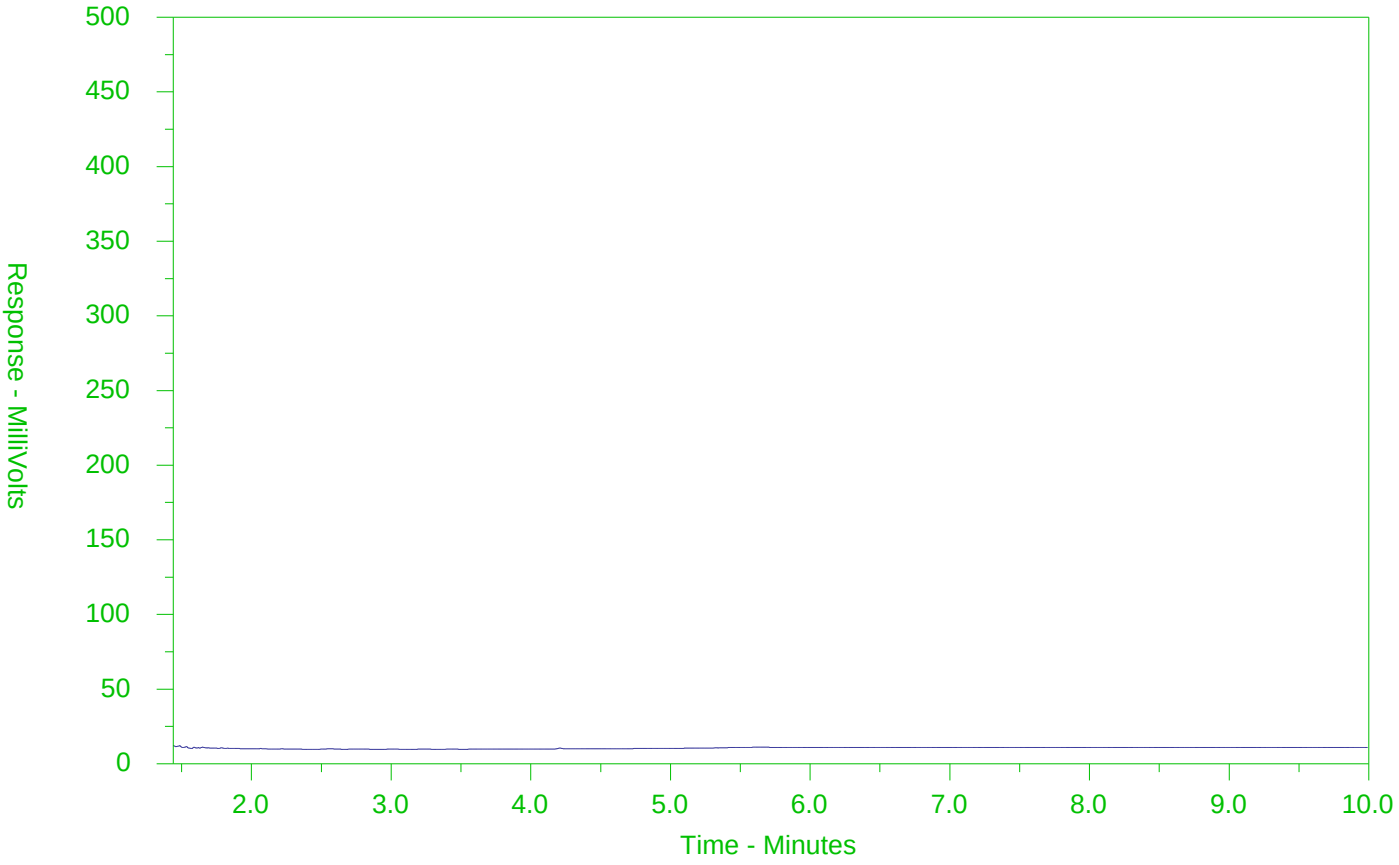
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where 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: L2105017-1
Client Sample ID: GW-11149990-060118-TW-002



←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.

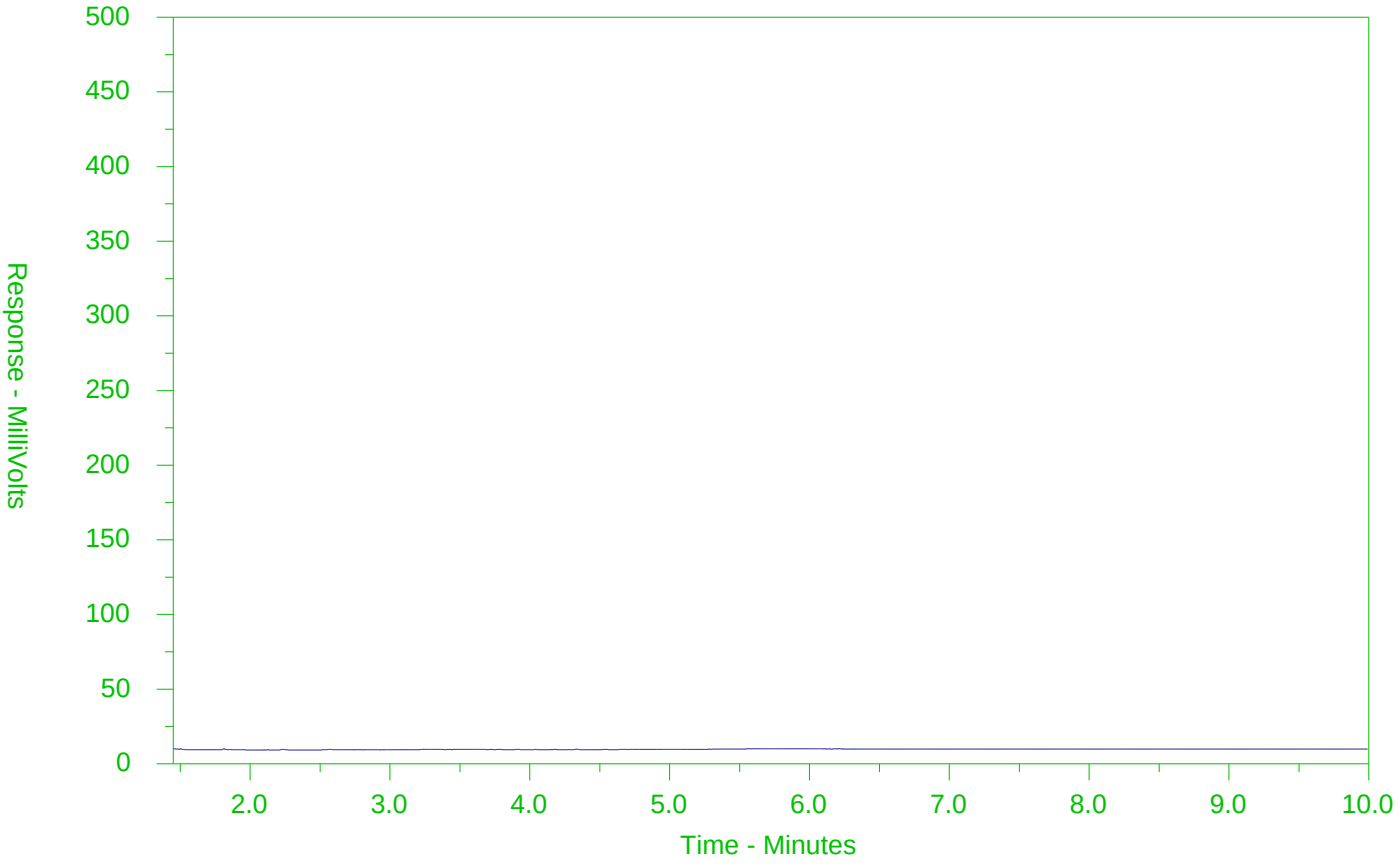
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2105017-2
Client Sample ID: GW-11149990-060118-TW-015



←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.

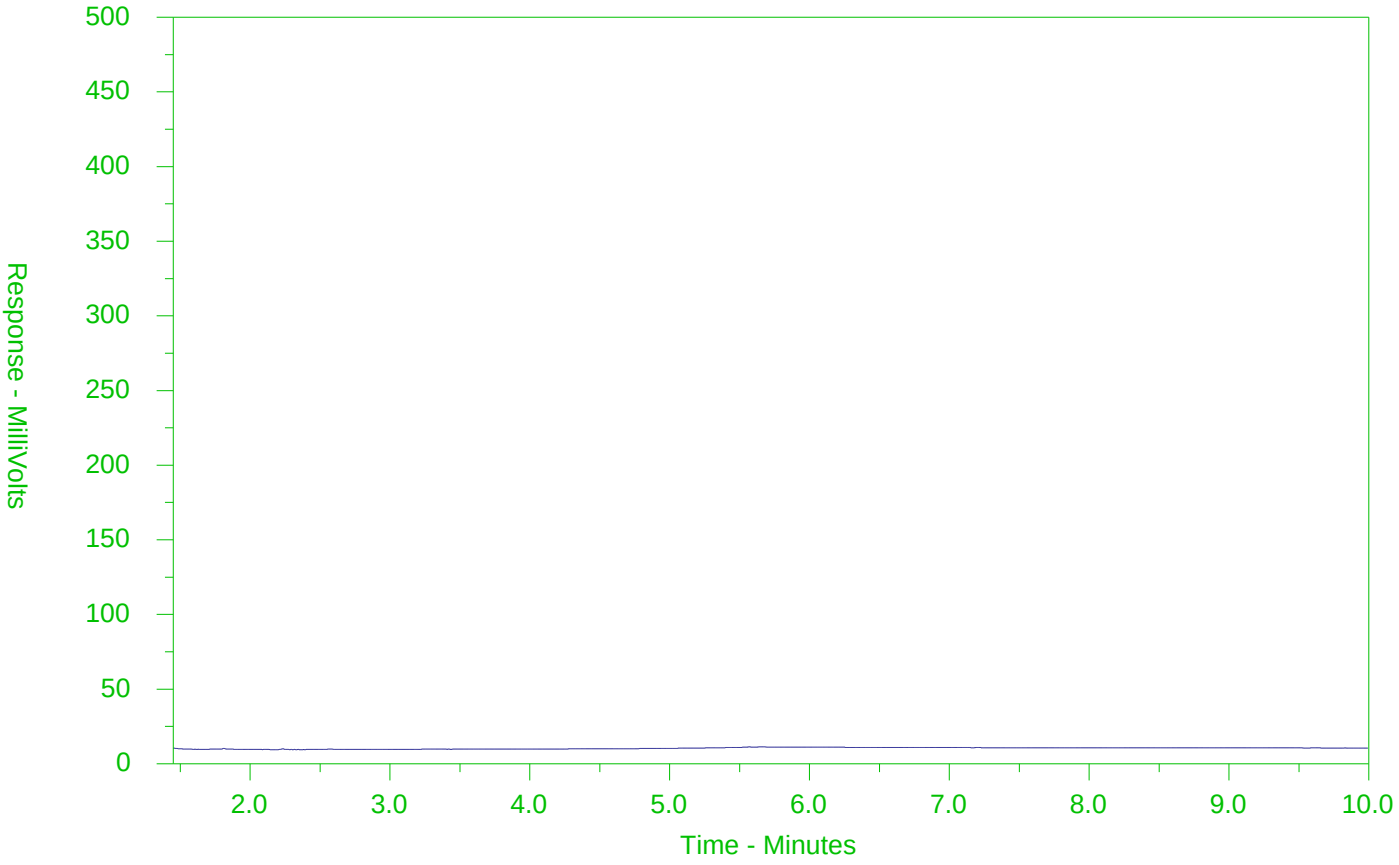
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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: L2105017-3
Client Sample ID: GW-11149990-060118-TW-016



←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

L2105017-COFC

COC Number: 17 - 621916

Page 1 of 1

Report To — Contact and company name below will appear on the final report
- Company: GHD Limited Acct# 18791
- Contact: Jennifer Balkwill
- Phone: 519-884-0510
- Company address below will appear on the final report
- Street: 651 Colby Drive
- City/Province: Waterloo/Ontario
- Postal Code: N2V 1C2

Report Format / Distribution
- Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
- Quality Control (QC) Report with Report ☑ YES ☐ NO
- ☐ Compare Results to Criteria on Report - provide details below if box checked
- Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
- Email 1 or Fax: Jennifer.Balkwill@ghd.com
- Email 2: See PO
- Email 3:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)
- Regular [R] ☒ 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.

Invoice To
- Same as Report To ☑ YES ☐ NO
- Copy of Invoice with Report ☐ YES ☑ NO
- Company: GHD Limited
- Contact: Jennifer Balkwill

Invoice Distribution
- Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
- Email 1 or Fax: Jennifer Balkwill
- Email 2:

Project Information
- ALS Account # / Quote #:
- Job #: 11149990-04
- PO / AFE: 73511036-1
- LSD:

Oil and Gas Required Fields (client use)
- AFE/Cost Center:
- PO#:
- Major/Minor Code:
- Routing Code:
- Requisitioner:
- Location:

ALS Lab Work Order # (lab use only): L2105017 RK

ALS Contact: Rick H

Sampler: Tyler W

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	VOC,F1-F4	SVOCs	153 Mond I Pkg	Phenols-4AAP	Alk, TDS	TKN, TP	DOC	NH3	Anions3 (N2N3,SO4)	WT-CA-D,WT-MG-D,WT-FE-D	WT-MN-D	Hardness (Calc)	VOC,F1 (TripBlank)			Samples on Hold	Sample is hazardous (please provide further details)	Number of Containers
	GW-11149990-060118-TW-002	01-June-18	13:10	GW	X	X	X															10
	GW-11149990-060118-TW-015	↓	14:40	↓	X	X	X	X	X	X	X	X	X	X	X	X						12
	GW-11149990-060118-TW-016	↓	15:55	↓	X	X	X	X	X	X	X	X	X	X	X	X						12
	TB-11149990-060118-TW-002	↓	-	-													X					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)

All metals, Cr6+, Hg and DOC bottles are field filtered.

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: 9.6

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Tyler Williams	Date: 1-June-2018	Time: 19:00	Received by:	Date:	Time:	Received by: Ramneek	Date: June 01 2018	Time: 19:05 pm

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.

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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