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FirstGroup America

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

FINAL REPORT

1830 Trim Road, Ottawa, Ontario

1 August 2019

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ACRONYMS AND ABBREVIATIONS

°C	degree Celsius
µg/g	microgram per gram (1 µg/g is equivalent to 1 ppm)
ald	above local datum
APEC	Area of Potential Environmental Concern
Arcadis	Arcadis Canada Inc.
bgs	below ground surface
BH	borehole
BTEX	benzene, toluene, ethylbenzene, and xylene
CALA	Canadian Association for Laboratory Accreditation Inc.
CGM	combustible gas meter
COC	contaminant of concern
CSM	conceptual site model
EC	electrical conductivity
ESA	Environmental Site Assessment

F1 to F4	fraction 1 to fraction 4
FirstGroup	FirstGroup America, Inc.
FOC	fraction of organic carbon
FOI	freedom of information
GW	ground water
ICC	industrial/commercial/community
km	kilometres
K	hydraulic conductivity
L	litres
m	metres
mg/kg	milligrams per kilogram (1 mg/kg equivalent to 1 ppm)
MECP	Ministry of the Environment, Conservation and Parks
MW	monitoring well
PAH	polycyclic aromatic hydrocarbon
PCA	Potentially Contaminating Activity
PCB	polychlorinated biphenyl
PHC	petroleum hydrocarbon compound
PVC	polyvinyl chloride
ppm	parts per million
QA/QC	quality assurance/ quality control
QP	Qualified Person
RDL	reportable detection limits
RPD	relative percent difference
RPI	residential/parkland/institutional
RSC	Record of Site Condition
SAR	sodium adsorption ratio
SCC	Standards Council of Canada
SCS	Site Condition Standards
Site	1830 Trim Road, Ottawa, Ontario
TSSA	Technical Standards and Safety Authority
UST	underground storage tank
VOC	volatile organic compound

1 EXECUTIVE SUMMARY

Arcadis Canada Inc. (Arcadis) was retained by FirstGroup America, Inc. (FirstGroup) to conduct a Phase Two Environmental Site Assessment (ESA) of the property located at 1830 Trim Road, Ottawa, Ontario (Phase Two Property, the Site or the subject property). The Phase Two ESA was conducted on behalf of FirstGroup to prepare the Phase Two Property for potential sale and redevelopment.

The Phase Two Property is located on the west side of Trim Road, approximately 0.5 km northwest of the Trim Road and Innes Road intersection and is legally described as: “PIN 14531-0715(LT), PART LOT A, CON 9, PARTS 1-8, 50R-5951”. The Site occupies approximately 1.2 hectares and includes a parking lot and a school bus maintenance garage.

The Phase Two investigation followed from the Phase One ESA completed by Arcadis which identified thirteen Areas of Potential Environmental Concern (APEC) locations, listed as follows:

APEC 1 -The bus maintenance garage and wash bay area from multiple potential sources including: the use of lubricants, motor oils, grease and gear oils; the production of waste oils; the use of antifreeze and bus windshield wash fluid; the use of maintenance tools which may generate metal grindings/welding fumes; and replacement of vehicle tires;

APEC 2 -The bus maintenance garage and wash bay area from multiple potential sources including: the use of solvents for parts de-greasing;

APEC 3 -The bus maintenance garage exterior area sources including: the presence of solid waste bins and scrap metal dumpsters;

APEC 4 -The exterior bus service areas and parking lot due to the presence of a septic tank (sanitary);

APEC 5 -The exterior bus service areas and parking lot due to the presence of a former underground waste oil tank;

APEC 6 -The exterior bus service areas and parking lot due to the presence of an existing shop drain underground holding tank;

APEC 7 -The bus parking area due to the placement of gravel fill of unknown origin across the Site;

APEC 8 -The gravel parking lot due to parking lot maintenance, potentially including use and storage of road salt;

APEC 9 -The stockpile of excess topsoil fill in the northeast corner of property;

APEC 10 -The stockpile of excess granular fill located on the edge of the graveled area, near the gate;

APEC 11 -The area of the former diesel underground storage tanks formerly present in the yard, north of the maintenance garage building;

APEC 12 -The parking lot and grassed areas throughout the property, specifically from potential use of pesticides during historical agricultural operations; and,

APEC 13 -Presence of a ground transformer (circa 1990) located at the southeast corner of the site building.

A sampling and analysis plan was prepared in advance of the Phase Two ESA field work in order to assess all identified APECs and all contaminants of concern.

In February 2016, seventeen (17) boreholes (BH16-1 to BH16-17) were drilled under the supervision of Arcadis staff. Five (5) of the boreholes (BH16-1 to BH16-5) were outfitted with a monitoring well in order to further evaluate/delineate the type and extent of potential soil and ground water contamination.

Drilling and soil sampling took place over three days on February 9, 16 and 17, 2016. Soil samples were collected on a continuous basis, with each soil sample being screened for petroleum soil vapours. The screening results were used to aid in identifying samples for submission to the laboratory. Duplicate samples were collected and submitted in accordance with appropriate quality assurance/quality control (QA/QC) practices.

Ground water samples were collected on February 18, 2016, March 1 and 8, 2016. Before sampling, all monitoring wells were monitored by measuring ground water levels, collecting well headspace vapour

readings in advance of well purging. Groundwater sampling was delayed due to slow recharge rates in the native clay soils.

On May 12 and 13, 2016, fifteen (15) test pits were advanced across the Site with the use of a rubber-tired back hoe. Test pits were advanced to an approximate depth of 2 m below grade. The back hoe was also utilized and fifteen cuts were made into the large stockpile, for the purpose of collecting stockpile interior soil samples. Soil samples were collected from the bucket of the back hoe, when the desired depth was reached. The soil was examined for the types of soils present, evidence of staining, perceived presence of odours and any other unusual conditions.

In May 2017, supplemental shallow boreholes were drilled at ten (10) locations; of which nine (9) were outfitted as shallow depth monitoring wells. The boreholes were advanced using a Geoprobe drill rig equipped with direct push Lexan tube samplers and operated by Downing Drilling under the supervision of Arcadis personnel. One deep monitoring well was installed in August 2017 (BHMW17-11) using a Geoprobe drill rig operated by Downing Drilling under the supervision of Arcadis personnel.

In March 2018, supplemental deep boreholes were drilled at seven (7) locations and supplemental shallow hand dug boreholes at three (3) locations. The deep boreholes were advanced using a Geoprobe drill rig equipped with direct push Lexan tube samplers and operated by Strata Drilling under the supervision of Arcadis personnel. The hand dug boreholes were dug by Arcadis personnel.

There were no significant deviations from the Sampling Plan for the follow-up investigation with respect to the borehole and monitoring well locations and contaminants sampled and analyzed. Boreholes and monitoring wells were generally placed as proposed and advanced to the anticipated depths. Locations are illustrated in **Figure 3**. Representative samples for the parameters selected for analysis in the proposed work plan were collected and submitted for analysis.

Laboratory analysis results are found in Appendix D for soil, and in Appendix E for ground water. Elevated concentrations of cobalt and vanadium were encountered in both the upper 1.5 m soil horizon and also at depths greater than 1.5 m below ground surface (bgs). It was inferred that these elevated concentrations were related to natural background conditions, based on the multiple lines of evidence outlined in the body of this report.

In relation to the Ministry of the Environment and Climate Change (MECP) Table 6 Site Condition Standards (SCSs; potable groundwater standard applicable to a residential land use), isolated exceedances of barium were detected in surface soil at the BH16-6, BH16-11, TP16-4, TP16-5, TP16-11 and TP16-12 locations. Chromium exceeded the MECP Table 6 SCS in surface soil at the BH16-13 location. Elevated concentrations of cyanide were detected in the large topsoil stockpile present at the northeast corner of the property. Elevated F3 concentrations were reported in the sample collected from the small granular fill soil stockpile, located near the entrance gate (since removed for landfill disposal in July 2017). Electrical conductivity was observed to exceed the applicable Table 6 SCS from 0.30 m bgs to a maximum depth of 3.35 m bgs at 10 test pit and 10 borehole locations.

In comparison with the MECP Table 6 generic residential SCSs, no exceedances were observed in any soil samples for the following analytical parameters: polycyclic aromatic hydrocarbons (PAHs); volatile organic compounds (VOCs) (including benzene, toluene, ethylbenzene and xylenes (BTEX)); and pesticides. In comparison with the MECP Table 6 (shallow soils) residential SCSs, no exceedances were observed in any soil samples for VOCs (including BTEX).

In comparison with the MECP Table 6 residential SCS, no exceedances were observed in any ground water samples for the following analytical parameters: PAHs and pesticides. In comparison with the MECP Table 6 (shallow soils) residential SCS, no exceedances were observed in any ground water samples for the following analytical parameters: F1 to F4 PHCs; and VOCs (including BTEX). Chloride and uranium were observed in shallow ground water to exceed MECP Table 6 residential SCSs. These exceedances were delineated horizontally and vertically in ground water.

In summary, it is the opinion of the Qualified Person that contaminated soils and ground water are present at the Phase Two ESA property at concentrations above the applicable MECP Table 6 residential SCS. A risk assessment and/or remediation program should be completed, along with a review of recommended risk management measures, before preparation of a Record of Site Condition (RSC).

2 INTRODUCTION

Arcadis Canada Inc. (Arcadis) was retained by the FirstGroup America, Inc. (FirstGroup) to conduct a Phase Two Environmental Site Assessment (ESA) of the property located at 1830 Trim Road, Ottawa, Ontario. The subject property is shown on **Figure 1** and is referred to herein as "the Phase Two Property" or "the Site".

2.1 Site Description

The Phase Two Property is located at 1830 Trim Road in Ottawa, approximately 0.5 km northwest of the Trim Road and Innes Road intersection. The Site is approximately 1.2 hectares in size and is legally described as: "PIN 14531-0715(LT), PART LOT A, CON 9, PARTS 1-8, 50R-5951". The predominant features on the Site are a former school bus maintenance garage building in the southwest corner of the lot, and a gravel parking lot covering much of the remaining lot.

2.1.1 Site History

The Site was historically used for agricultural purposes prior to 1988. After sale of the property in 1988 to Laidlaw Transit Limited, the subject property was then developed as a bus garage and bus maintenance facility, including a garage building and bus parking area. The bus maintenance operations terminated in approximately 2012. The Site has remained dormant since that time.

2.1.2 Adjacent Properties

The Phase Two Property is bounded by Trim Road to the northeast, a hydro corridor to the northwest and by a residential neighbourhood to the south. Lands further to the east and south, beyond the current limits of residential development appear to be predominantly used for agricultural purposes. The nearest waterbodies to the Site are the Ottawa River located approximately 3.5 km to the north and an L-shaped storm water management pond, located approximately 430 m northwest of the Site. The storm water pond is operated by the City of Ottawa. The pond appears to collect overflow from Cardinal Creek, located approximately 670 m northwest of the Site, and discharge into a sewer, which is located at the closest point to the Site.

Topographic mapping indicates the presence of ephemeral ditches on and adjacent to the site and directly across Trim Road. As these ditches are seasonal in nature and contain water only during significant stormwater events, these were not classified as water bodies for purposes of the Phase Two ESA.

2.2 Property Ownership

FirstGroup owned the Phase Two Property at the time this report was drafted.

Contact information for FirstGroup is as follows:

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2.3 Current and Proposed Future Uses

The Site was used as a school bus parking area and as a school bus maintenance garage until 2012. It is relatively flat with a 40 m x 25 m concrete block garage and attached office building in the southwest corner of the property. Approximately 1/3 of the property area consist of grass. The eastern third of the property is vegetated with grasses and shrubs and does not appear to have been used in the operations of the maintenance facility. A raised mound which appears graded and which may comprise a stockpile of topsoil fill from some unknown source is visible in satellite imagery at the north end of the property. The remainder of the property is gravel surfaced and was used for school bus access/ egress and parking.

It is proposed to demolish the school bus maintenance garage and office building and redevelop the property for residential uses.

2.4 Applicable Site Condition Standard

The site condition standards (SCSs) for use in evaluating soil and ground water conditions at the Site were selected from the Ministry of the Environment and Climate Change (MECP) "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*" dated April 15, 2011 (MECP, 2011a) using the approach prescribed by Ontario Regulation 153/04 (O. Reg. 153/04, as amended). The following site-specific information was used to select the SCS for use at the Site:

- The property is not an environmentally sensitive area since (with reference to O.Reg. 153/04; Section 41 and 43.1):

  - The pH of on-site soils are found within the range of 5 to 9;

  - The Site is not within an area of natural significance, nor does it include or is it adjacent to an area of natural significance, nor does it include lands that are within 30 m of an area of natural significance (O.Reg. Section 41);

  - The Site is not considered a “shallow soil property” as more than two thirds of the property has more than 2 m of overburden (O.Reg. Section 43.1);

- The surrounding area is serviced by a municipal drinking water system which in turn obtains water from the Ottawa River. However, based on records from the City of Ottawa, at least four neighboring properties could possibly remain on private drinking water wells located within 250 m of the site: 777, 793 and 805 Safari Court as well as at 1869 Trim Road. A summary of potable wells found within the Study Area was provided in Table 10 of the Phase One ESA report by Arcadis. For reference, this table is also included in **Appendix F** of this report;

- The Site is currently under commercial land use (but is proposed to be redeveloped as a residential land use);

- Soil is classified as medium to fine textured based on the results of field observations made during the field program and the results of grain size analyses completed on several soil samples.

One drinking water well was formerly present on the Phase Two ESA property. This drinking water well was decommissioned under the supervision of Arcadis staff in September 2016. This well was not used by former bus maintenance staff for drinking water but for vehicle wash water and plumbing/toilet uses only. Bottled water was supplied to the facility for drinking purposes when it was under operation.

Based on the above information, the applicable generic SCSs selected for use at the Site as it exists correspond to the generic SCSs for industrial/commercial/community (ICC) property use and medium/fine textured soil in a potable ground water condition (i.e. the MECP Table 2 ICC SCSs; MECP, 2011a). However, as the Site is to be redeveloped for a residential land use, comparison was made to the MECP Table 6 (potable groundwater) residential/parkland/institutional (RPI) SCSs.

Note that, as the ground water table was found to be relatively shallow at less than 3 m depth, reference was also made to MECP Table 6 (potable) SCSs, as required by O.Reg. 153/04, to evaluate petroleum hydrocarbon compound (PHC) fractions F1 and F2, volatile organic compounds (VOCs) and benzene, toluene, ethylbenzene and xylenes (BTEX) contaminants in both soil and ground water.

As is required under O.Reg. 153/04, a letter from the Clerk at the City of Ottawa was requested in order to validate the use of a potable ground water condition. A copy of the letter from the City of Ottawa is included in **Appendix A.** The letter from the City indicated that potable groundwater condition was recommended for use at the Phase Two property due to the presence of at least four neighboring properties having private drinking water wells located within 250 m of the site: 777, 793 and 805 Safari Court and 1869 Trim Road. A summary of potable wells found within the Study Area was provided in the Phase One ESA report by Arcadis.

3 BACKGROUND INFORMATION

The Site, which was formerly operated as a school bus maintenance garage with offices, includes the following infrastructure: a main office building with attached school bus maintenance garage, a holding tank for shop drains, a septic waste system and a school bus parking lot (**Figures 3 and 4**). Formerly, a propane tank area was present in addition to a former fuel island and dispenser with connecting former underground diesel storage tanks (USTs) as well as a former waste oil UST. The fuel island, diesel fuel USTs and waste oil UST were removed in 2015.

3.1 Physical Setting

The Phase Two Property is located in the Cumberland Township area of the Ottawa Valley. It is located in the physiographic region of Southern Ontario known as the St-Lawrence Lowlands, as delineated in The Atlas of Canada (Natural Resources Canada, atlas.gc.ca, 2006 – Canada Physiographic Regions Map). The Lowlands are characterized by plain-like areas. They were affected by the Pleistocene Glaciation and the subsequent Champlain Sea which was fed by the retreating glaciers. The St-Lawrence Lowlands are covered by surficial deposits, consisting mostly of pulverized rock and other fine Geological material, and features associated with glaciers.

The surficial geology observed at the subject property consists of mottled and laminated reddish-brown to blueish grey silty-clay and clay sediments deposited by the Champlain Sea that submerged the Lowlands following the Pleistocene Glaciation. The mass of this continental ice sheet had depressed the rock

beneath it below the sea level. Upon the retreat of the ice sheet, the ocean submerged the Saint-Lawrence and Ottawa River valleys.

According to Map 2140A, Surficial Geology of Lower Ottawa Valley, Ontario-Quebec, from the Geological Survey of Canada (St. Onge, D.A.), 2009, the Site is shown as underlain by offshore marine deposits. The marine deposit includes clay, silty clay, and silt, commonly calcareous and fossiliferous; locally overlain by thin sand. Upper parts are generally mottled or laminated reddish brown and bluish grey and may contain lenses and pockets of sand, but at depth the clay is uniform and bluish grey.

The soils up to 2.4 m below the ground surface are composed of reddish-brown silty clay and occasionally of fine sand lenses. At greater depth, the soils are very uniform and consist of blueish-grey clay with trace amount of silt. The lower blueish-grey clay soils are very uniform in nature with a natural water content which increases gradually with depth until exceeding the liquid limit.

The closest water bodies include the Ottawa River, located approximately 3.5 km to the north and a storm water pond located approximately 430 m northwest of the Site. It appears that overflow water flows from Cardinal Creek, located 670 m northwest of the Site, into the storm water pond, and discharges into the City of Ottawa sewer system. The topography of the Site can be described as gently sloping towards the northeast. There are drainage ditches surrounding the perimeter of the Site.

3.2 Past Investigations

Arcadis reviewed the previous reports relating to the subject property:

- *Tank Excavation Monitoring, First Student Canada* - # 31430, 1830 Trim Road Orleans, ON, K4A 3P8, Strata Environmental Project 1528465, dated 29 October 2015, prepared by Strata Environmental for FirstGroup America Inc.

- *Phase One Environmental Site Assessment*, 1830 Trim Road, Ottawa, Arcadis Canada Inc, Project number 450271-000; dated October 2017.

Arcadis was retained by FirstGroup to conduct a Phase One ESA of the property located at 1830 Trim Road, in Ottawa, Ontario. The activities undertaken as part of the Phase One ESA were identified and completed in accordance with O.Reg 153/04 (as amended by O.Reg. 511/09). The Phase One work scope included a review of the previous Strata Tank Excavation Monitoring report.

Strata Tank Excavation Monitoring Report

A summary of the report from Strata Environmental Services, Inc. (Strata) has been provided by the Technical Standards and Safety Authority (TSSA) as outlined in the TSSA letter found in **Appendix I**. In summary, on July 7, 2015, one (1) 2,270 L waste oil UST and two (2) diesel USTs (45,500 L size) were removed from the Site. Prior to removal, fluids in USTs were evacuated and the tanks were inverted to remove potentially explosive vapours. Approximately 1,104 L of the tank fluids were removed using a vacuum truck by Triangle Pump Services Limited and was transported off-site for recycling/disposal at the Triangle Pump Services Limited facility located at 2565 Delzotto Avenue in Gloucester, Ontario.

Two excavations were completed to remove the two diesel USTs and waste oil UST. It was reported that no ground water was observed in the excavations. Upon removal, the single-walled steel diesel USTs were observed to be in good condition with no surface corrosion, pitting or perforations apparent and were transported off-site to a metals recycling facility. The waste oil UST was fibreglass with no holes or openings observed.

Contaminated soil exhibiting vapour concentrations in excess of 5,000 parts per million (ppm) were encountered beneath the east half of the diesel UST excavation. This contaminated soil was characterized and classified with the results presented in the *"Waste Classification of Contaminated Soil*

Material, First Student Facility, 1830 Trim Road, Orleans, Ontario" report prepared by Strata, dated July 15, 2015. As presented in the report, petroleum constituents in excess of the applicable standards were detected in a representative sample of the contaminated soil. Waste classification indicated that the contaminated soil was deemed non-hazardous under Ontario Regulation 347/558. A total of 380.59 tonnes of contaminated soil were transported on August 11 and 12, 2015 to the GFL Environmental waste disposal facility located at 17335 Allaire Road in Moose Creek, Ontario.

Fourteen soil samples collected from the final limits of the diesel UST excavation were submitted to Caduceon Environmental Laboratories (Caduceon), an accredited laboratory for analysis of BTEX and PHC fractions F1 to F4. Selected soil samples were also analyzed for metals.

Fill material for tank excavation backfilling was obtained at the Lafarge Aggregate facility in Ottawa, Ontario. Five (5) samples were submitted to Caduceon for analysis of an array of parameter suites including VOCs, PHCs, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, electrical conductivity (EC), sodium adsorption ratio (SAR) and pH.

Strata selected the MECP (O. Reg. 153/04, as amended) Table 2 Full Depth Generic SCSs in a Non-Potable Ground Water Condition for ICC property use with medium to fine textured soil as being applicable for the Site. The residential land use standards were also selected for the Site due to a residential use within 30 m of the Site.

The 2015 confirmation sample data from Strata Environmental was added to the Phase Two CSM in the appropriate Section. For the Waste Oil UST tank having an approx. 31.1 m^2 bottom area, O.Reg.153/04 Table 3 requirements include 2 floor samples and 3 sidewall samples for >25m^2 but <50m^2 excavation floor area. Strata completed 2 floor samples (F1 and F2) and 3 sidewall samples (N1,7 & E1,7 & S1,3). For the two Diesel UST tank removal excavation, having an approx. 166.5 m^2 floor area- O.Reg. 153 Table 3 requirements include for >100 but <250m^2 floor area a requirement for 3 x excavation floor and 5 sidewall samples. Strata completed 4 floor samples (F2, F5, F7, and F11) and 7 sidewall samples (N1,12 & N3,4 & E3,4 & E1,8 & S4,6 & S2,8 & W1,8). All 2015 Strata sampling appears to meet O.Reg. 153/04 Table 3 excavation sampling and laboratory testing requirements.

Strata reported that the submitted soil samples from the final limits of excavations, segregated soil and imported fill met the SCSs with the exception of six (6) soil samples (T2-F1; T2-F2; T2-N1,7; T2-E1,7; T1-F11 and T1-F2) collected from the excavations walls. Vanadium and cobalt concentrations in these samples exceeded the Table 2 SCSs for residential property use. Strata reported that all six soil samples were collected from the native clay formation. All soil samples were devoid of visual and olfactory evidence of anthropogenic impact and none of the samples exhibited detected concentrations of organic constituents related to diesel or waste oil. Due to the absence of anthropogenic impacts in these samples, it was Strata's opinion that the elevated cobalt and vanadium concentrations are most likely a naturally occurring characteristic of the local clay formation.

Arcadis Phase One ESA

The purpose of the Arcadis Phase One ESA was to determine environmental conditions at the Site as the Site is currently for sale.

The Phase One ESA historical research included gathering and review of records that were related to both historical and current activities of the subject property and surrounding properties. This research included, but was not limited to, the review of fire insurance plans, topographic maps, city street directories, land titles information, and Ecolog ERIS environmental reporting which searches numerous federal, provincial, and private environmental databases. Arcadis also corresponded with the MECP and with the City of Ottawa for circulation of environmental information requests throughout various departments.

Information on the historic use of the property, as well as a preliminary understanding of underlying conditions was provided by FirstGroup, as documented in report prepared by Strata entitled: Tank Excavation Monitoring, First Student Canada - # 31430, 1830 Trim Road Orleans, ON (dated 29 October 2015).

Locations of underground fuel and waste oil storage tanks, aboveground storage tanks, salt bins, and areas of specific maintenance operations were detailed in the Strata report. This information was corroborated by site reconnaissance, as well as an interview and site escort from a person knowledgeable of historical and current site operations. The Strata report also detailed the removal of two 25,000 L diesel USTs and one waste oil UST.

Based on the Phase One ESA historical review, interviews, the Strata Environmental Report, and the 2015 Arcadis site reconnaissance, the following Areas of Potential Environmental Concern (APECs) were identified:

TABLE 3.1 – Areas of Potential Environmental Concern (APEC)

Area of Potential Environmental Concern (Figure 6)	Location of APEC on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminant of Potential Concern	Media Potentially Impacted
APEC 1	Inside Garage	PCA # 52, #4: Storage, maintenance, fueling, and repair of equipment, vehicles, and material used to maintain transportation systems and use of antifreeze. Including: a) Use of lubricants, motor oils, grease, and gear oils; b) Production of waste oils and presence of an oil-water separator; c) Use of antifreeze and bus windshield water fluids; d) Use of maintenance tools which may generate welding fumes and metal grindings; e) Replacement of vehicle tires	On-Site	VOCs, PHCs, metals and inorganics, PAHs, Glycol	Soil and/or Ground Water
APEC 2	Inside Bus maintenance garage services; Parts de-greasing next to maintenance pit	Use of solvents for parts de-greasing; PCA#51: Solvent Manufacturing, Processing and Bulk Storage a) Presence of 60L manual parts wash station	On-Site	VOCs, metals	Soil and/or Ground Water
APEC 3	Outside west end of garage building	PCA #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners a) Solid waste and scrap metal dumpsters	On-Site	Metals	Soil and/or Ground Water
APEC 4	At Septic Holding tank	PCA #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of	On-Site	VOCs, PHCs, PAHs, metals	Soil and/or groundwater

Area of Potential Environmental Concern (Figure 6)	Location of APEC on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminant of Potential Concern	Media Potentially Impacted
		waste, other than use of biosoils as soil conditioners a) presence of septic holding tank.			
APEC 5	North side of garage at Former Waste Oil tank	PCA #28: Gasoline and Associated Products Storage in Fixed Tanks a) 2,270 L was oil UST removed in 2015	On-Site	VOCs, PHCs,	Soil and/or Ground Water
APEC 6	North side of garage at shop drains holding tank	PCA #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners a) Presence of holding tank for shop drain lines.	On-Site	VOCs, PHCs, metals	Soil and/or Ground Water
APEC 7	Gravel parking lot area	PCA #30 – Importation of fill of unknown origin a) Bus parking area and circulation roadway provided with gravel fill surfacing of unknown origin.	On-Site	Metals, inorganics	Soil and/or Ground Water
APEC 8	Gravel parking lot area -use of road salt	PCA (no code) - Application of Road Salt a) Use of road de-icing salt on gravel parking lot. b) 2 X Former Salt Bins	On-Site	Cl / Na, metals EC/ SAR	Soil and/or Ground Water
APEC 9	Small stockpile of excess gravel, near entrance gate	PCA #30 – Importation of fill material of unknown quality. a) Gravel fill pile (removed in 2017)	On-Site	PHCs, metals	Soil and/or Ground Water
APEC 10	Large topsoil stockpile, northeast property corner	PCA # (no code)– native topsoil stockpile with elevated cyanide concentrations. a) Uncharacterized native topsoil stockpile with elevated cyanide concentrations.	On-Site	Cyanide,	Soil and/or Ground Water

Area of Potential Environmental Concern (Figure 6)	Location of APEC on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminant of Potential Concern	Media Potentially Impacted
APEC 11	Former pump island and 2x diesel USTs	PCA #28 – Gasoline and associated products stored in fixed tanks a) 2 x former diesel USTs (removed in 2015)	On-Site	VOCs, PHCs, PAHS	Soil and/or Ground Water
APEC 12	Parking lot and grassed areas within Property Boundary	PCA #40 – Pesticides (including Herbicides, Fungicides, and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage, and Large-Scale Application. a) Potential historical use of pesticides on agricultural lands prior to 1987.	On-Site	Pesticides	Soil and/or Ground Water
APEC 13	Ground Transformer (dry)	PCA #55 – PCBs.	On-Site	PCBs	Soil

All APECs are illustrated in **Figure 6**.

4 SCOPE OF THE INVESTIGATION

4.1 Overview of Site Investigation

The land use has been proposed to change from a commercial/industrial use to a residential land use.

The scope of work required to characterize site conditions and to identify environmental liabilities was developed following review of historical aerial photographs, a site inspection, and interviews with site personnel. The scope of investigation that was carried out during the course of the Phase Two ESA at the Site involved the determination of subsurface soil and ground water conditions at the Site, followed by an evaluation of the findings of the field and laboratory testing program to describe environmental liabilities attending the Site. These will be used to recommend and conduct appropriate remediation/risk management activities on the Site.

The field investigation and engineering work carried out during the investigation program and environmental quality evaluation process involved:

- Reviewing the previous Arcadis Phase One ESA data (air photos, Ecolog ERIS reporting, TSSA data, historical fire insurance plans/reports, Freedom of Information (FOI) requests to City of Ottawa and the MECP and interviews along with a site reconnaissance in order to properly place boreholes;

In February 2016:

- Undertaking a borehole exploration program and installing monitoring wells on the property in February 2016 at the locations as outlined in the *Sampling and Analysis Plan* prepared by Arcadis, dated 4 February 2016;

- Analyzing selected soil samples collected from the boreholes for pH, grain size analysis, the presence of BTEX, PHC F1 to F4, PAHs, VOCs, pesticides, inorganics and heavy metal contaminants;

- Analyzing ground water samples collected from the monitoring wells installed in 2016 for PHCs, PAHs, VOCs, glycol and heavy metal contaminants in addition to pH and phenols;

- Comparing the results of the chemical analyses against the provincial SCSs established by the MECP provided in Table 6 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act for a residential land use;

In May 2016:

- Undertaking a follow-up test pit investigation in May 2016 to further investigate and delineate the areas of concern noted following the first borehole exploration program (as described in the Follow-up Sampling Plan, dated May 2016);

- Analyzing selected soil samples collected from the test pits for grain size, EC, barium, chromium, vanadium, cobalt, fraction of organic carbon (FOC) and/or cyanide;

- Comparing the results of the chemical analyses against the provincial SCSs established by the MECP provided in Table 6 of Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act for a residential land use;

In May - August 2017:

- Undertaking a second follow-up borehole and monitoring well installation program in May and August 2017 to address MECP Pre-Submission Form (PSF) comments (provided in **Appendix I**) and to further investigate and delineate the areas of concern noted following the previous borehole/ test-pit exploration programs (as described in the Arcadis's *Sampling and Analysis Plan*, dated 4 April 2017);

- Analyzing selected soil samples collected from the boreholes for the presence of BTEX, PHC F1 to F4, metals & inorganics, free cyanide and electrical conductivity;

- Submittal of a soil sample for a Toxicity Characteristic Leaching Procedure (TCLP);

- Analyzing ground water samples collected from the monitoring wells installed in 2017 for BTEX, PHC F1 to F4, chloride, glycol, free cyanide, and uranium;

In March 2018

- Undertaking a third follow-up borehole drilling program in March 2018 to address MECP Pre-Submission Form (PSF) comments (provided in **Appendix I**) and to further investigate and delineate the areas of concern noted following the previous borehole/ test-pit exploration programs (as described in the Arcadis's *Sampling and Analysis Plan*, dated February 2018);

- Analyzing selected soil samples collected from the boreholes for the presence of PHC F1 to F4, PCB's, free cyanide, vanadium and electrical conductivity and testing for grain size;

- Preparing a report containing the results of the field and laboratory testing programs, as well as an evaluation of the potential environmental liabilities attending the Site and recommendations; and,

- Issuing a Phase Two ESA report detailing the investigation and remediation activities and their results, in accordance with the Schedule E of O.Reg. 153/04, as amended.

The intrusive investigation, sampling, and laboratory analysis was completed in accordance with the proposed Sampling & Analysis plan (dated February 4, 2016) and the Follow-up Sampling Plans (dated May 2016, 4 April 2017 and 8 February 2018). Copies of the Sampling & Analysis Plan and the Follow-up Sampling Plans for the Phase Two ESA are presented in **Appendix A**.

4.2 Media Investigated

The media investigated included soil and ground water. The decision to investigate both media was based on a detailed review of data identifying potential contaminants identified during the previous Phase One ESA, as reported by Arcadis in October 2017.

Initial soil sampling (February 2016) was undertaken to assess potential contaminant concentrations and determine the presence or absence of contamination. Selected samples from the boreholes were submitted for analysis for a broad range of contaminants including metals and inorganics, PAHs, VOCs, BTEX compounds, and PHC F1 to F4.

Subsequent soil sample collection (May 2016) was undertaken to delineate and confirm shallow soil contaminant concentrations identified during the February 2016 sampling program. Samples from test pits were submitted for analysis of grain size, EC, barium, chromium, vanadium, cobalt, FOC and/or cyanide.

Two stockpiles were identified on the property. Stockpile volumes were estimated and soil samples were collected from each stockpile, as per O.Reg. 153/04. Samples were analyzed for metals and inorganics, PAHs, VOCs, BTEX compounds, PHC F1 to F4 and/or pesticides.

Ground water quality was investigated at five monitoring wells installed by Arcadis. The purpose of the ground water investigation program was to identify any potential contaminant concentrations, confirm ground water flow direction and determine the potential for off-site migration of contaminants. Ground water samples were submitted for analysis for metals, PHCs, VOCs, BTEX, and PAHs.

Following field work in 2016, Arcadis submitted a Pre-Submission Form (PSF) to the MECP. The MECP provided comments to Arcadis in March 2017 related to our PSF submission of October 2016. Arcadis proceeded with an additional field sampling program in May and August 2017 and March 2018 to be able to provide a response to questions posed by the MECP. Soil samples from new boreholes and newly installed monitoring wells were submitted for testing of grain size and analysis of BTEX, PHC F1 to F4, metals & inorganics, free cyanide and electrical conductivity as well as uranium, chlorides and glycol in groundwater.

Please refer to the Borehole Rationale table provided within the *Sampling and Analysis Plan* in **Appendix A**.

4.3 Phase One Conceptual Site Model

A Conceptual Site Model (CSM) was created during the Phase One ESA and described the potential for loss of solvents, metals and petroleum hydrocarbons during the servicing of automotive vehicles in addition to the evaluation of the potential for contamination derived from historical on-site and adjacent land uses.

The locations of the Potentially Contaminating Activities (PCAs) and APECs, as determined through completion of the Phase One ESA, are shown on **Figure 6**.

A Phase One ESA site reconnaissance was completed on the property in February 2016 and available information was collected and reviewed. The sources of this information included historical records (aerial photographs, fire insurance plans, land registry documents and historic environmental reports), accessing numerous public and private databases and interviews with persons knowledgeable of the property. Additional Phase One ESA background information was received in September 2017 with respect to Source Protection Areas and cessation dates for former site occupancies. All of the above information was reviewed and compiled in this report and it has been concluded that the Phase One CSM remains valid.

4.4 Deviations from Sampling and Analysis Plan

4.4.1 February 2016

There were no significant deviations from the proposed sampling and analytical program with respect to the borehole locations and contaminants sampled and analyzed. Boreholes and monitoring wells were generally placed as proposed and drilled to the anticipated depths. Locations are illustrated in **Figure 3**. Representative samples for the parameters selected for analysis in the proposed work plan were collected and submitted for analysis. In 2016, a total of 17 boreholes were advanced; of which five were outfitted as monitoring wells. The boreholes were advanced using a Geoprobe drill rig equipped with direct push Lexan tube samplers and operated by Downing Drilling under the supervision of Arcadis personnel.

One borehole (BH16-5) was to be advanced on the west side of the maintenance pit, located inside the site maintenance garage building. Due to the tight working constraints and the presence of underground electrical utilities, no borehole could be advanced on the west side of the maintenance pit. The borehole was moved to the east side of the pit where access was possible, and the locations of potential buried utilities were cleared.

Borehole BH16-8 was to be placed slightly further south but the presence of a large tree in the intended sampling location meant that the actual drilling was undertaken slightly north of the intended spot.

Boreholes BH16-7 and BH16-12 were relocated a few metres to the west of their proposed location in order to avoid being placed directly below high voltage electrical transmission lines within the Hydro transmission corridor.

Samples were added to the program to provide more information about the Site. The pH levels were determined in almost every soil sample submitted for inorganics analysis. Several samples were composited to secure a sufficient sample quantity to run grain size analysis for purposes of site classification. The grain size samples were acquired from BH16-5-1, BH16-11-1, and BH16-13-1.

At the time of the creation of the *Sampling and Analysis Plan*, it was known that the previous Strata report had indicated exceedances found at depth for various metals. As such, it was inferred that the use of the Table 5 Stratified approach may be necessary. However, following a review of the Phase Two ESA laboratory results, it was noted that elevated metals (cobalt and vanadium) were encountered in both surficial overburden and in underlying soils at depths greater than 1.5 m below grade which rendered use of Table 5 standards impractical. The use of generic MECP 6 SCSs was chosen as applicable to site conditions.

4.4.2 May 2016

A total of fifteen (15) test pits were advanced using a backhoe supplied by M.Yelle Excavation under the supervision of Arcadis staff. Test pit locations are illustrated in **Figure 3**.

There were no significant deviations from the Sampling Plan for the follow-up investigation with respect to the test pit locations and contaminants sampled and analyzed. Test pits were generally placed as proposed and advanced to the anticipated depths.

Representative samples for the parameters selected for analysis in the proposed work plan were collected and submitted for analysis.

The requirement in O. Reg 153/04 for FOC indicates that samples must be collected from native soil in the upper 0.5 m. At the Trim Road Site, the upper 0.5 m consists of fill material at all locations. It was decided to collect a minimum of four samples from fill material in the upper 0.5 m, as well as four samples of the uppermost native material (from a depth of approximately 1 m).

An additional two test pits were advanced into the large topsoil stockpile. Soil samples were collected from the native underlying material (i.e. not the stockpiled material). Although described in the Follow-up Sampling Plan, these test pits were not specifically listed in the original sampling plan table.

4.4.3 May and August 2017

In May 2017, shallow boreholes were drilled at ten (10) locations; of which nine (9) were outfitted as shallow depth monitoring wells. The boreholes were advanced using a Geoprobe drill rig equipped with direct push Lexan tube samplers and operated by Strata Drilling under the supervision of Arcadis personnel. One deep monitoring well was installed in August 2017 (BHMW17-11) using a truck-mounted drill rig operated by Downing Drilling under the supervision of Arcadis personnel.

There were no significant deviations from the Sampling Plan for the follow-up investigation with respect to the borehole and monitoring well locations and contaminants sampled and analyzed. Boreholes and monitoring wells were generally placed as proposed and advanced to the anticipated depths. Locations are illustrated in **Figure 3**. Representative samples for the parameters selected for analysis in the proposed work plan were collected and submitted for analysis.

4.4.4 March 2018

In March 2018, three (3) boreholes were hand dug and seven (7) deep boreholes were drilled. The boreholes were advanced using a Geoprobe drill rig equipped with direct push Lexan tube samplers and operated by Strata Drilling under the supervision of Arcadis personnel.

There were no significant deviations from the Sampling Plan for the follow-up investigation with respect to the borehole locations and contaminants sampled and analyzed. Boreholes were placed as proposed and advanced to the anticipated depths. Locations are illustrated in **Figure 3**. Representative samples for the parameters selected for analysis in the proposed work plan were collected and submitted for analysis.

4.5 Impediments

The location of borehole BH16-8 (February 2016) was modified slightly as a mature tree was found in the proposed location for this borehole. Frost penetration in soils hampered the drilling activity timelines. The Site was snow-covered during the Phase Two ESA borehole drilling occurring in February 2016.

Borehole (BH16-5) was to be advanced on the west side of the maintenance pit, located inside the site maintenance garage building. Due to the tight working constraints and the presence of underground electrical utilities, no borehole could be advanced on the west side of the maintenance pit. The borehole

was moved to the east side of the pit where access was possible, and the locations of potential buried utilities were cleared.

The native site clays were extremely slow in re-charge rates and caused delays in securing groundwater samples during the Phase Two ESA field program.

No other significant impediments caused any deviations in the Phase Two ESA sampling program.

5 INVESTIGATION METHOD

5.1 General

Prior to initiating intrusive operations, the proposed locations of the boreholes and test pits were determined to be clear of interference with underground utilities, using the services of one or more of: Multiview, USL-1, the City of Ottawa; Public Works Department, Ottawa Hydro, Hydro One, Rogers cable and Bell cable. The staff from Multiview cleared each pre-marked borehole/test pit location prior to Phase Two ESA drilling on February 4, 2016 and on May 9, 2016 for the additional test-pitting occurring on May 12, 2016. Staff from USL-1 cleared each pre-marked borehole location prior to drilling on May 9, 2017, August 18, 2017 and March 9 and 13, 2018.

5.2 Drilling 2016

In February 2016, seventeen (17) boreholes were drilled on the Site, with five (BH16-1 to BH16-5) outfitted as monitoring wells under the supervision of Arcadis staff. The entire drill program was conducted by George Downing Estate Drilling Ltd. using a CME55 track-mounted drill rig on February 09, a Geoprobe 7822DT on February 16, and a Geoprobe 6620DT on February 17, 2016. Augers were cleaned after each borehole. Split spoon samplers were washed with detergent and rinsed with clean water after each sample. Excess soil cuttings were mounded beside each of the boreholes. Purge water was disposed of into the sump inside the building on May 9, 2016. The Geoprobe drilling operations utilized disposable Lexan liners of 1.2 m length for purposes of soil collection.

Five (5) of the boreholes (BH16-1 to BH16-5) were outfitted with a monitoring well in order to further evaluate/delineate the type and extent of potential soil and ground water contamination.

Soil samples were collected on a continuous basis, with each soil sample being screened for petroleum soil vapours. The screening results were used to aid in identifying samples for submission to the laboratory. Duplicate samples were collected and submitted in accordance with appropriate quality assurance/quality control (QA/QC) practices.

Ground water samples were collected on February 18, 2016, March 1, and 8, 2016. Before sampling, all monitoring wells were monitored by measuring ground water levels and collecting well headspace vapour readings as well as thorough purging of well contents.

5.3 Test-pitting 2016

On May 12, 2016, fifteen (15) test pits (TP16-1 to TP16-15) were advanced across the Site with the use of a rubber-tired back hoe, equipment and operator provided by Maurice Yelle Ltd. The test pit locations, also indicated on **Figure 3**, were selected to further delineate the contaminants of concern in shallow soils (i.e. EC, free cyanide, barium, and chromium).

Test pits were advanced to an approximate depth of 2 m, and backfilled upon completion.

Surface, and in some cases, subsurface soil samples (20 and 9 samples, respectively) were collected from each test pit, for a total of 29 samples. Subsurface soil samples were placed on hold at the laboratory, pending results of the surface soil samples. Test-pit samples were analyzed for electrical conductivity (EC), free cyanide, barium, chromium, cobalt, and vanadium, as these were identified as contaminants of concern during the earlier Phase Two investigation.

Three duplicate samples were collected and submitted in accordance with appropriate QA/QC practices.

Also on May 12, 2016, fifteen (15) samples and two (2) duplicates were collected from the large topsoil stockpile, located on the northeast side of the Site. Locations were selected around the stockpile to give good representation of the soil quality. Stockpile samples were analyzed for cyanide, as this was identified as the contaminant of concern within the topsoil during the earlier Phase Two investigation. Topsoil sample locations were numbered as soil samples SP101 to SP115. Duplicate soil samples were collected, as required under O.Reg. 153/04. Stockpile sampling was conducted in accordance with O.Reg. 153/04.

During the May 2016 investigation, the second small granular fill stockpile, designed as APEC 9 (see **Figure 6**) was estimated to be 45 m^3 in volume. One soil sample and one duplicate were collected on May 13, 2016 and analyzed for PHCs F1 to F4, PAHs, VOCs, metals and inorganics and pesticides.

5.4 Drilling 2017

To address MECP comments following from Arcadis's PSF submission, ten (10) boreholes were drilled on May 9, 2017. Nine of the ten boreholes were outfitted as monitoring wells (BH/MW17-1 to BH/MW17-9). This drilling program was conducted by Strata Drilling using a Geoprobe 7822DT track-mounted drill rig. The Geoprobe drilling operations utilized disposable Lexan liners of 1.2 m length for purposes of soil collection. Excess soil cuttings were mounded beside the boreholes. Purge water was disposed of into the

shop drains sump inside the building on 25 August 2017. Soil and ground water duplicates were collected, as required under O.Reg. 153/04.

On August 18, 2017, one (1) monitoring well was installed (BH/MW17-11). The installation of this monitoring well was conducted by Downing Drilling using a truck mounted drill rig. This 7.12 metre depth well was installed to provide vertical delineation of chloride and uranium contaminants in groundwater.

The 2016 and 2017 borehole and monitoring well locations, shown on **Figure 3**, were selected to evaluate possible contamination issues identified during the site reconnaissance and to provide soil and ground water samples representing, as best as possible, a cross-section of the Site. The location and selection rationale for each of the boreholes advanced is provided within the Sampling and Analysis Plans provided in **Appendix A**.

Soil samples were collected on a continuous basis, with each soil sample being screened for petroleum soil vapours. The screening results were used to aid in identifying samples for submission to the laboratory. Duplicate samples were collected and submitted in accordance with appropriate quality assurance/quality control (QA/QC) practices.

A grab sample was collected from the small stockpile of excess gravel fill for the submission of a Toxicity Characteristic Leaching Procedure (TCLP).

Ground water samples were collected on May 23 and 24, 2017, August 25 and November 1, 2017. Before sampling, all monitoring wells were monitored by measuring ground water levels and collecting well headspace vapour readings.

5.5 Drilling 2018

To address MECP comments following from Arcadis's PSF submission, seven (7) boreholes were drilled and three (3) boreholes were hand dug on March 13, 2018. This drilling program was conducted by Strata Drilling using a Geoprobe 7822DT track-mounted drill rig. The Geoprobe drilling operations utilized disposable Lexan liners of 1.2 m length for purposes of soil collection. Excess soil cuttings were mounded beside the boreholes. Soil duplicates were collected, as required under O.Reg. 153/04 and submitted in accordance with appropriate quality assurance/quality control (QA/QC) practices.

The 2018 borehole locations, shown on **Figure 3**, were selected to evaluate possible contamination issues identified during the site reconnaissance and to provide soil samples representing, as best as possible, a cross-section of the Site. The location and selection rationale for each of the boreholes advanced is provided within the Sampling and Analysis Plans provided in **Appendix A**.

A summary of the 2016 and 2017 drilling and test-pit program is provided in Tables 5.1 to 5.4.

Table 5.1: Field Work Conducted in February 2016

APEC	Borehole/ Monitoring Well	Location	Soil Analytes in Feb 2016	GW Analytes in Feb 2016
APEC 1	MW16-5	Inside Building (garage area)	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC	BTEX, PHC F1-F2, VOC, Metals, Inorganics, PAH
APEC 2	MW16-5	Inside Building (garage area)	VOCs, metals	VOC, Metals
APEC 3	BH16-9	Solid Waste Bins and Scrap Metal Dumpsters	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC	-
APEC 4	BH16-8	Septic tank	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC, PCBs	-
APEC 5	MW16-3	Underground Waste Oil Tank	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC
APEC 6	MW16-4	Holding Tank for Shop Drains	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC
APEC 7	BH16-6, BH16-10, BH16-11, BH16-14, BH16-16	Gravel Fill Parking Area	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC, FOC	-
APEC 8	MW16-1	Former Salt Bin and use of road salt	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC, PCBs
APEC 9	-	Small Gravel Stockpile	-	-
APEC 10	BH16-17	Large Excess Fill Stockpile	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC, PCBs	-
APEC 11	MW16-2	Former Diesel Underground Storage Tanks	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC
APEC 12	BH16-7, BH16-12, BH16-13, BH16-15	Parking Lot and Grassed Area Throughout Property	Metals, Inorganics, PAH, BTEX, PHC F1-F2, VOC, PCBs, FOC	-

Table 5.2: Field Work Conducted in May 2016 (Test Pit program)

APEC	Test Pit	Location	Soil Analytes in May 2016
APEC 7, APEC 8	TP16-1, TP16-2, TP16-3, TP16-4, TP16-5, TP16-6, TP16-7, TP16-8, TP16-9, TP16-10, TP16-11, TP16-12, TP16-13, TP16-14, TP16-15	Gravel Fill Parking Area, Parking Lot and Grassed Area Throughout Property	Barium, Chromium, EC, Cyanide, FOC, Grain Size (plus Cobalt, Vanadium at TP16-4, TP16-6, TP16-12)
APEC 9	SP201, SP202, SP203, SP204, SP205	Small Gravel Stockpile	PHCs, VOCs, metals, inorganics, PAHs and pesticides
APEC 10	SP101, SP102, SP103, SP104, SP105, SP106, SP107, SP108, SP109, SP110, SP111, SP112, SP113, SP114, SP115	Large Excess Topsoil Stockpile	Cyanide

Table 5.3: Field Work Conducted from May to November 2017

APEC	Borehole/ Monitoring Well	Location	Soil Analytes in May 2017	GW Analytes from May to November 2017
APEC 1	BH/MW17-1, BH/MW17-2 and MW16-4	Inside Building (Wash Bay and Garage)	BTEX, PHC F1-F2, VOC	Metals, BTEX, PHC F1-F2, Chloride, Cyanide, Glycol
APEC 2	BH/MW17-1	Inside Building (garage area)	BTEX, PHC F1-F2, VOC	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
APEC 4	BH/MW17-3	Septic tank	Metals & Inorganics, BTEX, PHC F1-F2, EC, Cyanide	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
APEC 5	BH/MW17-8	Underground Waste Oil Tank	BTEX, PHC F1-F2	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
APEC 6	BH/MW17-9	Holding Tank for Shop Drains	BTEX, PHC F1-F2	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
APEC 9	BH/MW17-7	Small Gravel Stockpile	BTEX, PHC F1-F2, EC, TCLP	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
APEC 10	BH/MW17-6	Large Excess Topsoil Stockpile	BTEX, PHC F1-F2, EC, Cyanide	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
APEC 11	BH/MW17-4	Former Diesel Underground Storage Tanks	BTEX, PHC F1-F2, EC	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
Background Condition	BH/MW17-5	Grassed Area	BTEX, PHC F1-F2, Cyanide, EC	Metals, BTEX, PHC F1-F2, Chloride, Cyanide
Fill depth verification	BH17-10	Verification of fill depths	none	None
Vertical GW Delineation	BH/MW17-11	Parking Lot beside Holding Tank for Shop Drains	-	Chloride, Uranium

Table 5.4: Field Work Conducted in March 2018

APEC	Borehole/ Monitoring Well	Location	Soil Analytes in March 2018
APEC 8	BH18-1 to BH18-4	Grassed Area	EC, grain size, vanadium
APEC 10	SP301, SP302, SP303	Underneath the Large Excess Topsoil Stockpile	Cyanide
APEC 13	BH18-5 to BH18-7	Transformer	PHC F1-F2, PCB's

5.6 Soil: Sampling

5.6.1 February 2016

Soil samples were collected on a continuous basis using either the track mounted CME55 rig or the Geoprobe track mounted drill rigs. Geoprobe soil samples were collected using the direct push method with plastic sleeve soil cores. The soil samples collected with the CME55 rig were secured using a standard split spoon sampling process. The standard spilt spoon soil cores or sleeve soil cores were, on being removed from the ground, examined for variations in soil type and colour, odours and any other unusual conditions. The results were immediately recorded on field logs.

For each split spoon or sleeve core, the field technician examined the soil to identify the type of soils present, evidence of staining, perceived presence of odours and any other unusual conditions. The results of the core inspections are documented on the individual borehole logs contained in **Appendix B**. The individual logs provide a profile of the soil stratigraphy encountered in each borehole.

The soil samples, including duplicates where required, were collected and placed into the appropriate-sized sample jars equipped with sealable lids, as supplied by the analytical laboratory. Representative samples from each split spoon were also placed into sterile plastic bags for purposes of soil hydrocarbon vapour screening using an RKI Eagle combustible gas meter (CGM). Samples were placed into coolers containing ice pending shipment to the laboratory. All QA/QC procedures, as outlined in Section 5.14, were followed during the field sampling work to ensure the integrity of the samples.

Summarized descriptions of the soil horizons encountered in the boreholes completed in the current investigation are provided in Table 7 (Section 6). The reader is cautioned that conditions between and beyond boreholes may vary. The depth to bedrock was not confirmed during any of the current drilling

operations. Generally, a sandy gravel to gravelly sand fill (along with a cement-like dust) was found beneath the surface across the Site which, in all cases, graded to a native clay. The clay strata was found to become softer and exhibit an increasing moisture content with depth.

A raised berm of vegetated topsoil was observed at the northeast corner of the Site. This elevated topsoil stockpile was sampled at the BH16-17 borehole location. A substantial thickness of organic topsoil was encountered at this location, exceeding 2.99 m in thickness in places. The MW16-17 borehole did not extend to intercept the inferred underlying native clay horizon.

5.6.2 May 2016

Soil samples were collected from the bucket of the back hoe, when the desired depth was reached. The field technician examined the soil to identify the types of soils present, evidence of staining, perceived presence of odours and any other unusual conditions. The results of these inspections are documented on the individual test pit logs contained in **Appendix B**. The individual logs provide a profile of the soil stratigraphy encountered in each test pit.

The soil samples, including duplicates where required, were collected and placed into the appropriate-sized sample jars equipped with sealable lids, as supplied by the analytical laboratory. No field screening was conducted. Samples were placed into coolers containing ice pending shipment to the laboratory. All QA/QC procedures, as outlined in Section 5.14, were followed during the field sampling work to ensure the integrity of the samples.

Two test pits (TP16-14 and TP16-15) were advanced through the bottom of the large topsoil stockpile. Two samples, one from each test pit, were collected from the soil material under the stockpiled material. Fifteen samples were collected from the stockpiled material itself, in accordance with O. Reg. 153/04. The back hoe cut into the side of the stockpile so that interior soil samples could be collected. The cuts were spaced around the stockpile, as illustrated in **Figures 9a and 9b**.

One sample was collected from the smaller on-site gravel fill stockpile. Hand tools were used to excavate into the stockpile. Five soil samples were collected from around the stockpile and field-screened for hydrocarbon vapours. The location of the sample with the highest vapour reading was selected as the location of the sample collected for laboratory analysis. A duplicate soil sample was also collected from this location.

5.6.3 May 2017

Soil samples were collected on a continuous basis using the Geoprobe track mounted drill rig. Geoprobe soil samples were collected using the direct push method with plastic sleeve soil cores. The plastic sleeve soil cores were, once being removed from the ground, examined for variations in soil type and colour, odours and any other unusual conditions. The results were immediately recorded on field logs.

For each sleeve core, the field technician examined the soil to identify the type of soils present, evidence of staining, perceived presence of odours and any other unusual conditions. The results of the core inspections are documented on the individual borehole logs contained in **Appendix B**. The individual logs provide a profile of the soil stratigraphy encountered in each borehole.

The soil samples, including duplicates where required, were collected and placed into the appropriate-sized sample jars equipped with sealable lids, as supplied by the analytical laboratory. Representative samples from each sleeve core were also placed into sterile plastic bags for purposes of soil hydrocarbon vapour screening using an RKI Eagle combustible gas meter (CGM). Samples were placed into coolers containing ice pending shipment to the laboratory. All QA/QC procedures, as outlined in Section 5.14, were followed during the field sampling work to ensure the integrity of the samples.

As required under the O.Reg. 153, VOC analysis protocols for soil samples the laboratory requires two 40 mL vials preserved with methanol for correct sample analysis. During drilling activities Arcadis personnel collected the two 40 mL methanol vials at sample locations BH17-1-2 and BH17-2-2 for VOC analysis. After the samples were submitted to the laboratory by Arcadis personnel an error occurred due to a mix up in sample entry by the laboratory staff. As a result the 40 mL methanol vials collected in the field by Arcadis personnel at sample locations BH17-1-2 and BH17-2-2 were used to analyze BTEX and PHC F1 compounds only. The remaining VOC analysis for samples BH17-1-2 and BH17-2-2 were completed using soil supplied to the laboratory from the additional 120 mL soil jars provided for moisture and PHC F2-F4 analysis. As a result the VOC analytical results (excluding the BTEX compounds) for soil samples BH17-1-2 and BH17-2-2 may be biased low.

A small gravel and soil stockpile is located near the entrance to the property. The gravel/soil from this stockpile was sampled for the testing of a Toxicity Characteristic Leaching Procedure (TCLP). Hand tools were used to sample from the stockpile.

A background sample (BH/MW17-5) was collected for the purpose of assessing inferred background conditions for cyanide and EC in soil and metals/inorganics in groundwater.

5.6.4 March 2018

Soil samples were collected using a shovel and a Geoprobe track mounted drill rig. Hand dug soil samples were collected in the vicinity of the electrical transformer. Geoprobe soil samples were collected using the direct push method with plastic sleeve soil cores. The plastic sleeve soil cores were, once being removed from the ground, examined for variations in soil type and colour, odours and any other unusual conditions. The results were immediately recorded on field logs.

For each sleeve core, the field technician examined the soil to identify the type of soils present, evidence of staining, perceived presence of odours and any other unusual conditions. The results of the core inspections are documented on the individual borehole logs contained in **Appendix B**. The individual logs provide a profile of the soil stratigraphy encountered in each borehole.

The soil samples, including duplicates where required, were collected and placed into the appropriate-sized sample jars equipped with sealable lids, as supplied by the analytical laboratory. Samples were placed into coolers containing ice pending shipment to the laboratory. All QA/QC procedures, as outlined in Section 5.14, were followed during the field sampling work to ensure the integrity of the samples.

Summarized descriptions of the soil horizons encountered in the boreholes completed during the 2016, 2017 and 2018 investigation are provided in Section 6, below. The reader is cautioned that conditions between and beyond boreholes may vary. The depth to bedrock was not confirmed during the Phase Two ESA drilling operations. An overview of the APECs investigated and the corresponding borehole and testpit locations is provided in Table 5.5.

Table 5.5 – Sample locations and corresponding APECs

Borehole/ Test Pit Locations	APECs investigated*
BHMW16-1	APEC 8
BHMW16-2	APEC 11
BHMW16-3	APEC 5
BHMW16-4	APEC 1, 6
BHMW16-5	APEC 1
BH16-6 (S corner)	APEC 7, 8, 12

BH16-7 (SW corner)	APEC 7, 8, 12
BH16-8 (east of bldg.)	APEC 4
BH16-9 (waste bins)	APEC 3
BH16-10 to BH16-14	APEC 7, 8, 12
BH16-15 & 16-16 (SE corner)	APEC 12
BH16-17 (topsoil stockpile)	APEC 10
TP16-1	APEC 12
TP16-2 to TP16-13	APEC 7, 8, 12
TP16-14 and TP16-15	APEC 10
BHMW17-1	APEC 2
BHMW17-2	APEC 1
BHMW17-3	APEC 4
BHMW17-4	APEC 8, 11
BHMW17-5	APEC 12
BHMW17-6	APEC 10
BHMW17-7	APEC 9
BHMW17-8	APEC 5
BHMW17-9	APEC 6
BH17-10	APEC 7,8
BHMW17-11	APEC 6
BH18-1 to BH18-4	APEC 8
BH18-5 to BH18-7	APEC 13
SP301 to SP303	APEC 10

* additional APECs may have been investigated through ground water sampling due to delineation requirements for other nearby APECs.

5.7 Field Screening Measurements

During the February 2016, May 2016, and May 2017 field work, all recovered soil samples were examined in the field for soil gas odours, and the results of this examination are shown on the individual borehole logs. Samples recovered during the test-pitting program were not field screened (PHCs were not a contaminant of concern), with some exceptions. The samples collected from the smaller granular fill stockpile (SP201 to SP205) were field screened for hydrocarbon vapours, as no previous sampling had been conducted within this small stockpile.

All soil samples recovered from each of the boreholes and small stockpile were tested for the presence of volatile soil gas vapours using an RKI Eagle CGM calibrated to hexane, in the methane elimination mode. The unit is designed to detect and measure concentrations of combustible gas.

The CGM unit can detect combustible vapours in both the 0-500 ppm range and 0-100% LEL. The instrument was used in the methane elimination mode, in order to eliminate responses due to methane.

The RKI Eagle CGM monitor was calibrated by the rental firm using a 0.44% by volume hexane gas concentration prior to the start of the field program. The monitor is also calibrated yearly, or more often if concerns arise, by the rental firm. The precision of the equipment is ±5 ppm or ±5%, depending on the operating mode. The accuracy is ±5%.

The soil vapour readings are shown on the individual borehole logs. Soil vapour readings were generally less than 10 ppm. All samples were less than 100 ppm; a value typically used as a potential alert level. The only elevated readings were encountered at BH16-1 (maximum of 60 ppm at 0.7 to 1.5 m bgs) and at BH17-1 (maximum of 20 ppm at 0.8 to 1.5 m bgs).

Each soil sample was screened for hydrocarbon vapours using the above CGM equipment. Soil CGM screening results were recorded on the borehole logs, contained in **Appendix B.**

5.8 Ground Water Monitoring Well Installation

During the 2016 field program, five (5) monitoring wells were installed at borehole locations BH16-1 to BH16-5 drilled by George Downing Drilling Ltd. with well screens typically starting at 1.5 m bgs. Split spoons and other non-dedicated equipment were washed with detergent and rinsed with clean water before reuse.

The wells were renamed as monitoring wells MW16-1 to MW16-5. Each well was constructed using 51 mm inside diameter, flush threaded, polyvinyl chloride (PVC) well screen and solid riser. Prior to well installation, silica sand was placed at the base of the boreholes. A 3 m long well screen was installed to intercept the water table and the well was completed to grade with solid riser. A clean, silica sand filter pack was placed in the borehole annulus around the well screen to approximately 0.15 m above the top of the screen. A bentonite seal was installed above the sand pack to approximately 0.3 m bgs to prevent infiltration of surface water in monitoring wells. The monitoring wells were completed at grade with flush mounted protective casings set in concrete. The monitoring wells were registered in accordance with Ontario Regulation 903 (O. Reg. 903, as amended).

Monitoring wells MW16-1 to MW16-4 were initially developed on February 9, 2016. The monitoring well installation at MW16-5 remained dry following installation and was returned to on February 16, 2016 for well development purposes. Sampling of the four other wells was completed on February 18, 2016. MW16-5 was revisited on March 1 and 8, 2016 to perform an initial purge and then allow sufficient time for recharge prior to sampling.

Due to the observed static water table approaching 0.5 m bgs and above the previous well screen tops, the site was returned to in May 2017 to install shallower monitoring wells; with screen tops commencing approximately 0.3 m bgs.

On 9 May 2017, nine monitoring wells BH/MW17-1 to BH/MW17-9 were installed. Each well was constructed using 51 mm inside diameter, flush threaded, polyvinyl chloride (PVC) well screen and solid riser. Prior to well installation, silica sand was placed at the base of the boreholes. A 3 m long well screen was installed to intercept the water table and the well was completed to grade with solid riser. A clean, silica sand filter pack was placed in the borehole annulus around the well screen to approximately 0.08 m above the top of the screen. A bentonite seal was installed just above the sand pack to prevent infiltration of surface water in monitoring wells. All nine wells were sampled on 23 or 24 May 2017.

On 18 August 2017, monitoring well BH/MW17-11 was installed. The well was constructed using 51 mm inside diameter, flush threaded, polyvinyl chloride (PVC) well screen and solid riser. Prior to well installation, silica sand was placed at the base of the borehole. A 10 m long well screen was installed to intercept the water table and the well was completed to grade with solid riser. A clean, silica sand filter pack was placed in the borehole annulus around the well screen to approximately 0.50 m above the top of the screen. A bentonite seal was installed above the sand pack to approximately 0.33 m bgs to prevent infiltration of surface water in monitoring wells. This well was sampled on 25 August and 1 November 2017.

All of the 2017 monitoring wells were completed with stick-up piping and all of the monitoring wells were registered in accordance with Ontario Regulation 903 (O. Reg. 903, as amended). Well construction details are as follows:

Table 5.6: Well Construction Details

Monitoring Well ID	Ground Elevation (m ald)	Depth to bottom of well (m bgs)	Screened Interval (m bgs)
MW16-1	99.434	4.426	1.5 - 4.5
MW16-2	99.506	4.606	1.5 - 4.6
MW16-3	99.672	4.409	1.5 - 4.4
MW16-4	99.690	4.342	1.5 - 4.5
MW16-5	99.996	4.551	1.5 - 4.6
BH/MW17-1	99.972	3.405	0.3 - 3.3
BH/MW17-2	99.966	3.426	0.3 - 3.3
BH/MW17-3	99.699	3.367	0.3 - 3.3
BH/MW17-4	99.505	3.384	0.3 - 3.3
BH/MW17-5	98.979	3.341	0.3 - 3.3
BH/MW17-6	98.976	3.028	0.3 - 3.3
BH/MW17-7	99.373	2.732	0.3 - 2.7
BH/MW17-8	99.737	3.232	0.3 - 3.3
BH/MW17-9	99.671	3.595	0.3 - 3.3
BH/MW17-11	99.671	7.670	3.9 - 7.62

The volume of the monitoring well was calculated by measuring the top and bottom of the water column. This volume was then removed three times, or until dry. The purged ground water from monitoring wells M!16-1 to MW16-5 was placed into 20 L plastic pails and was temporarily stored on the Site. It was later disposed of into the existing site wastewater holding tank system, via a floor drain inside the building on May 9, 2016 and August 25, 2017. A copy of the well record submitted to MECP is found in **Appendix F**.

5.9 Ground Water: Field Measurement of Water Quality Parameters

5.9.1 February 2016

Ground water was collected from the MW16-1 to MW16-5 following static water level measurements which were taken on February 18 and March 01, 2016. The well construction details are provided on the borehole logs in **Appendix B**.

In the winter of 2016, the depth to ground water ranged from 1.12 m bgs in monitoring well MW16-1 to 2.12 m bgs in monitoring well MW16-5. Ground water elevations ranged from 97.89 m above local datum (m ald) at monitoring well MW16-5 to 98.60 m ald at monitoring well MW16-3. Well purging details are found in table 5.7:

Table 5.7: Well Purging Details, 2016 Field Program

Monitoring Well ID	February 09, 2016		February 18, 2016		March 01, 2016	
	Water Level (m bgs)	Quantity Purged (L)	Water Level (m bgs)	Quantity Purged (L)	Water Level (m bgs)	Quantity Purged (L)
MW16-1	0.701	64 L	1.12	None	-	-
MW16-2	0.744	23 L	1.47	None	-	-
MW16-3	4.283	insufficient	1.17	25 L	-	-
MW16-4	3.918	4 L to dry	1.17	25 L	-	-
MW16-5	-	-	4.50	Insufficient	2.131	22 L

The purge water from all borehole locations was observed for turbidity and a determination of the presence of a sheen or odour. For MW16-1, the first 8 L consisted of clear water without sediments while 8 L to 64 L (to dry) was murky, brown, no sheen, no odour. For MW16-2, the first 5 L consisted of murky, brown water while purging beyond 5 L was clear, no to light sediment, no odour, no sheen. MW16-3 purge water was clear water, no sediment, no odour, no sheen. The purge water from the wells MW16-4, and MW16-5 were both clear, no to very light sediment, no sheen or odour.

For purposes of ground water contour plotting (**Figure 5A**), the interior building borehole (MW16-5) was not included in the contour evaluation as it was inferred that this well location, which was central to the building interior, would be prevented from receiving surface water recharge, especially during winter conditions, which may serve to depress the measured static water level ground water elevations, as encountered; especially since the native clay materials were noted to have a low hydraulic conductivity due to the observed slow well recharge rates.

5.9.2 May 2016

During the follow-up test-pit program, ground water levels were recorded in all pre-existing monitoring wells on May 9, 2016. In the spring, the depth to ground water ranged from 0.48 m bgs in monitoring well

MW16-05 to 0.81 m bgs in monitoring well MW16-03. Ground water elevations ranged from 98.82 m at monitoring well MW16-01 to 99.53 m at monitoring well MW16-5.

Ground water contours from the May 2016 data are illustrated in **Figure 5B**. As in **Figure 5A**, the interior building borehole (MW16-5) was not included in the contour evaluation.

To determine the hydraulic conductivity of the ground water, a slug test was conducted on MW16-2. The initial water level was recorded. Then water was purged from the well for one minute and re-charge rate was monitored. The final water level was recorded, as well as the subsequent recovery (over up to 70 minutes duration). Using the Hvorslev method, the normalized recovery was plotted versus time. The hydraulic conductivity, K, equal to the slope of the graph, was determined to be 2.7 x 10^{-5} m/s. The hydraulic conductivity test report is included in **Appendix C**.

5.9.3 May & August to November 2017

On 23 May 2017, ground water static levels were recorded at fifteen (15) monitoring wells containing sufficient water. Due to the low flow sampling method, fourteen wells were not purged (on 23 May 2016) prior to sampling. Ground water elevations ranged from 0.549 m below ground surface (m bgs) at monitoring well BH/MW17-7 to 4.150 m bgs at the deep monitoring well, BH/MW17-11. Well purging details are found in Table 5.8 below.

Table 5.8: Water Level Details, 2017 Field Program

Monitoring Well ID	May 23, 2017
	Water Level (m bgs)
MW16-1	0.598
MW16-2	0.569
MW16-3	0.887
MW16-4	0.723
MW16-5	1.416
BH/MW17-1	1.433
BH/MW17-2	1.396
BH/MW17-3	2.698
BH/MW17-4	1.630
BH/MW17-5	1.931

Monitoring Well ID	May 23, 2017
	Water Level (m bgs)
BH/MW17-6	1.700
BH/MW17-7	0.549
BH/MW17-8	1.061
BH/MW17-9	0.865
	August 25, 2017
BH/MW17-11	4.150
	November 1, 2017
MW16-4	0.910
BH/MW17-2	1.254
BH/MW17-9	0.682
BH/MW17-11	1.150

For purposes of ground water contour plotting (**Figure 5A**), the interior building boreholes (BH17-1 and BH17-2) were not included in the contour evaluation as it was inferred that these well locations which was central to the building interior would be prevented from receiving surface water recharge, especially during winter conditions, which may serve to depress the measured static water level ground water elevations, as encountered; especially since the native clay materials were noted to have a low hydraulic conductivity due to the observed slow well recharge rates.

To determine the hydraulic conductivity of the ground water, a purge or slug test was conducted on MW16-1, MW16-4 and BH/MW17-5. The initial water level was recorded and then water was purged from the wells. The re-charge rates were monitored for up to 1 hour and 7 minutes (MW16-4) with continuous water level recording undertaken. The final water level was recorded. Using the Hvorslev method, the normalized recovery was plotted versus time. The hydraulic conductivity, K, equal to the slope of the graph, was determined to be 2.4×10^{-7} m/s at MW16-1; 8.4×10^{-8} m/s at MW16-4 and 1.36×10^{-6} m/s at BH/MW17-5. The hydraulic conductivity test report is included in **Appendix C**.

On 28 September and 1 November 2017, ground water static levels were again recorded at all 2017 installed shallow monitoring wells. Ground water contours from the September and November 2017 data are illustrated in **Figure 5C**. Ground water levels observed are provide on **Table 9.8d**.

5.10 Ground Water: Sampling

Ground water samples were collected from four (4) monitoring wells (MW16-1 to MW16-4) on February 18, 2016. Water samples were collected for analyses of metals, inorganics, VOCs, PAHs, BTEX and PHCs (F1 to F4). In addition, ground water from MW16-1 was collected for analysis of pesticides parameters. Due to slow recharge, ground water samples were collected from MW16-5 on March 1, 2016 for laboratory analyses of metals, inorganics, VOCs, PAH, pH, BTEX and PHCs F1 to F4. In addition, ground water from MW16-5 was collected for analysis of pH and phenols on March 8, 2016.

The samples were placed into sterile sample bottles containing the appropriate preservatives, as supplied by Maxxam Analytics Inc (Maxxam).

The samples collected for metals were field filtered using single use in-line filters, specifically, a Waterra 0.45 micron in-line metals filter. Low flow tubing with a peristaltic pump was used to collect all samples.

A field blank sample was transported to the Site on March 1 and 8, 2016 and was analyzed for VOCs and phenols. In addition, a trip blank sample was transported to the Site on March 1, 2016 and analyzed for VOCs. Field duplicates were also collected for purposes of QA/QC verification.

On May 23 and 24, 2017 and/or August 25, 2017, ground water samples were collected from 10 monitoring wells (BH/MW17-1 to BH/MW17-9 and BH/MW17-11). Water samples were collected for analyses of metals, inorganics, free cyanide, and BTEX/ PHCs (F1 - F2). Three field duplicates were also collected for purposes of QA/QC verification.

The samples were placed into sterile sample bottles containing the appropriate preservatives, as required, as supplied by Maxxam.

The samples collected for metals were filtered using single use in-line filters, specifically, a Waterra 0.45 micron in-line metals filter. Low flow tubing with a peristaltic pump was used to collect all samples.

On November 1, 2017, ground water samples were collected from 3 monitoring wells (MW16-4, BH/MW17-2 and BH/MW17-11) for analyses of glycol. One field duplicate was collected for purposes of QA/QC verification. The samples were placed into sterile sample bottles, supplied by Maxxam.

5.11 Sediments

There are no sediments located on-site. Therefore, no sediment samples were collected as part of the current Phase Two ESA work program.

5.12 Analytical Testing

Soil samples from the boreholes, collected in February 2016, were selected from surface soils and subsurface soils in every borehole. Samples were sent to the Maxxam laboratory in Ottawa, Ontario for analysis of one or more of metals, inorganics, PAHs, VOCs (including BTEX), pesticides, FOC, and PHCs F1 to F4 analyses.

Soil samples collected from the test pits advanced in May 2016 targeted specific depths and contaminants, required for delineation purposes. These samples were sent to Maxxam, for analysis of one or more of EC, barium, chromium, FOC, grain size, vanadium and/or cobalt analyses.

Soil samples collected from the boreholes advanced in May 2017 targeted specific depths and contaminants, required for delineation purposes. These samples were also sent to Maxxam, for analysis of one or more of EC, PHCs, VOCs, metals & inorganics and free cyanide analyses. In addition, one soil / gravel sample from the small gravel stockpile was analyzed under Toxicity Characteristic Leaching Procedure (TCLP) protocols.

Soil samples collected from the boreholes advanced in March 2018 targeted specific depths and contaminants, required for delineation purposes. These samples were also sent to Maxxam, for analysis of one or more of EC, PHCs, PCBs, free cyanide and vanadium analyses. In addition, three soil samples were analyzed for grain size.

Soil and ground water samples for analysis were prepared to minimize the loss of volatile constituents, placed in coolers with ice and delivered to the laboratory by courier or dropped off by Arcadis field staff. The results of the analyses are presented in **Tables 9.1 to 9.13,** contained in Section 9.

Maxxam is accredited by the Standards Council of Canada (SCC) and conforms to the requirements of ISO/IEC 17025:2005 (CAN-P-4E). SCC accreditation is accepted by the Ministry of the Environment and Climate Change. Maxxam is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for the parameters analyzed in this Phase Two ESA program.

5.13 Residue Management Procedures

All soil cuttings, as they were generated by the augers, were mounded beside each of the borehole locations. Augers were cleaned following completion of each borehole and any residue on the augers was scraped off.

During test pit excavation, material was placed on the ground beside the test pit. Test pits were later backfilled once sample collection and observations were complete.

Excess purge water generated during monitoring well development was collected in 20 L pails and stored temporarily inside the garage building for disposal. It was disposed of on May 9, 2016 and August 25, 2017 into the building's garage floor drain, which collects into the holding tank UST located outside the building.

5.14 Elevation Surveying

The elevations of the monitoring wells and select borehole locations were surveyed on March 23, 2016 and May 25, 2017 by Arcadis personnel using a TopCon laser level. Elevations were measured relative to a local site benchmark (concrete foundation slab inside garage door) and assigned an arbitrary elevation of 100.00 m. The ground water elevations for all monitoring wells are shown on the borehole logs in **Appendix B**.

A site survey was conducted by Fairhall Moffatt & Woodland Ltd following from field activities on February 17 and 18, 2016. A copy of the full site survey (real property report), dated March 4, 2016, was provided within the Phase One ESA report for the subject property and is also included as **Appendix G**.

To obtain a more accurate estimate of the large topsoil stockpile volume, heights at various locations were surveyed on May 12, 2016 and March 13, 2018. Elevations were measured relative to a local site benchmark (concrete footing of southeastern-most lamp post, nearest the gate) and assigned an arbitrary elevation of 100.00 m. The top of the pile was found to have a relative elevation of 101.54 m at the BH16-17 location near the top of pile; the base of the pile on the north side had a relative elevation of 98.660 m. The southern end of the pile had an elevation of 99.505 m. Typical topsoil stockpile height was estimated at 3.0 m above surrounding grades.

5.15 Quality Assurance and Quality Control Measures

The principal reason for the recovery of soil and ground water samples in the field is to permit their inspection and analysis to determine whether contaminants or foreign matter is present at levels that constitute a health, environmental or construction-related liability, the discharge of which will require remedial or mitigative action. The accuracy with which the analytical results returned from chemical testing at the laboratory reflects the in-place condition is critical to the success of the site characterization program and thus every effort must be taken to ensure that the samples are recovered, handled, stored, shipped to and received at the laboratory in a condition that is representative of the material on-site.

5.15.1 Sample Preservation

Soil samples collected during the Phase Two ESA program were submitted to the laboratory using sterile sampling bottles containing appropriate preservatives, as required, and as supplied by Maxxam.

Preservation requirements for ground water samples are dependent on the parameters for which the analyses are being conducted. MECP requirements are widely adopted by the industry in Ontario and listed in the MECP document entitled Protocol for entitled *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act* dated 9 March 2004, amended 1 July 2011. The sample preservation procedures and holding time limits applied and the container types used were consistent with the requirements of the protocol document. The ground water samples collected for metals were filtered using single use in-line filters, specifically a Waterra 0.45 micron in-line metals filter. Soil samples were collected in Teflon-lined 50 ml glass jars or methanol vials and were kept in a cool condition between 4 and 10ºC and were delivered to the laboratory within seven days from the date of recovery.

Soil sampling was carried out in accordance with the 2011 amendments to O.Reg. 153/04. Where samples were tested for the presence of semi-volatile and non-volatile organics, they were analyzed within 14 days of recovery to ensure that biodegradation did not materially affect the chemical loading in the soil sample. Soil VOC samples were collected using methanol vials, according to MECP protocols.

5.15.2 Sample Seals

For the coolers containing collected soil or ground water samples, adhesive sample seals are affixed across the coolers in such a way as to ensure that the seal must be broken on opening. Seals are placed to provide evidence of tampering with samples while in transit or temporary storage between the time of recovery and delivery to the laboratory. Otherwise, all samples were in direct possession of Arcadis staff during collection and transport to the laboratory for analysis.

5.15.3 Chain of Custody

Full chain-of-custody procedures were applied from the point at which field staff surrender responsibility for the samples in the field or, where that individual is responsible for transit from the field location to the office, at their place of work. Chain-of-custody forms, which log the date of transfer and identity of the parties by and to whom the transfer has been made, also record the identity of the samples included in the shipment, the date sampled and sample location, the analyses requested for each sample, the name and address of the laboratory to which the samples are assigned, and any clarifying notes that may be required.

5.15.4 Equipment Decontamination

Prior to the start of the drilling program, all augers and centre plugs were cleaned at the shop by the drilling contractor. Geoprobe sampling utilized new plastic coring tubes to acquire each new sample run. The lead augers and centre plugs were hand-cleaned between boreholes to remove any residual soil or

debris adhering to the down-hole tools, well away from the location of any boreholes, to avoid the possibility of cross-contamination. Split spoon sampling devices were cleaned between sampling iterations and were first wiped clean of free soil or any other materials adhering to inner and outer surfaces, and then washed with a wire brush in a solution of water and laboratory-grade bio-degradable detergent (Alconox). Detergent residues were removed by rinsing with municipally-treated clean tap water. In the event that persistent organic contaminants or stains adhere to the surface of the sampler, it was sprayed with methanol then distilled water to eliminate any surficial residue. All sampling tools used (putty knives, trowels, etc.) were thoroughly cleaned following the recovery of each sample.

5.15.5 Sample Quality Management

Laboratory or field control checks were used to ensure that the quality of the analytical data was maintained at an acceptable level. Maxxam, the laboratory to which samples were sent for chemical analysis, is SCC-accredited and participate in applicable inter-laboratory testing rounds administered by provincial and federal agencies.

Field duplicate samples were prepared by obtaining a soil or ground water sample split from preselected sample locations. The splits were provided with fictitious sample names (e.g. DUP1) and submitted to the laboratory for analysis to permit a determination of the internal quality control and repeatability of analyses. At least one field duplicate sample was submitted to the laboratory for every ten samples analyzed for a specific parameter.

Trip blanks comprising deionized water were prepared by Maxxam to accompany ground water sample containers to determine whether contamination of the containers or of the samples had occurred during shipment to the field or, following recovery, during storage and shipment from the field to the laboratory. Trip blanks were included with sample sets recovered for analysis of VOCs. Field blanks were prepared at the subject property by filling ground water sampling bottles with deionized water, as supplied by Maxxam.

Matrix spikes were conducted a minimum of once during each project run by the laboratory. Field duplicate matrix spikes are normally not prepared. Laboratory duplicates are typically run in the laboratory on ten percent of the samples subject to testing.

Laboratory analysis results and QA/QC program results are carefully scrutinized on receipt to determine whether the results returned are representative. The laboratory customer services representative is contacted for clarification, if any uncertainty associated with the veracity or quality of the results is noted.

5.15.6 Deviations from the QA/QC Program

The QA/QC program was adhered to as strictly as possible with no significant deviations.

6 REVIEW AND EVALUATION

6.1 Geology

The subject property is located in the Cumberland Township area of the Ottawa Valley. It is located in the physiographic region of Southern Ontario known as the St-Lawrence Lowlands, as delineated in The Atlas of Canada (Natural Resources Canada, atlas.gc.ca, 2006 – Canada Physiographic Regions Map). The Lowlands are characterized by plain-like areas. They were affected by the Pleistocene Glaciation and the subsequent Champlain Sea which was fed by the retreating glaciers. They are covered by surficial deposits, consisting mostly of pulverized rock and other fine geological material, and features associated with glaciers.

The surficial geology observed at the subject property consists of mottled and laminated reddish-brown to blueish grey silty-clay and clay sediments deposited by the Champlain Sea that submerged the Lowlands following the Pleistocene Glaciation. The mass of this continental ice sheet had depressed the rock beneath it below the sea level. Upon the retreat of the ice sheet, the ocean submerged the Saint-Lawrence and Ottawa River valleys.

The soils up to 2.4 m below the ground surface are composed of reddish-brown silty clay and occasionally of fine sand lenses. At greater depth, the soils are very uniform and consist of blueish-grey clay with trace amounts of silt. The lower blueish-grey clay soils are very uniform in nature with a natural water content which increases gradually with depth until exceeding the liquid limit.

Water well records were found for two properties within Cumberland Township, Lot A- Concession 9 (W. Eggert and L. Gratton). Both entries indicate that blue clay was found to a depth of 27 m below grade with underlying gravel found ranging between 28.6 to 30.5 m below grade. Other well record data provided indication that the bedrock, comprising the Ottawa Formation limestone (with some shaly partings and some sandstone in the basal part), is located at depths ranging between 28 to 35 m below grade in the vicinity of the subject property.

It appears that the Site may have been stripped of its surface topsoil at the time of the initial site redevelopment occurring in the late 1980s. It is inferred that the stripped topsoil materials may remain on-site at the northeast corner of the property in the existing vegetated topsoil fill stockpile.

6.1.1 Site-specific Geology

Details of soil stratigraphy observed in the boreholes and test pits advanced at the Site are presented in the attached logs (Appendix B). With the exception of boreholes BH16-15 to BH16-17, test pit TP16-1 and BH/MW17-3, BH/MW17-5 and BH/MW17-6, gravel and/or sand fill was present at ground surface and extended to depths ranging from approximately 0.55 to 1.55 m bgs. Concrete, approximately 0.2 m thick was present at the surface of BH16-5, BH/MW17-1 and BH/MW17-02 which were all drilled inside the site garage building. At boreholes BH16-15, BH16-16, BH/MW17-3, BH/MW17-5, BH/MW17-6 and test pit TP16-1, topsoil and/or organics were present at ground surface and extended to depths ranging from approximately 0.43 to 0.60 m bgs. At borehole BH16-17, located on top of the topsoil stockpile on the northeastern part of the Site, topsoil was located at ground surface and extended to the end of borehole at approximately 2.99 m bgs. At TP16-14 and TP16-15, a 0.5 m layer of topsoil was encountered over native silty clay. Clay material was located immediately underneath the gravel/sand or topsoil/organics at all borehole locations (except borehole BH16-17 which was terminated within the above-grade stockpile) and extended to borehole termination ranging from approximately 2.99 m bgs to 4.88 m bgs.

Table 6.1: Summary of Subsurface Stratigraphy

Parameter	Unconfined Aquifer
Estimated Thickness (m)	Native clayey silt grading to clay; ranging from 0.43 m bgs to end of boreholes at maximum of 4.88 m bgs.
Elevations (m)	Top: 99.22 m; Bottom: 95.13 m
Geologic Material	Surficial gravel to gravelling sand fill; Native clayey silt, minor native sand, grading to clay at all borehole locations
Properties (K –value; m/s)	Native clay: 1 x 10^{-6} to 1 x 10^{-8} m/s (as measured in 2017)
Rationale for Investigation	Upper fill potentially contaminated from former site uses and historical activities; underlying native materials may have become impacted from surficial contaminants

Note: based on Local benchmark assigned 100.00 m (concrete slab of garage; middle north side)

6.2 Ground Water: Elevation and Flow Direction

Ground water monitoring results are summarized in **Tables 9.8a through 9.8d** and the interpreted ground water flow directions are provided in **Figure 5a through 5c**. Ground water elevations were established by Arcadis personnel relative to a site benchmark assigned an arbitrary elevation of 100.00 m ald; taken from the concrete slab within the middle north side of the maintenance garage.

On February 18, 2016, the depth to ground water ranged from 1.12 m bgs in monitoring well MW16-1 to 2.12 m bgs in monitoring well MW16-5. Ground water elevations ranged from 97.89 m ald at monitoring well MW16-05 to 98.60 m ald at monitoring well MW16-03. Ground water flow was interpreted to be generally towards the north.

On May 9, 2016, the depth to ground water ranged from 0.49 m bgs in monitoring well MW16-5 to 0.81 m bgs in monitoring well MW16-3. Ground water elevations ranged from 98.82 m ald at monitoring well MW16-01 to 99.53 m ald at monitoring well MW16-05. Ground water flow was interpreted to be generally towards the north.

The static ground water elevation data for the interior building monitoring well was disregarded for purposes of creating the ground water contours as it was inferred that recharge beneath the building would be hindered due to its location and the fact that ground water infiltration is minimal in quantity during the winter season. Further, it was expected that a stabilized static water level was not achieved for several weeks following purging due to the low hydraulic conductivities present in the native clay soils. The water levels and contours are considered reliable for all well locations aside from the indoor monitoring location which was expected to have a very slow recharge rate.

On May 23, 2017, the depth to ground water ranged from 0.569 m bgs in monitoring well MW16-2 to 2.698 m bgs in monitoring well MW17-3. Ground water elevations ranged from 97.00 m ald at monitoring well MW17-3 to 98.93 m ald at monitoring well MW16-2.

Water level monitoring in September 2017 found depths to water ranging from 0.767 to 1.05 m bgs. Overall, ground water elevations ranged from 97.98 m ald at monitoring well MW17-6 to 98.699 m ald at monitoring well MW17-8. Ground water flow was interpreted to be generally eastward.

Water level monitoring in November 2017 from 4 well locations found depths to water ranging from 0.682 to 1.254 m bgs. Overall, ground water elevations ranged from 98.521 m ald at monitoring well MW17-11 to 98.989 m ald at monitoring well MW17-9.

The monitoring well construction details and rationale were provided in Section 5 above.

6.3 Ground Water: Hydraulic Gradients and Flow Velocity

The following provides information on the horizontal hydraulic gradient (within the overburden) and ground water flow velocity:

- Horizontal hydraulic gradient (February 2016 data):

$$\mathrm{i}(1) = \frac{\mathrm{dh}}{\mathrm{dl}} = \frac{\text{difference in head}}{\text{horizontal distance}} = \frac{98.45\ m - 98.17\ m}{82.5\ m} = 0.003 \text{ (between MW16-1 and MW16-2)}$$

- Horizontal hydraulic gradient (May 2016 data):

$$\mathrm{i}(1) = \frac{\mathrm{dh}}{\mathrm{dl}} = \frac{\text{difference in head}}{\text{horizontal distance}} = \frac{98.99\ m - 98.82\ m}{82.5\ m} = 0.002 \text{ (between MW16-1 and MW16-2)}$$

The shallow horizontal hydraulic gradient ranges from 0.01 m/m to 1.97 x 10^{-4} m/m with a geometric mean of 2.65 x 10^{-3} m/m.

- Vertical hydraulic gradient (2017 data):

The vertical gradient ranges from 0.14 m/m to 0.87 m/m, but may be biased high due to the slow recharge rate observed within the deep monitoring well installation (MW17-11).

- Flow velocity (February 2016 data):

$$\mathrm{V} = Ki/n = \frac{\text{hydraulic conductivity x horizontal gradient}}{\text{porosity}} = \frac{\left(1\ x\ 10{-}10.5\frac{m}{s}\right)(0.003)}{0.55} = 1.7 \text{ x } 10^{-13} \text{ m/s}$$

where, K is equal to the average hydraulic conductivity of clay and N is equal to the average porosity of clay (Freeze, R.A. and Cherry, J.A., 1979).

Therefore, the estimated horizontal ground water velocity, based on the horizontal hydraulic gradient between MW16-1 and MW16-2, is approximately 1.7 x 10^{-13} m/s, based on February 2016 data.

6.4 Ground Water: Hydraulic Conductivity

During the May 2016 investigation, a slug test was conducted on MW16-2. The starting water level was recorded. Water was purged from the well for one minute, using Waterra tubing and low flow pump. The final water level was recorded as the initial point for well recovery. Water levels were then recorded at various intervals for the following 70 minutes of field monitoring.

Using the Hvorslev method, the normalized recovery (dimensionless) was plotted against time. The hydraulic conductivity was calculated to be 2.7 x 10^{-5} cm/s. This is several orders of magnitude higher than literature K values for clay. Due to the shallow static water table elevation and potential migration through fill zones, it was inferred that the field readings were biased high for the conductivity reading than might otherwise be expected for a clay material.

During the May 2017 investigation, hydraulic conductivity testing was conducted at MW16-1, MW16-4 and BH/MW17-5. The starting water level was recorded. Water was purged from the well for one minute, using Waterra tubing and low flow pump. Water levels were then recorded at various intervals for the following 70 minutes of field monitoring. The final water level was recorded for well recovery.

The hydraulic conductivity was calculated based on the results of hydraulic conductivity tests conducted at monitoring wells MW16-1 (at 2.4 x 10^{-7} m/s), MW16-4 (at 8.42 x 10^{-8} m/s), and at MW17-5 (at 1.36 x 10^{-6} m/s); using the conventional Bouwer-Rice method (1976). The geometric mean value of hydraulic conductivity of the native clay aquifer at the Phase Two Property is estimated to be 5.6 x 10^{-7} m/s. Flow velocity in the native clay was calculated at 1.7 x 10^{-13} m/s based on a clay porosity of 0.55.

The shallow horizontal ground water flow direction on the Phase Two Property is inferred to be towards the north and/or towards the east, based on seasonal variations (**Figure 5**).

6.5 Fine-Medium Soil Texture

Based on the presence of native fine-grained soils beneath the entire Site, four (4) soil samples, representative of the soil at the Site, were submitted to Maxxam for grain size analysis. The February 2016 results identified the soil as fine to medium textured, in accordance with O.Reg. 153/04. The May 2016 results identified the soil as a clay or heavy clay, with >50% clay content. As 50% or more by mass of the particles are smaller than 75 micometres, it was considered that site soils were medium to fine textured. In March 2018, three (3) additional soil samples were collected for the purpose of soil

classification and the creation of a graph. The March 2018 results identified the soil as a silt containing some clay and traces of fine sand. Soil texture analytical results are presented in **Table 9.6**.

6.6 Soil: Field Screening

Soil field screening techniques employed during the field assessment included recording visual observations of soil characteristics and measurement of headspace vapour concentrations using a RKI Eagle, or equivalent. Headspace vapour concentrations measured in the soil samples recovered during drilling are presented on the borehole logs in **Appendix B**. Soil CGM measurements ranged from non-detect at multiple locations to a maximum of 60 ppm at borehole sample location BH16-1-2. Typically, a soil vapour reading greater than 100 ppm is used as an alert level for which PHC analytical soil testing is required. Petroleum hydrocarbon odours and/or staining or other evidence of impacts were not evident in any of the boreholes.

6.7 Soil Quality

Soil samples collected in February 2016, May 2016, May 2017 and March 2018 selected for laboratory testing were submitted to Maxxam, a SCC accredited commercial laboratory in Ottawa, for analysis. Samples were selected to provide information on the environmental condition of the soil strata at the Site based on the presence of foreign odours or elevated vapour readings in soils as well as a protocol to select soil for analysis from the upper 1.5 m overburden and from deeper native soil horizons.

- The pH of soil on Site has been measured varying between 5.69 and 7.92 with an average pH value of 7.45 (from 40 analyses).

February 2016 Investigation

In February 2016, a total of thirty-six (36) soil samples (including field duplicate samples) were collected and submitted for the analysis of one or more of metals, inorganics (ie. pH, SAR, EC), BTEX and PHCs, VOCs, pesticides, PAHs, and FOC. The analytical results for the soil testing carried out are provided **Tables 9.1 to 9.6**, in comparison with the MECP Table 6 residential SCSs. Soil analytical results are also summarized within the **Figures**. Copies of the laboratory Certificates of Analysis are provided in **Appendix D**.

In comparison with the MECP Table 6 residential SCSs, no exceedances were observed in any soil samples for the following analytical parameters:

- PAHs;
- F1 to F4 fraction PHCs;
- VOCs (including BTEX); and,
- Pesticides.

The results do not indicate the presence of light or dense non-aqueous phase liquids.

Multiple soil samples collected from surface and subsurface soil locations exhibited concentrations of one or more of conductivity, free cyanide, cobalt, and vanadium in exceedance of the applicable MECP SCS. Two (2) soil samples collected from surface soil locations exceeded the applicable MECP SCS for barium. The instances of elevated cobalt and vanadium concentration were considered as a natural background condition. All other soil analysis satisfied the MECP SCS for metals/ inorganics.

Therefore, confirmed soil contaminants of concern (COCs) at the Site include: EC, free cyanide, barium, and chromium. A table providing the maximum concentrations of contaminants in soil is provided as **Table 9.14**.

May 2016 Investigation

A follow-up test pit investigation in May 2016 targeted the following COCs: EC, barium, chromium and cyanide. The parameters of EC, barium and chromium were reported in concentrations greater than applicable MECP SCSs in the parking lot area during the February 2016 ESA. Free cyanide was reported in concentrations greater than the MECP SCS in the large topsoil stockpile.

A total of 32 soil samples, including duplicates, were collected from test pits advanced on the Site. An additional 17 soil samples, including 2 duplicates, were collected from the large topsoil stockpile and two samples (one plus a duplicate) were collected from a small granular fill stockpile. Samples were submitted for analysis of one or more of metals, inorganics (ie. pH, SAR, EC), BTEX and PHCs, VOCs, pesticides, PAHs, and FOC. The analytical results for the soil testing carried out are provided **Tables 9.1 to 9.6**, in comparison with the MECP Table 6 residential SCSs. Soil analytical results are summarized in the attached **Figures**. Copies of the laboratory Certificates of Analysis are provided in **Appendix D**.

Samples collected from the vicinity of BH16-13 were analyzed for chromium, to further delineate the chromium exceedance noted in earlier results. Samples collected from surface soils in TP16-1 through TP16-4 did not contain chromium at concentrations in excess of the MECP Table 6 SCS. These results indicate that the chromium concentration exceedance is quite localized around BH16-13 and does not extend off-property.

Samples collected in the vicinity of BH16-6 and BH16-11 were analyzed for barium, to further delineate the barium exceedances noted in earlier results. Samples collected from surface soils in TP16-4, TP16-5 and TP16-11 contained barium at concentrations in excess of the MECP Table 6 SCS. The extent of barium impacts was delineated vertically based on underlying sampling at both BH16-6 and at BH16-11. Horizontal delineation was achieved at the next clean borehole for barium impacts.

All samples collected from test pits advanced in the graveled area of the site, with the exception of the sample collected from TP16-3, contained electrical conductivities in excess of the Table 6 SCS. This is consistent with the February investigation results. It is inferred that the use of salt as a de-icing agent may have contributed to the elevated EC concentrations across the entire graveled parking lot.

Samples collected from native soil under of the large topsoil stockpile (TP16-14 and TP16-15) were analyzed for cyanide. No exceedances were noted in the underlying soil samples or in soils elsewhere on the property.

May 2017 Investigation

A follow-up borehole and monitoring well investigation in May 2017 was conducted to address MECP PSF comments (as provided in **Appendix I**) in which the static water table equilibrated above the well screens. Shallower installation wells were required to be installed as screened from 0.3 to 3.3 mbgs.

A total of twelve (12) soil samples (including two field duplicate samples) were collected and submitted for the analysis of one or more of metals, inorganics (ie. pH, SAR, EC), BTEX & PHCs, and VOCs. The analytical results for the soil testing carried out are provided **Tables 9.1 to 9.7**, in comparison with the MECP Table 6 residential SCSs. Soil analytical results are also summarized on the **Figures.** Copies of the laboratory Certificates of Analysis for Soil are provided in **Appendix D**.

In comparison with the MECP Table 6 residential SCSs, no exceedances were observed in any soil samples for the following analytical parameters. The results do not indicate the presence of light or dense non-aqueous phase liquids.

One soil sample (BH17-7) collected from surface exhibited concentrations of conductivity in exceedance of the applicable MECP SCS and one soil sample collected (BH17-3) from subsurface exhibited concentrations of cobalt and vanadium in exceedance of the applicable MECP SCS. All other soil analysis satisfied the MECP SCS for metals/ inorganics. Elevated cobalt and vanadium concentrations were considered as a natural background condition. A table providing the maximum concentrations of contaminants in soil is provided as **Table 9.13**.

Samples collected from surface and subsurface soil at locations BH/MW17-3, BH/MW17-5 and BH/MW17-6 were analyzed for cyanide. No exceedances were noted in these soil samples providing indication that the cyanide was limited to locations within the above-grade topsoil stockpile.

March 2018 Investigation

A follow-up borehole investigation in March 2018 was conducted to address MECP PSF comments (as provided in **Appendix I**) in which three new boreholes were advanced through the large topsoil stockpile and sampled for free cyanide (SP301, SP302, SP303). Four other boreholes were advanced on the property to secure soil samples at depth for EC and vanadium delineation + grain size analyses (BH18-1 to BH18-4). Three shallow soil samples were secured in the vicinity of the Ground Transformer (APEC 13) to verify absence of PHC F1- F4 and PCBs.

A total of twenty (20) soil samples (including three field duplicate samples) were collected and submitted for the analysis of grain size, PHCs F1 – F4, PCBs, EC, vanadium and free cyanide.

In comparison with the MECP Table 6 residential SCSs, no exceedances were observed in any soil samples for PHCs F1 - F4, PCBs and EC. However, vanadium concentrations in soil samples collected from locations BH18-1 to BH18-4 at 4.5 to 4.8 mbgs exceeded the MECP Table 6 residential SCSs.

Samples collected from subsurface soil underneath the large soil stockpile at locations SP301, SP302 and SP303 were analyzed for cyanide. No exceedances were noted in these soil samples providing indication that the cyanide was limited to locations within the above-grade large topsoil stockpile.

July 2018 Investigation

Follow-up boreholes and soil sampling investigations were completed in July 2018 comprising three deep boreholes to >10 m bgs which were advanced to provide confirmation of natural background V and Co concentrations (BH18-8 to BH18-10). The deep clay samples confirmed that V and Co remain at elevated concentrations at depth in the native clay soil.

The analytical results for the soil testing carried out are provided **Tables 9.1 to 9.7**, in comparison with the MECP Table 6 residential SCSs. Soil analytical results are also summarized on the **Figures.** Copies of the laboratory Certificates of Analysis for Soil are provided in **Appendix D**.

6.7.1 Review of Background Conditions in Relation to Contaminant of Concern

The previous Strata report noted elevated concentrations of cobalt and vanadium in the native clay soils following the UST removal program that occurred in July 2015. Cobalt was reported at concentrations ranging from 27 to 30 ug/g (vs. Table 6 standard of 22 ug/g) and vanadium at concentrations of 90 to 97 ug/g (vs. Table 6 standard of 86 ug/g) in samples of native clay recovered from the excavation limits.

Based on the following lines of evidence, Arcadis is of the opinion that the elevated concentrations of cobalt and vanadium in the Ottawa region native clay soils is a background condition, and do not constitute COCs:

i) ‘contaminants’ are widespread across the entire site and not just focused around the maintenance garage and former tank areas. As the elevated cobalt and vanadium concentrations were found across the entire site, this is indicative of a potential ‘background’ condition which may affect properties in the Ottawa region underlain by former Champlain Sea clay sediments. Further, the local MECP district office had indicated that several other Ottawa-based consulting firms had encountered similar exceedances of Table 6 criteria for vanadium and cobalt in native soils. A research paper presented at GeoOttawa 2017 found that four common metals were elevated in Champlain Clays; that of barium (with a proposed geo-regional background value of 460 ug/g), chromium (with a proposed geo-regional background value of 149 ug/g), cobalt (with a proposed geo-regional background value of 28 ug/g) and vanadium (with a proposed geo-regional background value of 123 ug/g);

ii) ’Contaminant’ concentrations increase with depth or remain consistent across the entire site. Typically, contamination derived from site activities primarily affects the surface soils and may potentially then

impact subsurface soils at depths greater than 1.5 m, at typically lowered concentrations. Following from the Phase II EA for the subject property, cobalt concentrations exceeding the standard was found at a maximum of 28 ug/g at one sample with four others at 27 ug/g and 16 remaining soil samples were elevated above the 22 ug/g standard for a Residential Land use. Vanadium concentrations exceeding the standard were found at a maximum of 130 ug/g at one sample with four others at 120 ug/g and 17 remaining soil samples were elevated above the 86 ug/g Residential Land use standard.

Cobalt concentrations increased with depth at all borehole locations except for BH16-15 were it remained equal in concentration at 26 ug/g and at BH16-15 where the cobalt concentration decreased from 25 to 24 ug/g. Vanadium concentrations increased with depth at all borehole locations except for BH16-10 were it remained equal in concentration (at 110 ug/g); at boreholes BH16-13 and BH16-14 where the vanadium concentration decreased from 120 to 100 ug/g; at BH16-15 which decreased from 110 to 100 ug/g; and at BH16-16 where it remained equal (at 110 ug/g). In some instances, the native clayey soil material was found at shallow depths less than 1.5 m below grade which perhaps explains why elevated cobalt or vanadium was encountered at shallow depths in some isolated instances.

iii) former bus maintenance activities are not known to generate either cobalt or vanadium. Anthropogenic sources of cobalt include mining/processing of cobalt-containing ores, the application of cobalt-containing sludge or phosphate fertilizers, the disposal of cobalt-containing wastes and atmospheric deposition from smelting and refining of metals or burning of fossil fuels. Anthropogenic sources of vanadium include the combustion of fossil fuels (particularly residual fuel oils), the extraction mining/ processing of coal and petroleum crude oils, mine tailings, certain fertilizers and municipal sewage sludge.

iv) Background scientific documentation was reviewed by Arcadis to determine the geomorphological processes, such as repeated cycles of glaciation, that have altered the geological landscape of the Ottawa area and that may help explain the naturally elevated metal concentrations discussed above. During the last glacial ice-age 10,000 to 12,000 years ago, the Wisconsinan Laurentide Ice Sheet isostatically depressed the St. Laurence Lowlands during the last glacial maximum. Following the Northward retreat of the ice sheet, the inland arm of the Atlantic Ocean inundated the St. Laurence Lowlands which lead to the formation of the Champlain Sea (Parent and Occhietti, 1988). Glaciomarine, prodelta, and fine sediments (silt, clayey silt, silty clay, clay, et.) were deposited in the St. Laurence-Lowlands-Ottawa Valley over the course of the existence of the Champlain Sea. Subsequent isostatic rebound lead to the regression of the sea level through the early Holocene and ended marine deposition (Parent and Occhietti, 1988; and Rust and Romanelli, 1975).

The three main unconsolidated quaternary geologic units of the Champlain Sea are: drumlinized till, north-south trending sand and gravel eskers, and clay rich marine sediments with minor sand (otherwise known as “Leda Clay”) (Richard, 1982; Cummings, 2011). The clay-rich marine sediments consist primarily of quartz, feldspar, amphiboles, pyroxenes, and clay minerals, which reflects the Canadian Shield as the primary material provenance. This clay-rich unit was deposited in a saline to brackish marine environment, resulting in a porous and loose structural framework making it geotechnically sensitive and prone to failure events (as witnessed in the 1993 Lemieux Landslide in Prescrott-Russell) (Evans and Brooks, 1994).

Based on the Ontario Geological Survey quaternary geological map, the “Leda Clay” deposits are scattered throughout the Ottawa region, and are notably the dominant surficial quaternary geologic unit in the Orleans/Cumberland area East of Ottawa; these units are characterized as quiet water deposits as shown by their clay grain size and very well sorted sedimentary texture. Based on the borehole logs collected in the scope of this investigation, the dominant geologic material at 1830 Trim Road is brownish-grey clay, which is found typically near surface at depths ranging from 0.1 to 1 mbgs and extends vertically until borehole termination at depths between 3 to 7 mbgs. The clay is very well sorted and homogenous in nature and has high plasticity when wet. Based on this description, the clay soil at the Site was deemed to be classified as “Leda Clay”, which is consistent with the Ontario Geological Survey quaternary geological map.

Vanadium and other select metals (namely Barium, Cobalt, Chromium VI) have been shown to exceed on a consistent basis the MECP Table 1 Background Condition Standards for Residential Land Use in other previous environmental assessments conducted in the Leda Clays of the Orleans/Cumberland area of the Ottawa region, such as presented in the 2017 GeoOttawa paper entitled “Table 1 in Perspective: Naturally Occurring Metals in Fine-Grained Champlain Sea Deposits, Ottawa” by Dawley, Hardie and West (2017). As part of the Stage 2 Ottawa Light Rail Transit (OLRT) geo-environmental investigation, drilling occurred within the Leda Clay deposits that run parallel to the Eastern extension (Confederation East) of this rail alignment along Highway 174, located approximately 2.7 kilometers to the North of the 1830 Trim Road site. Concentrations of barium, chromium, cobalt, and hexavalent chromium were routinely measured to be above that of MECP Table 1 through the analysis of 59 clay to clayey-silt samples, whereas vanadium was routinely detected above that of MECP Table 3 (46% of the time) with an average vanadium concentration of 71 ug/g with a range from 8.6 ug/g to 136 ug/g.

The vanadium and other metal exceedances in the Leda Clays of the Ottawa area can be explained by the provenance from which these sediments were derived from, namely from Precambrian Canadian Shield rocks, which are known to be naturally enriched in certain metals as demonstrated by the numerous mining camps in Northern Quebec and Northern Ontario. For example, vanadium has an average concentration of 100 ppm (100 ug/g) in the earth's crust (Byerrum, 1991) which makes it the 22nd most abundant element in the crust (Baroch 2006). When vanadium rich rock erodes it creates locally vanadium rich sediment/soils.

With regards to characterizing the geochemical signature of Leda Clay and comparing it to the chemical data collected in the scope of this investigation, Arcadis located a scientific report entitled "Geochemistry of a Champlain Sea aquitard, Kinburn, Ontario: portable XRF analysis and fusion chemistry; Geological Survey of Canada, Open File 7085; R.D. Knight, M. Moroz, H.A.J. Russell, 2012". This report detailed a review of native Champlain Sea sediment soils (silts/sands grading to clays) and associated metals analysis using a XRF spectrometer in comparison with laboratory ICP-EC/MS analysis. A total of 79 sediment samples were secured from the native Champlain Sea sediments and XRF analyses were performed for 18 metals elements (including vanadium, but not including cobalt). From Figure 8 of the report, Vanadium XRF concentrations in the native clay soil ranged from 65 ug/g up to a maximum of 133 ug/g. From Figure 16 of the report, Vanadium concentrations in upper overburden ranged from 95 ug/g at the surface increasing up to 119 ug/g by approximately 8 m depth below grade, based on ICP laboratory analyses. This scientific report demonstrates that Vanadium concentrations in native Champlain Sea sediments, similar to that encountered at the subject property, are known to exceed the MECP Table 6 standard in a background condition.

Additionally, a scientific report was provided by the MECP to Arcadis entitled "Investigation into Chemical Concentration of Shales in Ontario – 1997" (Report # SDB-023-3511-1988, Phytotoxicology Section, Standards Development Branch, OME). In this report, a Rockcliffe Shale formation located in east Ottawa was found to have a cobalt concentration of 31.5 mg/kg. There were no overlying soils on this deposit reported in the study. However, it is known that Leda clay sediments are composed of particles from limestone and shales that were finely ground by glaciers and washed into the Champlain Sea. Any local shale particles may have up to 31.5 ug/g of cobalt content and that local clays derived from these shales could theoretically exceed the MECP Table 6 standard set at 22 ug/g for cobalt as a background condition.

A research paper presented at GeoOttawa 2017 (entitled "*Elevated Background Metals Concentrations in Champlain Sea Clay- Ottawa Region*") found that four common metals were naturally elevated in Champlain Clays; that of barium (with a proposed geo-regional background value of 460 ug/g), chromium (with a proposed geo-regional background value of 149 ug/g), cobalt (with a proposed geo-regional background value of 28 ug/g) and vanadium (with a proposed geo-regional background value of 123 ug/g).

v) Scientific documentation indicates that natural background vanadium concentrations can be encountered to a maximum of 133 ug/g, while subject site measurements were found at a maximum of 130 ug/g. Scientific documentation also indicates that natural background cobalt concentrations can approach 31.5 ug/g, while subject site measurements were found at a maximum of 28 ug/g. Based on the foregoing, the elevated cobalt and vanadium concentrations found across the entire site in the native soil horizon was interpreted to be a 'background' condition.

6.8 Large Topsoil Stockpile Soil Quality

One large topsoil stockpile was identified during the Phase One ESA (APEC 10). Fifteen soil samples were collected from this above-grade stockpile during the May 2016 investigation, in accordance with O. Reg. 153/04. Samples were analyzed for free cyanide. Eleven of the soil samples slightly exceeded the MECP Table 6 SCS for cyanide set at 0.051 ug/g (same as the Ontario background concentration set for cyanide in soil). The average cyanide concentration for the 11 exceeding samples was 0.065 ug/g. Results are illustrated on **Figure 9b**.

In March 2018, three boreholes were placed through this topsoil stockpile and no SCS exceedances of cyanide in soil were noted beneath the stockpile.

6.9 Small Gravel Stockpile Soil Quality

A small granular materials stockpile was identified on-site during the May 2016 investigation (APEC 9). As its volume was estimated to be 45 m^3, five soil samples were collected from the sides of this above-ground stockpile (see location on **Figure 3**) with one composite submitted for laboratory analyses. This SP203 sample was analyzed for all COCs at the site (PHCs, VOCs, metals, inorganics, PAHs and pesticides). Sample SP203 and its duplicate (DUP-6) exceeded the MECP Table 6 SCS for F3 PHCs (and F4 PHCs in the duplicate). No other exceedances were noted.

An additional soil sample was collected from this small granular fill stockpile during the May 2017 investigation. This sample was submitted for the testing of Toxicity Characteristic Leaching Procedure (TCLP) analysis. The TCLP analytical results for the soil testing carried out are provided in **Table 9.7.** Copies of the laboratory Certificates of Analysis are provided in **Appendix D**. The soil sample results indicate that the soil from the small gravel stockpile was classified as a non-hazardous, solid waste.

Following the indication that the soil from the small stockpile is a non-hazardous waste, Arcadis completed supervision of the removal of the small stockpile on 13 July 2017. Maurice Yelle Excavation Ltd. was hired to haul the stockpile materials to the BFI Canada Navan Landfill in Ottawa using a backhoe and transport truck. A total of 111.17 metric tonnes of the stockpile soil and gravel material mixture was removed from the Trim Road site and disposed of at the Landfill.

Further details on this remediation program are provided in **Appendix J** along with the way bills from the landfill disposal operations.

Three (3) soil samples were collected by hand from the native underlying at-grade sand and gravel fill material (i.e. not from the stockpile material) on 25 August 2017 (including one duplicate). These verification samples (including one field duplicate sample) obtained from the base of stockpile excavation were submitted for laboratory analyses and were observed to meet applicable SCSs at grade.

6.10 Ground Water Quality

Ground water samples collected in February and March 2016 and in May, August and November 2017 for laboratory testing were submitted to Maxxam Analytics, a SCC accredited commercial laboratory in Ottawa, Ontario, for analysis. Samples were selected to provide information on the environmental conditions of the ground water at all monitoring well locations.

The total number of ground water samples (including field duplicate samples) which were collected and submitted for the analysis are listed below for each of the parameters analyzed:

- Pesticides - 2 samples
- Metals - 21 samples
- PHCs and/or VOCs - 16 samples
- Phenols - 2 samples
- PAHs - 6 samples

- Glycol - 3 samples

The analytical results for the testing carried out are provided on **Tables 9.9 to 9.13**. Ground water analytical results are also summarized on **Figures 18 through 23**. Copies of the laboratory Certificates of Analysis are provided in **Appendix E**.

Concentrations of all analyzed parameters were below the MECP Table 6 SCSs (residential land use/ potable water use) in the ground water samples submitted, aside from uranium and chloride exceedances. Uranium and chloride were above MECP Table 6 SCS as measured at MW16-4 (chloride at 1100 mg/L, uranium at 22 ug/L), MW17-1 (chloride at 880 mg/L, uranium at 47 ug/L) and at MW17-9 (chloride at 910 mg/L, uranium at 23 ug/L) in comparison with the Table 6 criteria for chloride set at 790 mg/L and uranium set at 20 ug/L. No evidence of chemical or biological transformations was observed in the analytical results. The results do not indicate the presence of light or dense non-aqueous phase liquids.

6.10.1 Review of Background Groundwater Conditions in Relation to Contaminant of Concern

Naturally occurring uranium in groundwater can be a result of the dissolution of uranium bearing minerals that have been in contact with groundwater for long periods of time. Uranium is a naturally occurring radioactive metal that occurs in low concentrations in nature. It is present in certain types of soils and rocks, especially granites. Uranium can also be found in the environment as a result of human activities such as mill tailings, emissions from the nuclear industry, and the combustion of coal and other fuels. The source of chlorides in groundwater could potentially be related to road salts following from school bus car wash garage activities.

Former bus maintenance activities are not known to generate uranium. Background scientific documentation evidence was reviewed by Arcadis staff. Arcadis located a scientific report entitled published Montcoudiol, N., Molson, J., and Lemieux, J-M. entitled “Groundwater Geochemistry of the Outaouais Region (Quebec, Canada): a regional scale study, Hydrogeology Journal, March 2015, Vol. 23, p. 377-396”.

In this report, groundwater quality parameters were measured in private and public ground water wells throughout the Gatineau region. The study noted that uranium and chloride concentrations in certain wells exceeded the Canadian Drinking Water Standards (Montcoudiol et al., 2015). In the context of the study,

the wells that showed uranium concentrations above that of the Canadian Drinking Water Standards were screened within Canadian Shield bedrock. With regards to uranium, the exceedances were measured to be as high as 130 ug/L as compared to the 20 ug/L MECP Table 6 standard. The elevated uranium concentrations measured in the study were inferred to be linked to the dissolution of uranium-bearing minerals in the Canadian Shield bedrock (namely in the granitic pegmatites in the area).

The Leda clays of the Champlain Sea in the vicinity of the subject property mostly consist of illite and micas. The origin of these micaceous minerals is inferred to be from the weathering of the underlying Ordovician bedrock in the Ottawa area, and from the weathering of the Proterozoic-age Grenville Province (Canadian Shield) rocks to the north in the Gatineau area during the previous glacial ice-age (Ontario Geological Survey, 1981). The elevated uranium concentrations in the ground water at 1830 Trim road may be due to the leaching and dissolution of uranium from the interaction of ground water with the uranium-rich clays derived from the weathering of Canadian Shield bedrock, located several kilometers to the north of the site.

With regards to chloride, seawater flooded the Ottawa River valley 10,000 years-ago during the last glacial maximum. The Leda marine clays of the Champlain Sea were deposited during this period, and are known to contain enriched concentrations of Na-Cl due to their marine origin. Natural seawater contains 35 g/L of salt (Na-Cl) content.

Nonetheless, as the uranium and chlorides were only found in the vicinity of the shop drains holding tank and north end of the interior maintenance pit, these do not appear to be widespread across the site which would be expected for an element reflective of a natural background condition in groundwater.

6.11 Sediment Quality

No sediments or sediment-containing water bodies were identified at the subject property.

6.12 Quality Assurance and Quality Control Results

Arcadis quantitatively assessed the analytical quality of the data through calculating the relative percent difference (RPD) between each parent sample and its corresponding duplicate.

Laboratory QA/QC consisted of analysis of replicate samples, method blanks, spiked method blanks, surrogate standard recoveries, and the use of analytical methods in accordance with the SCC guidelines. Laboratory QA/QC is documented in the certificates of analysis provided in **Appendix D**.

The sampling procedure and the laboratory analytical precision were evaluated by submitting field duplicates and comparing the duplicate results to the results of the corresponding sample. For each set of laboratory blind duplicates, the RPD was calculated using the following formula:

RPD =(| X1 – X2 | / Xavg) x 100

Where, X1 and X2 are the measured concentrations of the duplicate pairs and Xavg is the mean of these two values.

Results for duplicate analyses of field duplicate samples were considered acceptable where RPD values were as follows:

- VOC analysis: <30% for water duplicate analysis and <50% for soil duplicate analysis;
- PHC analysis: <30% for water duplicate analysis and <30% for soil duplicate analysis;
- Metals/Inorganics analysis: <20% for water duplicate analysis and <30% for soil duplicate analysis;
- PAH and Pesticide analysis: <30% for water duplicate analysis and <40% for soil duplicate analysis;
- EC analysis: <10% for water duplicate analysis and <10% for soil duplicate analysis;
- Chromium (VI), FOC, Chloride, and Cyanide analysis: <20% for water duplicate analysis and <35% for soil duplicate analysis; and,
- Hot Water Soluble Boron analysis: <40% for water duplicate analysis and <40% for soil duplicate analysis;

The RPD acceptance criteria is consistent with MECP guidelines. Consistent with common industry practices, the RPDs were only calculated when both the parent and field duplicate samples were detected at concentrations greater than five (5) times the laboratory reportable detection limits (RDLs).

A summary of the analytical results for the parent and duplicate samples, along with the calculated RPDs, are included in soil analytical results in the **Tables 9.1 through 9.7** and ground water analytical results in **Tables 9.9 through 9.12** located in Section 9 of this report. QA/QC results are discussed below.

6.12.1 Ground Water

For ground water samples, all analytes that were tested reported acceptable RPDs. The laboratory and field QC were generally within acceptance criteria and alert limits, respectively. No specific deviations were identified. Overall, the laboratory and field QA/QC results confirm that sample handling and analytical protocols were acceptable, and the results were reproducible.

A trip blank, as prepared by Maxxam, accompanied Arcadis to the Site on March 1, 2016. The sample remained in its sealed state and was analysed for PHCs F1-F4, BTEX, and VOCs as per O.Reg. 153/04. The results of the trip blank analysis indicated that no analytes in the trip blank sample were detected, indicating a low potential for cross contamination from field and laboratory practices.

A field blank was also prepared in the field on March 1 and March 8, 2016 by transferring de-ionized water into the appropriate laboratory supplied bottles and submitting the sample for laboratory analysis of PHCs F1-F4, BTEX, VOCs, and Phenols. The results of the field blank analysis indicated that no analytes in the field blank sample were detected, indicating a low potential for cross contamination from field and laboratory practices.

All hold times were met and the appropriate preservation methods were used. Samples were collected in the appropriate clean sample containers provided by Maxxam and were stored on sufficient ice to keep the temperature between 0 and 10 ^{o}C. All certificates of analysis and analytical reports were within acceptance criteria. Completed chain-of-custody forms accompanied all analyzed samples and they are included with the laboratory certificates provided in **Appendix D**.

All certificates of analysis and analytical reports comply with subsection 47 (3) of O. Reg. 153/04; a certificate of analysis has been received for each sample submitted for analysis; and all certificates of analysis received have been included in **Appendix D** to the Phase Two ESA Report.

6.12.2 Soil

All analytes tested for soil samples collected on-site reported acceptable RPDs with the following exceptions:

- EC and several metals parameters in parent sample BH16-14-1 and field duplicate sample DUP-2;
- Several metals parameters in parent sample SP203 and field duplicate sample DUP-6; and
- Chromium results in parent sample TP16-3-2 and DUP-1.

Soil alert limit exceedances are primarily the result of low levels of the compounds detected in soil. Low concentrations tend to increase the magnitude of the RPD, but can be caused by minor variations in soil composition between a primary sample and its duplicate. Alert limit exceedances are also likely due to the heterogeneous nature of soils samples. When RPD alert limits occurred, the most conservative values were used to evaluate whether the sample exceeded the SCSs (i.e. highest of the two concentrations is used to

determine if location is contaminated). Also, when RPD alert limits did occur, both the parent and duplicate sample satisfied the SCS, indicating no bias in the sample results.

Due to higher moisture content present in some of the samples, laboratory detection limits for certain parameters were increased to the point that the limit of detection (laboratory reportable detection limit or RDL) was above the MECP Table 6 standards, in some instances. This situation only applied to samples BH16-3-2, BH16-2-2 and the BH16-2-2 duplicate and only for the following analytical test parameters on soil as related to PHCs or VOCs: Bromomethane, 1,2-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, 1,2-Dichloropropane, Ethylene Dibromide, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane and Vinyl Chloride. As the static water table was encountered at 0.5 mbgs, elevated moisture contents would be expected in most soil samples. Based on these elevated RDL values, the concentrations shown in **Table 9.1** for these sample locations and for these parameters should not be taken as absolute and actual values may be below MECP standards in some or all cases. Based on the absence of PHC and VOC exceedances at remaining soil sampling taken elsewhere on the Site and the fact that these two sampling locations of BH16-2-2 and BH16-3-2 were generated from native moist to wet clayey soils, no concerns were raised due to the elevated RDL values presented.

The results of RPD calculations for field duplicate soil and ground water samples were generally all less than the applicable alert limits. Elevated RPDs in soil include the following:

a) The RPD for EC between soil samples BH16-4-1 and its Duplicate (Dup-2) was above the alert limit of 30% for metals/inorganics (EC RPD at 39%). This same sample duplicate also had elevated RPDs for Calcium (at 63%), Magnesium (at 54%), Beryllium (at 36%) and Uranium (at 43%). As this sample was secured from a surficial location and comprised gravel fill soils, heterogeneity would be expected between the original sample and its duplicate. All listed parameters met applicable SCSs so the variability of the results does not materially affect the interpretation of the data in comparison with the regulatory standards;

b) The RPD between soil samples SP203 and its Duplicate (Dup-6) was above the alert limit of 30% for metals. Elevated RPDs were noted for Chromium (at 53%), Cobalt (at 72%), Copper (at 66%), Lead (at 8%) and Nickel (at 69%). As this sample was secured from a mixed above-grade gravel stockpile location and comprised mixed gravel fill soils, heterogeneity would be expected between the original sample and its duplicate. All listed parameters met applicable SCSs so the variability of the results does not materially affect the interpretation of the data in comparison with the regulatory standards. This same original sample and duplicate had an elevated PHC F4 RPD of

31% in comparison with the MECP recommended PHC RPD of 30%. As this was only a marginal RPD exceedance and the fact that the originating material was a mixed gravel fill, it was considered that this variability of the PHC F4 result did not materially affect the interpretation of the data in comparison with the regulatory standard;

c) The RPD between soil samples BH17-3-2 and its Duplicate (Dup-1) was above the alert limit of 30% for metals. Elevated RPDs were noted for Lead (at 36%), Uranium (at 33%), and SAR (at 86%). As this sample was secured from upper horizon of native clay, heterogeneity can occur between the original sample and its duplicate. All listed parameters met applicable SCSs so the variability of the results does not materially affect the interpretation of the data in comparison with the regulatory standards.

No elevated RPDs were noted in any of the field blind duplicate groundwater samples analyzed.

The laboratory analytical results were generally within acceptance and alert limits. Where deviations existed, they did not materially affect the analytical results, nor the conclusions based on the results.

TABLE 6.2: Frequency of QA/QC Field Duplicates Collected

Parameter	Number of Samples Analyzed			Number of Duplicates Analyzed			Frequency of Duplicates (%)
	Soil	Ground Water	Total	Soil	Ground Water	Total	
Metals/ Inorganics	87	15	102	12	5	17	16
PAHs	21	5	26	3	1	4	15
PHC+VOC	33	14	47	6	2	8	15
Pesticides	10	1	11	2	1	3	27
FOC	3	-	3	0	0	0	-
Glycol	-	2	2	-	1	1	50

The frequency of field duplicates collected per original samples submitted for laboratory analysis is above 10%. Sufficient field duplicate samples were collected.

6.13 Phase Two Conceptual Site Model

6.13.1 Potentially Contaminating Activities and Areas of Potential Environmental Concern

PCAs identified on the Site were outlined in the Phase One ESA report prepared by Arcadis. The PCAs identified at the Site include:

PCA 1 - Operation of a bus maintenance garage and wash bay; including (a) the use of lubricants, motor oils, grease and gear oils, (b) the production of waste oils and presence of an oil-water separator, (c) the use of antifreeze and bus windshield wash fluid, (d) the use of solvents for parts de-greasing, (e) the use of maintenance tools which may generate metal grindings/ welding fumes, (f) the replacement of vehicle tires and (g) the presence of solid waste bins and scrap metal dumpsters (O.Reg.153/04; Part VI; Table 2 PCA items: 4 (antifreeze bulk storage), 51 (solvent storage), 52 (vehicle maintenance));

PCA 2 - Bus maintenance garage services and associated infrastructure, including (a) a septic field and tank, (b) an underground waste oil tank and (c) a shop drainage/sanitary underground holding tank (O.Reg.153/04; Part VI; Table 2 PCA item: 58 (waste disposal and waste management), 28 (gasoline and associated products));

PCA 3 - Placement of gravel fill of unknown origin across the Site for purposes of the bus parking area (O.Reg.153/04; Part VI; Table 2 PCA item: 30);

PCA 4 - Maintenance of the gravel parking lot, including the use of road de-icing salt (O.Reg.153/04; Part VI; Table 2 PCA item: no code; use of road de-icing salt);

PCA 5 - Presence of the stockpile of excess topsoil fill in the northeast corner of the property (O.Reg.153/04; Part VI; Table 2 PCA item: no code; presence of cyanide in native topsoil);

PCA 6 - Former diesel USTs present in yard to the north of the maintenance garage building (O.Reg.153/04; Part VI; Table 2 PCA item: 28 (gasoline and associated products));

PCA 7 - Potential for pesticide use with former agricultural operations (O.Reg.153/04; Part VI; Table 2 PCA item: 40 (pesticides)); and

PCA 8 - Presence of the small granular materials stockpile (excess fill) located on the edge of the graveled area, near the gate; (O.Reg.153/04; Part VI; Table 2 PCA item: 30 (fill of unknown quality)).

PCA 9 - Presence of a ground transformer (circa 1990) located at the southeast corner of the site building (O.Reg.153/04; Part VI; Table 2 PCA item: 55).

Adjacent residential site land uses were not considered to be PCAs.

Contaminants of potential concern present or potentially present on the Site include the following:

i) PAHs associated with by-products of combustion (school bus uses) or presence of diesel fuel;
ii) PHCs (F1 to F4) and BTEX as associated with the former use of oils, greases, fuels and lubricants;
iii) VOCs, particularly the BTEX compounds associated with potential use of fuels; and with respect to thinners/ degreasers or other solvent uses;
iv) inorganics/metals as associated with metal working/ welding/ grinding, road de-icing salt storage/use and use of uncharacterized imported gravel fill materials;
v) pesticides, as potentially related for former agricultural uses. No known orchard or fruit tree uses known to have occurred at or adjacent to the subject property; and,
vi) PCBs potentially associated with the exterior box transformer use.

All contaminants of concern were expected to potentially be present in both soil and ground water; aside from transformer oils potentially containing PCBs which were expected to be a shallow soil impact immediately next to the transformer.

The findings of the Phase One ESA report completed by Arcadis have identified several past or present uses on, in, or under the Phase One property, and PCAs on, in, or under the Phase One property or within the Phase One study area. These result in APECs on the Phase One property where one or more contaminants may be present.

PCAs which were determined to be of negligible concern were not classified as APECs. The PCA-8: Hydro Ottawa electrical transmission corridor was not considered as an APEC as there were no transmission towers installed within the subject property itself and the fact that the likely metals

contaminants of concern were to be evaluated based on environmental testing conducted for the evaluation of APEC 7 (parking lot gravel fill). The APECs assessed in this Phase Two ESA are provide on Table 6.3 below.

Table 6.3 - Assessment of APECs

APEC	CoCs	Sample Locations	Parameters Analyzed	CoCs Identified in Soil	CoCs Identified in Ground Water
APEC 1: (Inside Garage) Use of lubricants, motor oils, greases; production of waste oils; use of antifreeze and windshield washer fluids; generation of welding fumes and grindings; replacement of bus tires.	VOCs, PHCs, Glycol	**Soil:** BHMW16-5, BHMW17-1, BHMW17-2 **Ground Water:** BHMW16-4 BHMW16-5, BHMW17-1 to -2 and BHMW17-11 (outside garage)	**Soil:** VOCs, PHC F1-F4, Metals and Inorganics, PAHs **Groundwater:** VOCs, PHC F1-F4, PAHs, Metals and inorganics, Glycol	• None Identified	• Uranium • Chlorides
APEC 2: Parts de-greasing operations (inside garage)	Metals, VOCs,	**Soil:** BHMW16-5, BHMW17-1, BHMW17-2 **Ground Water:** BHMW16-5, BHMW17-1, BHMW17-2	**Soil:** Metals, VOCs **Ground Water:** Metals, VOCs	• None Identified	• None Identified
APEC 3: Solid waste bins and scrap metal bins (outside, west side of garage)	Metals	**Soil:** BH16-9, TP16-11 **Ground Water:** BHMW17-2	**Soil:** Metals **Ground Water:** Metals	• EC, Barium	• None Identified

APEC	CoCs	Sample Locations	Parameters Analyzed	CoCs Identified in Soil	CoCs Identified in Ground Water
APEC 4: Presence of Septic Holding tank (Outside, East side of Garage)	Metals, VOCs, PHCs, PAHs	**Soil:** BH16-8, BH/MW17-3 **Ground Water:** BHMW17-3	**Soil:** Metals, VOCs, PHCs, PAHs **Ground Water:** Metals, VOCs, PAHs, PHCs	• EC	• None Identified
APEC 5: Former Waste Oil tank (Outside, to north of garage)	VOCs, PHCs, metals	**Soil:** BHMW16-3, BH/MW17-8 **Ground Water:** BHMW16-3, BH/MW17-8	**Soil:** Metals, VOCs, PHCs **Ground Water:** Metals, VOCs, PHCs	• EC	• None Identified
APEC 6: Shop Drains holding tank (Outside, to north of garage)	Metals, VOCs, PHCs	**Soil:** BHMW16-4 **Ground Water:** BHMW16-4, BH/MW17-9, BH/MW17-11	**Soil:** Metals, VOCs, PHCs **Ground Water:** Metals, VOCs, PHCs	• EC	• Uranium • Chlorides
APEC 7: Gravel Parking Area- unknown quality fill	Metals, Inorganics,	**Soil:** BH6-6, BH16-7, BH17-10, BH16-13, TP16-1 to -13, BH16-14, BH/MW16-1, BH16-9 to -12 **Ground Water:** BH/MW16-1, BH/MW17-4	**Soil:** Metals, Inorganics **Ground Water:** Metals, Inorganics	• EC • Barium • Chromium	• None Identified

APEC	CoCs	Sample Locations	Parameters Analyzed	CoCs Identified in Soil	CoCs Identified in Ground Water
APEC 8: Use of Road salt on gravel parking area	Chloride, Sodium, EC, SAR	**Soil:** TP-16-1 to -13, BH6-6 to -7, BH16-9 to -14, BH17-10, BH/MW16-1 **Ground Water:** BH/MW16-1, BH/MW17-4	**Soil:** EC, SAR **Ground Water:** Chloride, Sodium	• EC • Barium • Chromium	• None Identified
APEC 9: Small gravel stockpile (near entrance gate); since remediated	PHCs, Metals	**Soil:** BH/MW17-7 **Ground Water:** BH/MW17-7	**Soil:** Metals & PHCs **Ground Water:** Metals & PHCs	• PHCs F3 and F4 (since remediated as of July 2017)	• None Identified
APEC 10: Large topsoil stockpile (NE property corner)	cyanide, Metals	**Soil:** BH16-17, TP16-14, BH16-16, BH/MW17-6, TP16-15, SP101 to SP115, SP301 to SP303 **Ground Water:** BH/MW17-6	**Soil:** Metals & cyanide **Ground Water:** Metals & cyanide	• Cyanide (above grade in topsoil stockpile only)	• None Identified
APEC 11: Former pump island and two diesel USTs (removed in 2015)	PHCs, VOCs, PAHs, inorganics	**Soil:** BH/MW16-2, BH/MW17-4 **Ground Water:** BH/MW16-2, BH/MW17-4	**Soil:** PHCs, VOCs, PAHs, inorganics **Ground Water:** PHCs, VOCs, PAHs, inorganics	• EC	• None Identified

APEC	CoCs	Sample Locations	Parameters Analyzed	CoCs Identified in Soil	CoCs Identified in Ground Water
APEC 12: Parking lot and areas grassed areas related to potential for agricultural pesticide use	Pesticides	**Soil:** BH16-7, BH16-8, BH16-12, BH16-13, SP203, BH16-17, BH16-15, **Ground Water:** MW16-1	**Soil:** pesticides **Ground Water:** pesticides	• None identified	• None identified
APEC 13: Ground Transformer	Pesticides, PHCs	**Soil:** BH18-5, BH18-6, BH18-7	**Soil:** PHC F1-F4, Pesticides	• None identified	• None identified

Legend:
CoC= Contaminants of Concern
EC = Electrical Conductivity
PAHs = polycyclic aromatic hydrocarbons
PHCs = petroleum hydrocarbons
SAR = sodium adsorption ratio
VOCs = volatile organic compounds

The following is a summary of additional information concerning APEC 1 and the structures present within the designation area, as well as the evaluated environmental concerns.

Maintenance Pit

The Maintenance Pit measures approximately 23m in length with a width of 1m and a depth of 1.4 m below grade. The pit is found on the west end of the garage and was formerly used to inspect the underside of the school buses and complete routine oil changes & lubrication and other maintenance. Used oil was directed to the inlet pipe within the north end of the pit for gravity drainage into the exterior waste oil underground tank (since removed in 2015). The south side of the pit contains an alcove where some small quantities of raw lubricants and motor oil were kept. The alcove inside the pit currently contains one 60 L drum of Shell Spirax 75W-90 gear oil.

The floor of the maintenance pit was found to be dry upon inspection with very little hydrocarbon staining observed.

Given the fact that the site has a shallow groundwater table (at approximately 0.5m below grade), if there were any cracks in the Maintenance Pit walls or bottom, water would start to infiltrate into this structure. Based on the site Phase I ESA and interviews, it is known that no water had historically or currently entered this Maintenance Pit. As such, there is no opportunity for any PHC products previously used in the Pit to have escaped and impacted the subsurface beneath the garage.

For the Phase Two ESA, borehole BH16-5 was placed to the east of the maintenance pit. Other than background concentrations of Co and V, no soil exceedances were observed nor were there any groundwater exceedances at this location in relation of MOE Table 7 criteria.

South Sump Pit

This structure contains a sump pump for the removal of water which could potentially infiltrate into the Maintenance Pit, based on the shallow water table found at this site. Based on the site Phase I ESA and interviews, it is known that no water had historically or currently entered the Maintenance Pit and that the South Sump Pit was never activated to remove infiltrating groundwater.

This sump pit measures approximately 1.6 m x 2.0 m and a depth of 2 m below grade. Architectural drawings for this Sump Pit indicate that it was furnished with a Hydromatic SP-40 4/10 HP with auto controller.

This South Sump Pit remained dry during inspections occurring in 2017 and a bare clean concrete bottom was observed at the base of the pit. On January 18, 2019, approximately 39 cm thickness of water was observed at the bottom of this pit. No staining and no environmental concerns were observed related to the South Sump Pit.

6 x interior garage Floor Drains

Each garage floor drain measures approximately 0.3 x 0.55 m in size with an invert depth of 0.9 m below grade. Typically, 0.45m depth of water was present inside each floor drain following inspections occurring on 18 January 2019. The floor drains are all interconnected and lead northward to the underground Floor Drain Holding Tank, after first progressing through the Floor Drain Sand/Oil interceptor. Our BH/MW17-1 was placed next to the northwest-most floor drain. Groundwater in MW17-1 was found to exceed for Chloride at 880 ug/L vs criterion of 790 ug/L in addition to a Uranium exceedance at 47 ug/L vs criterion of 20 ug/L. No other groundwater exceedances were noted at BH/MW17-1.

North Sump Pit

This structure measures approximately 0.75 x 0.75 cm in dimension and extends to 2.4 m bgs depth. Architectural drawings for the north sump pit indicate that it contains a Hydromatic SV-25 30 gpm sump pump (1/4 HP) complete with AutoControl. On 18 January 2019, the depth to water in the sump pit was approximately 2 mbgs even though the power had been shut off for the garage. This sump pit discharges into the Shop Floor Drains system via the Floor Drains Sand/Oil Interceptor sump. The un-perforated cover plate indicates that this sump is not meant to accept general garage floor washings.

An inlet pipe appeared to be present on the north side of the sump pit wall at a depth of approximately 0.8 m bgs. No staining and no environmental concerns were observed related to the North Sump Pit.

Floor Drains Sand/Oil Interceptor

The Sand/Oil interceptor unit for the Garage Floor Drains is configured as one sump pit measuring 80 x 60 cm in size and a 0.8m approximate bottom depth. Floor drain water contents were reviewed on 18 January 2019 and found to be clear water without any sheen or staining. The environmental conditions in the vicinity of this interceptor were investigated using BH/MW17-1. As noted above, groundwater in MW17-1 was found to exceed for Chloride at 880 ug/L vs criterion of 790 ug/L in addition to a Uranium exceedance at 47 ug/L vs criterion of 20 ug/L. No other groundwater exceedances were noted at BH/MW17-1.

This interceptor unit flows into the buried Shop Drains Holding Tank which is a buried fibreglass tank of 2,000 L capacity. No records were found on the frequency of Shop Drains Holding Tank pump out. The soil and groundwater conditions surrounding this exterior tank were investigated through use of boreholes BH/MW16-4, BH/MW17-9 and BH/MW17-11; as provided within the Phase Two ESA report.

Bus Wash Sand/Oil Interceptor

The Sand/Oil interceptor for the Bus Wash measures is configured as two separate sump pits. The northmost pit measures 105 x 105cm in size with an approximate depth of 2m bgs. The southmost pit had the same measurements. The un-perforated cover plate indicates that this sump is not meant to accept general garage floor washings.

This interceptor was used as a primary separation for the removal of grit following from the bus washing procedures. This interceptor unit would likely handle large quantities of soapy road grit-laden wash water. This interceptor unit empties into the exterior 45,000 L underground septic holding tank. Boreholes BH16-

8, BH18-4 and BH/MW17-3 were advanced next to the septic holding tank and found no evidence of contaminants (other than elevated Conductivity as well as Co and V in the native soils). Groundwater sampling at BH/MW17-3 did not exhibit any exceedances.

Bus Wash Floor Drain

The elongated floor drain in the Bus Wash measures approximately 15m in length with a width of 0.3m and a depth varying between 0.24 to 0.16 m bgs. This drain was used as a primary collection point for used wash water in the Bus Wash. We expect that bus wash residues entering this floor drain would include large quantities of water and detergents with smaller quantities of road salt, grit and grime with traces of lubricating oil/grease. No staining and no environmental concerns were observed related to this Bus Wash Floor Drain. This floor drain was connected to the exterior 45,000 L underground septic holding tank after first passing through the bus wash sand/oil interceptor unit.

Environmental borehole BH/MW17-2 was placed on the south side of the Bus Wash floor drain. No environmental concerns were observed in soil or in groundwater at this sampling location.

The property owner is planning on demolishing the current garage building once a RSC can be obtained for the subject property. Arcadis has indicated the need to complete supplemental environmental verification sampling at the underside of building slab during or following demolition activities and following the removal of the remaining holding tanks (shop drain UST and the septic holding tank).

No other current or former activities on lands within the Phase One ESA study area were assessed as having the potential for affecting the environmental quality of the Phase One ESA property. The rationale for the APECs is listed in the Phase One ESA report. A schematic CSM for the Phase Two ESA is provided as **Figure 24**.

6.13.2 Subsurface Structures and Utilities

It has been determined that utilities typically associated with municipal services are not present at the subject property. The site building had been serviced with its own drinking water well, its own on-site private septic waste system and holding tanks for sanitary services and drains as well as an underground tank for waste oils. Underground gas lines were not present as propane was used. Electrical service was overhead except between the box transformer and the site building.

Immediately neighbouring residential uses to the east and south are supplied with municipal water and sewer in addition to hydro and natural gas utilities.

The site building was formerly serviced with propane for heating purposes via a large aboveground storage supply tank. Hydro electric service and telephone wiring connect via overhead lines to the building. There are no storm sewer catch basins present within the parking area and storm water is permitted to infiltrate into the gravel surfacing or sheet runoff to nearby ditch structures or swales.

The approximate locations of underground utilities (septic tank and holding tank) are found on **Figure 3**. Due to the absence of underground services leading onto the Site, there was not expected to be the potential for conduits for migration of contaminants in soil and ground water due to bedding surrounding underground utilities.

6.13.3 Physical Setting

The stratigraphy of the Site typically consists of gravel to gravelly sand fill over native sand, clayey silt to clay. No bedrock was encountered at the maximum depth of the boreholes advanced (4.88 m bgs). Fill layers extended to a maximum depth of 1.31 m below grade. The native clay layer was encountered at a minimum depth of 0.43 m below grade.

The SCS for use in evaluating soil and ground water conditions at the Site were selected from the MECP "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*" dated April 15, 2011 (MECP, 2011a) using the approach prescribed by Ontario Regulation 153/04 (O. Reg. 153/04, as amended). The following site-specific information was used to select the SCS for use at the Site:

- The property is not an environmentally sensitive area since (with reference to O.Reg. 153/04; Section 41 and 43.1) as the pH of on-site soils are found within the range of 5 to 9; the Site is not within an area of natural significance, nor does it include or is it adjacent to an area of natural significance, nor does it include lands that are within 30 m of an area of natural significance (O.Reg. Section 41); and the Site is not considered a "shallow soil property" as more than two thirds of the property has more than 2 m of overburden (O.Reg. Section 43.1).

- The immediately surrounding area is serviced by a municipal drinking water system which in turn obtains water from the Ottawa River. The former on-site drinking water well was decommissioned in September 2016. There is the potential that at least four neighboring properties could possibly remain on private drinking water wells located within 250 m of the site (based on records from the City of Ottawa): 777, 793 and 805 Safari Court as well as at 1869 Trim Road. A summary of potable wells found within the Study Area was provided in the Phase One ESA report by Arcadis;

- The Site is under commercial land use currently although may likely be sold for redevelopment as a residential land use;

- Soil is classified as medium to fine textured, based on the results of field observations made during the field program and the results of grain size analyses/ grain size curves completed on soil samples.

One on-site drinking water well was present on the Phase Two Property and was decommissioned in September 2016, under the supervision of Arcadis staff. This water well was not used by former bus maintenance staff for drinking water but for vehicle wash water and plumbing/toilet uses only.

Based on the above information, the applicable generic SCSs selected for use at the Site as it exists correspond to the generic SCSs for ICC property use and medium/fine textured soil in a potable ground water condition (i.e. the MECP Table 2 ICC SCSs; MECP, 2011a). However, as the Site is to be redeveloped for a residential land use, and as the ground water table was found to be relatively shallow at less than 3 m depth, reference was made to MECP Table 6 (potable) SCSs to evaluate PHCs F1 and F2 and VOCs/BTEX contaminants in both soil and ground water.

Other than fill materials within the entire gravel parking area (including the small gravel stockpile) {APEC 7 and 9}, which were identified as fill materials of unknown origin (O.Reg. 153/04 Schedule D, Table 2-PCA# 30), and the clean backfill used in 2015 around the remediation of the former diesel and waste oil UST areas, fill materials brought to the Site from another property have not been identified.

6.13.4 Soil Quality

Elevated concentrations of cobalt and vanadium were encountered in both the upper 1.5 m soil horizon and also at depths greater than 1.5 m bgs. It was inferred that these elevated concentrations were related to natural background conditions, based on the multiple lines of evidence outlined in Section 6.7 above.

In relation to the MECP Table 6 SCSs (applicable to a residential land use), isolated exceedances of barium were detected in surface soil at the BH16-6, BH16-11, TP16-4, TP16-5 and TP16-11 locations. Chromium exceeded the MECP Table 6 SCS in surface soil at the BH16-13 location.

Elevated concentrations of free cyanide above the applicable SCS was detected in samples collected throughout the large above-grade topsoil berm/stockpile present at the northeast corner of the property. In March 2018, three (3) soil samples were collected from within 1 metre below the stockpile in native soils and analyzed for cyanide. Cyanide was not detected in any of these samples. As such, elevated cyanide concentrations are restricted to the soil within the large topsoil stockpile.

A sample collected from the smaller granular materials stockpile, located near the entrance to the site, contained a concentration of F3 PHCs in excess of the Table 6 SCS (at 1,400 ug/g vs. criterion of 1,300 ug/g). Note that this small gravel was removed for off-site landfill disposal in July 2017.

EC was observed to exceed the applicable Table 6 SCS from 0.30 m bgs to a maximum depth of 3.35 m bgs at 10 test pit and 10 borehole locations.

In comparison with the MECP Table 6 residential SCSs, no exceedances were observed in any soil samples for the following analytical parameters:

- PAHs;
- F1 to F4 PHCs- aside from F3 PHC within the small stockpile (removed in July 2017);
- VOCs (including BTEX); and,
- Pesticides.

6.13.5 Ground Water Quality

In comparison with the MECP Table 6 residential SCSs, two Metals/ Inorganics exceedances were noted for the following parameters: Uranium and Chloride. No known source of uranium was found related to school bus maintenance operations. Chlorides in groundwater may be related to use of road salts and school bus wash activities within the garage.

No exceedances were observed in any ground water samples for the following analytical parameters:

- PAHs;

- F1 to F4 PHCs;
- VOCs (including BTEX);
- Glycol; and,
- Pesticides.

6.13.6 Vapour Intrusion

As VOC and BTEX concentrations were less than the applicable SCSs, there was no expected concern with regard to vapour intrusion for existing or proposed site buildings.

6.13.7 Contaminant Pathways and Receptors

There are no areas of natural significance located within 250 m of the boundaries of the Phase Two Property. One drinking water well was present on the Phase Two Property and it was decommissioned in September 2016.

The CSM for Human Receptors (**Figure 25**) and the CSM for Ecological Receptors (**Figure 26**) present the potential pathways for environmental risk/exposure for the Site. As shown on the CSM for Human Receptors, all pathways applicable to potable sites provide potential exposure to Site contaminants. These pathways are:

- inhalation of dust and vapour;
- ingestion of soil;
- dermal contact with soil.

Similarly, all potential exposure pathways exist at the subject property for Ecological Receptors, as shown in the CSM. These pathways are:

- uptake from soil
- direct contact with soil
- inhalation of dust and vapour
- intake of food/soil

It is not believed that climatic or meteorological conditions have influenced the distribution or migration of contaminants in soil.

6.13.8 Proposed Future Land Use

The proposed future land use of the subject property is a residential land use. It is assumed that the proposed residential use will include the need for circulation roads, sidewalks and driveways. These hard-surfacing materials would likely serve to limit exposure to any soil contaminants.

7 CONCLUSIONS

7.1 Site Characterization

The Site, which was formerly operated as a school bus maintenance garage with offices, includes the following infrastructure: a main office building with attached school bus maintenance garage, a holding tank for shop drains, a septic waste system and a school bus parking lot (**Figures 3 and 4**). Formerly, a propane tank area was present in addition to a diesel fuel island and dispenser with two connecting diesel USTs as well as a waste oil UST were present. The diesel fuel USTs and waste oil UST were removed in 2015. Verification sample results from others confirm that all residual PHCs in soil were removed and met applicable SCSs.

As the majority of soils encountered at the Site consist of native silty clay to silt or clayey silt to clay, it was observed that the medium-fine textured soil standards are applicable to the Site. This observation was supported by grain size curves and grain size analyses. As such, the applicable MECP site standards used were those from Table 6 *Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition* for Fine Textured Soils and Residential/Parkland/Institutional Property Use, as listed in the *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* as part of Ontario Reg. 153/04 (revised 15 April 2011).

As the existing land use is commercial in nature and future land use is planned to be residential, a Record of Site Condition (RSC) will need to be acknowledged by the MECP in order to proceed with any future residential land use development.

7.2 Soil Quality

Various metals and inorganic COCs were noted to be elevated in comparison with the MECP Table 6 Standards, including: free cyanide, barium, and chromium at isolated locations. The sources of these contaminants could not be determined.

Elevated concentrations of EC were found across much of the property (in shallow soils at 5 boreholes and 12 test pits and in soils at depths greater than 1.5 m bgs in 6 borehole locations). It is inferred that these conductivity exceedances are related to the former use of salt as a roadway/parking lot de-icing

agent. The MECP views elevated EC having a potential effect on the viability of future plant growth and, as such, there are no concerns with respect to elevated EC at depths greater than 1.5 m bgs.

Elevated levels of cobalt and vanadium were encountered in both shallow overburden and deeper native soils. Based on multiple lines of evidence, it was inferred that the elevated concentrations in these two parameters may be related to natural background conditions.

Concentrations of F3 were reported to be greater than the MECP Table 6 SCS in the sample collected from the small stockpile (SP203), located near the entrance gate. The source of this granular stockpile material was inferred to be related to the accumulation of winter plowing residues and surface scrapings and/or surplus raw granular for infilling of parking area potholes. Note that this small gravel stockpile was removed under Arcadis supervision for landfill disposal in July 2017.

Elevated cyanide is a common contaminant associated with pesticide application at apple or other soft fruit orchards and is usually confined to the topsoil or underlying shallow soil. Cyanide may be persistent in the soil remaining long after pesticide application has ceased. The Phase One ESA did not indicate the presence of any orchards on or adjacent to the subject property nor were any pesticides identified in soil or groundwater exceeding MECP SCSs. Natural biogenic processes of bacteria, fungi, and cyanogenic plants such as sorghum, soybeans, and cassava, are known to release cyanide into the soil (EPA 1978c; Knowles 1988; WHO 1992, 2004). Overall, the cyanide concentrations in soil are relatively low and the use of risk assessment/risk management may be the best approach to resolve risks from such contaminants.

In comparison with the MECP Table 6 residential SCSs, no exceedances were observed in any soil samples for the following analytical parameters:

- PAHs;
- PHCs/VOCs (including BTEX); and,
- Pesticides.

7.3 Ground Water Quality

In comparison with the MECP Table 6 Potable Ground Water Condition SCSs, the only parameters observed to exceed in groundwater were uranium and chloride. Otherwise, no exceedances were observed in any ground water samples for the following analytical parameters:

- Metals/ inorganics;
- PAHs;
- F1 to F4 PHCs;
- VOCs (including BTEX);
- Glycol; and,
- Pesticides.

7.4 Recommendations

Based on the presence of various soil contaminants, the following recommendations are provided:

i) A MECP modified generic risk assessment (MGRA) should be conducted for the subject site to review the maximum contaminant concentrations, pathways, and potential contaminant exposure levels. The risk assessment would provide risk management measures, as needed, to reduce risk of contaminant exposure and environmental impacts to human health and ecological receptors.

ii) The MECP will need to be contacted and an acknowledgement will be required from the MECP in order to refer to the observed concentrations of cobalt and vanadium in soil as reflective of natural background concentrations, based on the multiple lines of evidence provided within this Phase Two ESA report;

iii) The isolated areas of barium and chromium could be excavated and removed for off-site disposal. Excavation confirmation sampling following the remediation program can be used to confirm the absence of these two metals contaminants. As an alternative, the instances of these two elements may be reviewed as part of a site-specific risk assessment and risk mitigation measures could perhaps be employed to eliminate the hazard posed by the elevated barium and chromium parameters;

iv) The surficial soil areas showing elevated EC could be remediated by removal of the upper horizon of fill and native soil. Alternatively, a risk assessment approach could be employed to evaluate the risks of impaired plant growth due to the elevated conductivity concentrations. There are no SCSs for EC in soils at depths greater than 1.5 m under the Table 3 SCS as EC is a concern only affecting surficial plant growth. The Electrical Conductivity

exceedances appear to be limited to where gravel parking is found across the Site. EC exceedances were not detected at the northeast undeveloped corner of the Site. EC was delineated vertically with the maximum depth of EC exceedance found in the native clay at BH16-4-2 (3.35 m bgs) and the observation that EC met the Table 6 EC Standard at nearby BH18-3 at 3.5 m bgs. EC results are inferred to be biased high based on the presence of the shallow groundwater table across the Site.

No contaminants were detected in ground water at the Phase Two ESA property other than uranium and chloride.

In summary, it is the opinion of the Qualified Person that the identified contaminated soils should be reviewed within the scope of a modified generic risk assessment. The risk assessment would provide risk management measures, if necessary, to deal with the observed elevated concentrations of EC, barium, chromium and one instance of elevated F3 fraction PHCs. It is expected that elevated vanadium and cobalt concentrations should be designated as reflective of a natural background condition, following from MECP review and approvals.

A notification letter was sent to the City Clerk at the City of Ottawa to advise on the intention to utilize the MECP Table 6 SCS (potable ground water situation) for evaluation of the subject property.

7.5 Signatures

This Phase II ESA was completed in accordance with the provisions of O. Reg. 153/04, as amended. The qualified person attests to the validity of data and the data gathering methods.

The field investigation program, data review and evaluation, and reporting was completed under the supervision of Mr. Troy Austrins, P.Eng, QP_{ESA}. The report was prepared by Mr. Austrins with the assistance of Ms. Stephanie Joyce, M.Sc., C.Chem., Lennart de Groot, B.Sc., EP and Nancy Haywood, A.Sc.T. Senior review was provided by Mr. Barry H. Cooke, P.Eng, QP_{ESA}. Messrs. Austrins and Cooke are registered with the MECP as a qualified person (QP) with respect to the completion of Phase I and II Environmental Site Assessments as per O. Reg. 153/04. A resume detailing the qualifications and technical experience of the site assessor is included in **Appendix H**.

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9 TABLES AND FIGURES

9.1 Tables

Aside from the notations below, the following tables are provided in this section:

Table 9.1 Soil Analytical Results – PHCs and VOCs

Table 9.2 Soil Analytical Results – Metals and Inorganics

Table 9.3 Soil Analytical Results – Pesticides-Herbicides, PCBs

Table 9.4 Soil Analytical Results – PAHs

Table 9.5 Soil Analytical Results – FOC

Table 9.6 Soil Analytical Results – Grain Size

Table 9.7 Soil Analytical Results – TCLP

Table 9.8A Monitoring Well Data – February 2016

Table 9.8B Monitoring Well Data – May 2016

Table 9.8C Monitoring Well Data- September 2017

Table 9.8D Monitoring Well Data- September 201

Table 9.9 Ground Water Analytical Results – PHCs and VOCs

Table 9.10 Ground Water Analytical Results – Metals and Inorganics

Table 9.11 Ground Water Analytical Results – Pesticides

Table 9.12 Ground Water Analytical Results – PAHs

Table 9.13 Ground Water Analytical Results – Glycol

Table 9.14 Soil Analytical Results – Maximum Concentrations

Table 9.15 Ground Water Analytical Results – Maximum Concentrations

- Note: no light or dense non-aqueous phase liquids (LNAPL or DNAPLs) were detected in any of the monitoring wells at the Site. As such, a table has not been provided summarizing LNAPLs and DNAPLs.

9.2 Figures

The following figures and drawings are provided in this section. As no Areas of Natural Significance and water bodies are present on, adjacent to or within 30 m of the subject property, a figure has not been provided showing these areas.

Figure 1 Key Plan
Figure 2 Topography and Surface Water Plan
Figure 3 Site Plan- Test Pit / Borehole/ Monitoring Well Locations
Figure 4 Location of Excavations
Figure 5 a,b,c Interpreted Shallow Horizontal Ground Water Flow Direction (a)-Feb. 2016; b)- May 2016, c) Sept. 2017)
Figure 6 Location of Potentially Contaminating Activities (PCAs) and Areas of Potential Environmental Concern (APEC)
Figure 6b Building Detail
Figure 7 Soil Contaminant Distribution Plan- Inorganics
Figure 8 Soil Contaminant Distribution Plan- Conductivity
Figure 9a Soil Contaminant Distribution Plan- Free Cyanide
Figure 9b Soil Contaminant Distribution Plan- Cross Section S-S'- Free Cyanide (Topsoil Stockpile)
Figure 10 Soil Contaminant Distribution Plan- Metals
Figure 11 Soil Contaminant Distribution Plan- Barium
Figure 12 Soil Contaminant Distribution Plan- Chromium
Figure 13 Soil Background Levels - Cobalt
Figure 14 Soil Background Levels- Vanadium
Figure 15 Soil Contaminant Distribution Plan- PHCs/ VOCs

Figure 15b Cross Section SS-SS'; Small gravel stockpile- PHCs/ VOCs
Figure 16 Soil Contaminant Distribution Plan- PAHs
Figure 17 Soil Contaminant Distribution Plan- Pesticides/Herbicides
Figure 18 Groundwater Contaminant Distribution Plan- Metals and Inorganics
Figure 19 Groundwater Contaminant Distribution Plan- Uranium
Figure 20 Groundwater Contaminant Distribution Plan- Chloride
Figure 21 Groundwater Sampling Plan and Results – PHCs and VOCs
Figure 22 Groundwater Sampling Plan and Results – PAHs
Figure 23 Groundwater Sampling Plan and Results – Pesticides and Herbicides
Figure 24 Phase Two ESA Conceptual Site Model
Figure 25 Conceptual Site Model- Human Receptors
Figure 26 Conceptual Site Model- Ecological Receptors
Figure 27 Cross Section AA' (Conductivity)
Figure 28 Cross Section BB' (Conductivity)
Figure 29 Cross Section AA' (Free Cyanide)
Figure 30 Cross Section BB' (Free Cyanide)
Figure 31 Cross Section AA' (Barium)
Figure 32 Cross Section BB' (Barium)
Figure 33 Cross Section AA' (Chromium)
Figure 34 Cross Section BB' (Chromium)
Figure 35 Cross Section AA' (Groundwater – Chloride and Uranium)
Figure 36 Cross Section BB' (Groundwater – Chloride and Uranium)
Figure 37 Off-site Drinking Water Well Locations
Figure 38 Grain Size Sampling Locations
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TABLES

Table 9.1
SOIL ANALYTICAL RESULTS - PHCs and VOCs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH16-1-1	BH16-1-2	BH16-2-1	BH16-2-2	DUP-1	RPD	BH16-3-1	BH16-3-2	BH16-4-1	BH16-4-2
Laboratory Sample No.	na	na	na	BVI227	BVI226	BVI225	BVI224	BVI228	na	BVI214	BVI213	BVI212	BVI211
Date Sampled	na	na	na	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	na	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16
Sample depth (m bgs)	na	na	na	1.22	3.35	0.46	3.2	3.2	na	0.3	3.2	0.3	3.35
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	na	<5	<5	<5	<5
Borehole No.	na	na	na	BH16-1	BH16-1	BH16-2	BH16-2	BH16-2	na	BH16-3	BH16-3	BH16-4	BH16-4
Volatile Organics													
1,3-Dichloropropene (cis+trans)	0.050	µg/g	0.081	-	-	-	-	-		-	-	-	-
Acetone (2-Propanone)	0.50	µg/g	28	<0.50	<0.50	<0.50	<1.0	<1.0	nc	<0.50	<1.0	<0.50	<0.50
Benzene	0.020	µg/g	0.17	<0.020	<0.020	<0.020	<0.040	<0.040	nc	<0.020	<0.040	<0.020	<0.020
Bromodichloromethane	0.050	µg/g	1.9	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Bromoform	0.050	µg/g	0.26	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Bromomethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
Carbon Tetrachloride	0.050	µg/g	0.12	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Chlorobenzene	0.050	µg/g	2.7	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Chloroform	0.050	µg/g	0.18	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Dibromochloromethane	0.050	µg/g	2.9	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,2-Dichlorobenzene	0.050	µg/g	1.7	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,3-Dichlorobenzene	0.050	µg/g	6	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,4-Dichlorobenzene	0.050	µg/g	0.097	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
Dichlorodifluoromethane (FREON 12)	0.050	µg/g	25	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,1-Dichloroethane	0.050	µg/g	0.6	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,2-Dichloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
1,1-Dichloroethylene	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
cis-1,2-Dichloroethylene	0.050	µg/g	2.5	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
trans-1,2-Dichloroethylene	0.050	µg/g	0.75	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,2-Dichloropropane	0.050	µg/g	0.085	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
cis-1,3-Dichloropropene	0.030	µg/g	na	<0.030	<0.030	<0.030	<0.060	<0.060	nc	<0.030	<0.060	<0.030	<0.030
trans-1,3-Dichloropropene	0.040	µg/g	na	<0.040	<0.040	<0.040	<0.080	<0.080	nc	<0.040	<0.080	<0.040	<0.040
Ethylbenzene	0.020	µg/g	1.6	<0.020	<0.020	<0.020	<0.040	<0.040	nc	<0.020	<0.040	<0.020	<0.020
Ethylene Dibromide	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
Hexane	0.050	µg/g	34	<0.050	<0.050	0.084	<0.10	<0.10	nc	<0.050	<0.10	0.11	<0.050
Methylene Chloride(Dichloromethane)	0.050	µg/g	0.96	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Methyl Ethyl Ketone (2-Butanone)	0.50	µg/g	44	<0.50	<0.50	<0.50	<1.0	<1.0	nc	<0.50	<1.0	<0.50	<0.50
Methyl Isobutyl Ketone	0.50	µg/g	4.3	<0.50	<0.50	<0.50	<1.0	<1.0	nc	<0.50	<1.0	<0.50	<0.50
Methyl t-butyl ether (MTBE)	0.050	µg/g	1.4	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Styrene	0.050	µg/g	2.2	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
Tetrachloroethylene	0.050	µg/g	2.3	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Toluene	0.020	µg/g	6	<0.020	<0.020	0.024	<0.040	<0.040	nc	<0.020	<0.040	0.025	<0.020
1,1,1-Trichloroethane	0.050	µg/g	3.4	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
1,1,2-Trichloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	**<0.10**	**<0.10**	nc	<0.050	**<0.10**	<0.050	<0.050
Trichloroethylene	0.050	µg/g	0.52	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Trichlorofluoromethane (FREON 11)	0.050	µg/g	5.8	<0.050	<0.050	<0.050	<0.10	<0.10	nc	<0.050	<0.10	<0.050	<0.050
Vinyl Chloride	0.020	µg/g	0.022	<0.020	<0.020	<0.020	**<0.040**	**<0.040**	nc	<0.020	**<0.040**	<0.020	<0.020
p+m-Xylene	0.020	µg/g	na	<0.020	<0.020	0.025	<0.040	<0.040	nc	<0.020	<0.040	0.029	<0.020
o-Xylene	0.020	µg/g	na	<0.020	<0.020	<0.020	<0.040	<0.040	nc	<0.020	<0.040	<0.020	<0.020
Total Xylenes	0.020	µg/g	25	<0.020	<0.020	0.025	<0.040	<0.040	nc	<0.020	<0.040	0.029	<0.020
BTEX & F1 Hydrocarbons													
F1 (C6-C10)	10	µg/g	65	<10	<20	<20	<30	<20	nc	<10	<20	<10	<20
F1 (C6-C10) - BTEX	10	µg/g	65	<10	<20	<20	<30	<20	nc	<10	<20	<10	<20
F2-F4 Hydrocarbons													
F2 (C10-C16 Hydrocarbons)	10	µg/g	150	<10	<10	<10	<20	<10	nc	<10	<10	<10	<10
F3 (C16-C34 Hydrocarbons)	50	µg/g	1300	<50	<50	<50	<100	<50	nc	<50	<50	<50	<50
F4 (C34-C50 Hydrocarbons)	50	µg/g	5600	<50	<50	<50	<100	<50	nc	<50	<50	<50	<50

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

µg/g micrograms per gram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommendations are RPDs < 30% for PHCs in water and soil; <30% for VOCs in water and <50% VOCs in soil
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL or adjusted RDL
< #### Adjusted RDL exceeds the selected MOECC SCS

VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS or has an elevated MDL

Columns shaded grey (SP203 and duplicate) are sample locations which have since been removed from the site

Table 9.1
SOIL ANALYTICAL RESULTS - PHCs and VOCs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH16-5-1	BH16-5-2	BH16-6-1	BH16-7-1	BH16-8-1	BH16-9-1	BH16-10-1	BH16-12-1	BH16-13-1	BH16-14-1	DUP-2	RPD	BH16-15-1	BH16-17-1	SP203	DUP-6	RPD	BH17-1-2
Laboratory Sample No.	na	na	na	BWG388	BWG389	BWJ272	BWJ270	BWJ304	BWJ268	BWG382	BWJ266	BWG386	BWJ264	BWJ306	na	BVI210	BVI206	CIZ148	CIZ150	na	EIW970
Date Sampled	na	na	na	16-Feb-16	16-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	16-Feb-16	17-Feb-16	16-Feb-16	17-Feb-16	17-Feb-16	na	9-Feb-16	9-Feb-16	12-May-16	12-May-16	na	9-May-17
Sample depth (m bgs)	na	na	na	1.07	4.27	0.3	0.3	1.22	0.3	1.37	1.22	1.07	1.07	1.07	na	1.07	1.07	0.5	0.5	na	0.76 - 1.5
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	<5	<5	na	na	na	20
Borehole No.	na	na	na	BH16-5	BH16-5	BH16-6	BH16-7	BH16-8	BH16-9	BH16-10	BH16-12	BH16-13	BH16-14	BH16-14	na	BH16-15	BH16-17	SP203	SP203	na	BH17-1
Volatile Organics																					
1,3-Dichloropropene (cis+trans)	0.050	µg/g	0.081	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	<0.050
Acetone (2-Propanone)	0.50	µg/g	28	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	nc	<0.50
Benzene	0.020	µg/g	0.17	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	nc	<0.020
Bromodichloromethane	0.050	µg/g	1.9	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Bromoform	0.050	µg/g	0.26	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Bromomethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Carbon Tetrachloride	0.050	µg/g	0.12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Chlorobenzene	0.050	µg/g	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Chloroform	0.050	µg/g	0.18	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Dibromochloromethane	0.050	µg/g	2.9	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,2-Dichlorobenzene	0.050	µg/g	1.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,3-Dichlorobenzene	0.050	µg/g	6	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,4-Dichlorobenzene	0.050	µg/g	0.097	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Dichlorodifluoromethane (FREON 12)	0.050	µg/g	25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,1-Dichloroethane	0.050	µg/g	0.6	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,2-Dichloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,1-Dichloroethylene	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
cis-1,2-Dichloroethylene	0.050	µg/g	2.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
trans-1,2-Dichloroethylene	0.050	µg/g	0.75	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,2-Dichloropropane	0.050	µg/g	0.085	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
cis-1,3-Dichloropropene	0.030	µg/g	na	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	nc	<0.030	<0.030	<0.030	<0.030	nc	<0.030
trans-1,3-Dichloropropene	0.040	µg/g	na	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	nc	<0.040	<0.040	<0.040	<0.040	nc	<0.040
Ethylbenzene	0.020	µg/g	1.6	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	nc	<0.020
Ethylene Dibromide	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Hexane	0.050	µg/g	34	<0.050	<0.050	0.054	0.063	<0.050	0.13	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Methylene Chloride(Dichloromethane)	0.050	µg/g	0.96	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Methyl Ethyl Ketone (2-Butanone)	0.50	µg/g	44	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	nc	<0.50
Methyl Isobutyl Ketone	0.50	µg/g	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	nc	<0.50
Methyl t-butyl ether (MTBE)	0.050	µg/g	1.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Styrene	0.050	µg/g	2.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,1,1,2-Tetrachloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,1,2,2-Tetrachloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Tetrachloroethylene	0.050	µg/g	2.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Toluene	0.020	µg/g	6	<0.020	<0.020	<0.020	<0.020	<0.020	0.041	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	0.023	nc	<0.020
1,1,1-Trichloroethane	0.050	µg/g	3.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
1,1,2-Trichloroethane	0.050	µg/g	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Trichloroethylene	0.050	µg/g	0.52	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Trichlorofluoromethane (FREON 11)	0.050	µg/g	5.8	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	nc	<0.050
Vinyl Chloride	0.020	µg/g	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	nc	<0.020
p+m-Xylene	0.020	µg/g	na	<0.020	<0.020	<0.020	<0.020	<0.020	0.057	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	0.026	nc	<0.020
o-Xylene	0.020	µg/g	na	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	nc	<0.020
Total Xylenes	0.020	µg/g	25	<0.020	<0.020	<0.020	<0.020	<0.020	0.057	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	0.026	nc	<0.020
BTEX & F1 Hydrocarbons																					
F1 (C6-C10)	10	µg/g	65	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	nc	<20	<10	<10	<10	nc	<10
F1 (C6-C10) - BTEX	10	µg/g	65	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	nc	<20	<10	<10	<10	nc	<10
F2-F4 Hydrocarbons																					
F2 (C10-C16 Hydrocarbons)	10	µg/g	150	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	nc	<10	<10	11	23	nc	<10
F3 (C16-C34 Hydrocarbons)	50	µg/g	1300	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	nc	<50	<50	**1400**	**1900**	30%	<50
F4 (C34-C50 Hydrocarbons)	50	µg/g	5600	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	nc	<50	<50	4600	**6300**	31%	<50

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soi
Sediment Standards for Use Under Part XV.1 of the Environmental Prot
April 15, 2011. Table 6: Generic Site Condition Standards for Shallow S
Ground Water Condition for Fine Textured Soils and Residential/Parkla
Property Use

µg/g micrograms per gram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommendations are RPDs < 30
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL or adjusted RDL
< #### Adjusted RDL exceeds the selected MOECC SCS

VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS or has an eleva

Columns shaded grey (SP203 and duplicate) are sample locations whic

Table 9.1
SOIL ANALYTICAL RESULTS - PHCs and VOCs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH17-2-2	BH17-3-2	DUP-1	RPD	BH17-4-2	BH17-5-1	BH17-6-1	BH17-7-1	BH17-8-2	BH17-9-1	BH18-5	DUP-3	RPD	BH18-6	BH18-7
Laboratory Sample No.	na	na	na	EIW971	EIW952	EIW953	na	EIW969	EIW954	EIW956	EIW959	EIW951	EIW950	GGD036	GGD066	na	GGD037	GGD038
Date Sampled	na	na	na	9-May-17	9-May-17	9-May-17	na	9-May-17	9-May-17	9-May-17	9-May-17	9-May-17	9-May-17	13-Mar-18	13-Mar-18	na	13-Mar-18	13-Mar-18
Sample depth (m bgs)	na	na	na	1.5 - 2.3	0.76 - 1.5	0.76 - 1.5	na	0.76 - 1.5	0 - 0.76	0 - 0.76	0 - 0.76	0.76 - 1.5	0 - 1.5	0.0 - 0.50	0.0 - 0.50	na	0.0 - 0.50	0.0 - 0.65
CGM Reading (ppmv)	na	na	na	5	10	10	na	10	<5	5	<5	10	<5	na	na	na	na	na
Borehole No.	na	na	na	BH17-2	BH17-3	BH17-3	na	BH17-4	BH17-5	BH17-6	BH17-7	BH17-8	BH17-9	BH18-5	BH18-5	na	BH18-6	BH18-7
Volatile Organics																		
1,3-Dichloropropene (cis+trans)	0.050	µg/g	0.081	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Acetone (2-Propanone)	0.50	µg/g	28	<0.50	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Benzene	0.020	µg/g	0.17	<0.020	<0.02	<0.02	nc	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.040	<0.040	nc	<0.040	<0.040
Bromodichloromethane	0.050	µg/g	1.9	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Bromoform	0.050	µg/g	0.26	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Bromomethane	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Carbon Tetrachloride	0.050	µg/g	0.12	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Chlorobenzene	0.050	µg/g	2.7	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Chloroform	0.050	µg/g	0.18	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Dibromochloromethane	0.050	µg/g	2.9	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,2-Dichlorobenzene	0.050	µg/g	1.7	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,3-Dichlorobenzene	0.050	µg/g	6	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,4-Dichlorobenzene	0.050	µg/g	0.097	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Dichlorodifluoromethane (FREON 12)	0.050	µg/g	25	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,1-Dichloroethane	0.050	µg/g	0.6	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,2-Dichloroethane	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,1-Dichloroethylene	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
cis-1,2-Dichloroethylene	0.050	µg/g	2.5	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
trans-1,2-Dichloroethylene	0.050	µg/g	0.75	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,2-Dichloropropane	0.050	µg/g	0.085	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
cis-1,3-Dichloropropene	0.030	µg/g	na	<0.030	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
trans-1,3-Dichloropropene	0.040	µg/g	na	<0.040	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Ethylbenzene	0.020	µg/g	1.6	<0.020	<0.02	<0.02	nc	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.040	<0.040	nc	<0.040	<0.040
Ethylene Dibromide	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Hexane	0.050	µg/g	34	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Methylene Chloride(Dichloromethane)	0.050	µg/g	0.96	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50	µg/g	44	<0.50	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Methyl Isobutyl Ketone	0.50	µg/g	4.3	<0.50	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Methyl t-butyl ether (MTBE)	0.050	µg/g	1.4	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Styrene	0.050	µg/g	2.2	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,1,1,2-Tetrachloroethane	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,1,2,2-Tetrachloroethane	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Tetrachloroethylene	0.050	µg/g	2.3	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Toluene	0.020	µg/g	6	<0.020	<0.02	<0.02	nc	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.040	<0.040	nc	<0.040	<0.040
1,1,1-Trichloroethane	0.050	µg/g	3.4	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
1,1,2-Trichloroethane	0.050	µg/g	0.05	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Trichloroethylene	0.050	µg/g	0.52	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Trichlorofluoromethane (FREON 11)	0.050	µg/g	5.8	<0.050	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
Vinyl Chloride	0.020	µg/g	0.022	<0.020	-	-	nc	-	-	-	-	-	-	-	-	nc	-	-
p+m-Xylene	0.020	µg/g	na	<0.020	<0.04	<0.04	nc	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.080	<0.080	nc	<0.080	<0.080
o-Xylene	0.020	µg/g	na	<0.020	<0.02	<0.02	nc	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.040	<0.040	nc	<0.040	<0.040
Total Xylenes	0.020	µg/g	25	<0.020	<0.04	<0.04	nc	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.080	<0.080	nc	<0.080	<0.080
BTEX & F1 Hydrocarbons																		
F1 (C6-C10)	10	µg/g	65	<10	<10	<10	nc	<10	<10	<10	<10	<10	<10	<20	<20	nc	<20	<20
F1 (C6-C10) - BTEX	10	µg/g	65	<10	<10	<10	nc	<10	<10	<10	<10	<10	<10	<20	<20	nc	<20	<20
F2-F4 Hydrocarbons																		
F2 (C10-C16 Hydrocarbons)	10	µg/g	150	<10	<10	<10	nc	<10	<10	<10	<10	<10	<10	<10	<10	nc	<10	<10
F3 (C16-C34 Hydrocarbons)	50	µg/g	1300	<50	<50	<50	nc	<50	-	-	<50	<50	<50	69	60	nc	<50	64
F4 (C34-C50 Hydrocarbons)	50	µg/g	5600	<50	<50	<50	nc	<50	-	-	<50	<50	<50	<50	<50	nc	<50	<50

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soi
Sediment Standards for Use Under Part XV.1 of the Environmental Prot
April 15, 2011. Table 6: Generic Site Condition Standards for Shallow S
Ground Water Condition for Fine Textured Soils and Residential/Parkla
Property Use

µg/g micrograms per gram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommendations are RPDs < 30
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL or adjusted RDL
< #### Adjusted RDL exceeds the selected MOECC SCS

VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS or has an eleva

Columns shaded grey (SP203 and duplicate) are sample locations whic

Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH16-1-1	BH16-1-2	BH16-2-1	BH16-2-2	DUP-1	RPD	BH16-3-1	BH16-3-2
Laboratory Sample No.	na	na	na	BVI227	BVI226	BVI225	BVI224	BVI228	na	BVI214	BVI213
Date Sampled	na	na	na	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	na	9-Feb-16	9-Feb-16
Sample depth (m bgs)	na	na	na	1.22	3.35	0.46	3.2	3.2	na	0.3	3.2
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	na	<5	<5
Borehole No.	na	na	na	BH16-1	BH16-1	BH16-2	BH16-2	BH16-2	na	BH16-3	BH16-3
Calculated Parameters											
Sodium Adsorption Ratio	na	na	5	1.4	1.1	0.52	1	1	0%	0.49	3.6
Inorganics											
Conductivity	0.002	mS/cm	0.7	0.65	0.24	**1.5**	0.58	0.62	7%	0.29	**2.5**
Free Cyanide	0.01	µg/g	0.051	0.01	0.02	<0.01	0.02	0.02	0%	<0.01	0.02
Available (CaCl2) pH	na	pH	na	7.62	7.61	7.68	7.6	7.6	0%	7.84	7.55
Metals											
Soluble Calcium (Ca)	0.5	mg/L	na	57.6	12.2	256	33.9	35.5	5%	27.9	184
Soluble Magnesium (Mg)	0.5	mg/L	na	11.2	9.9	38.4	24.7	26.6	7%	7.6	75.5
Soluble Sodium (Na)	5	mg/L	na	46	20	34	32	33	3%	11	230
Inorganics											
Chromium (VI)	0.2	µg/g	10	<0.2	<0.2	<0.2	<0.2	<0.2	nc	<0.2	<0.2
Metals											
Boron (Hot Water Soluble)	0.050	µg/g	1.5	0.28	0.12	0.66	0.19	0.18	5%	0.35	0.2
Antimony	0.2	µg/g	7.5	<0.2	<0.2	<0.2	<0.2	<0.2	nc	<0.2	<0.2
Arsenic	1	µg/g	18	2	2	3	2	2	0%	3	2
Barium	0.5	µg/g	390	240	270	360	280	310	10%	120	250
Beryllium	0.2	µg/g	5	0.9	1	0.5	0.9	0.9	0%	0.4	0.7
Boron (Total)	5	µg/g	120	<5	11	10	8	7	13%	9	7
Cadmium	0.1	µg/g	1.2	<0.1	0.1	<0.1	<0.1	<0.1	nc	<0.1	0.1
Chromium	1	µg/g	160	89	130	13	140	130	7%	20	140
Cobalt	0.1	µg/g	22	21	**24**	4.5	**26**	**25**	4%	5.7	**23**
Copper	0.5	µg/g	180	21	50	11	49	47	4%	15	51
Lead	1	µg/g	120	10	10	9	9	8	12%	11	9
Mercury	0.05	µg/g	1.8	<0.05	<0.05	<0.05	<0.05	<0.05	nc	<0.05	<0.05
Molybdenum	0.5	µg/g	6.9	<0.5	<0.5	<0.5	0.5	0.6	18%	0.7	<0.5
Nickel	0.5	µg/g	130	35	73	9.2	75	70	7%	15	76
Selenium	0.5	µg/g	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	nc	<0.5	<0.5
Silver	0.2	µg/g	25	<0.2	<0.2	<0.2	<0.2	<0.2	nc	<0.2	<0.2
Thallium	0.05	µg/g	1	0.28	0.42	0.24	0.4	0.43	7%	0.15	0.35
Uranium	0.05	µg/g	23	1.1	1.1	0.48	0.84	0.86	2%	0.55	0.83
Vanadium	5	µg/g	86	72	**99**	10	**100**	**100**	0%	18	**100**
Zinc	5	µg/g	340	95	120	12	120	120	0%	42	110

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

µg/g	micrograms per gram
mg/L	milligrams per litre
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference; MOECC recommended RPDs are <20% for water and <30% for soil
-	Not Analysed
na	Not Applicable
nc	Not Calculated - one (1) or more concentrations less than 5 times RDL
< ####	Concentration less than laboratory RDL or adjusted RDL
VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
	Columns shaded grey (SP203 and duplicate) are sample locations which have since been removed from the site

Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH16-4-1	BH16-4-2	BH16-5-1	BH16-5-2	BH16-6-1	BH16-6-2	BH16-7-1	BH16-7-2	BH16-8-1	BH16-8-2	BH16-9-1	BH16-9-2	BH16-10-1	BH16-10-2
Laboratory Sample No.	na	na	na	BVI212	BVI211	BWG388	BWG389	BWJ272	BWJ273	BWJ270	BWJ271	BWJ304	BWJ305	BWJ268	BWJ269	BWG382	BWG383
Date Sampled	na	na	na	9-Feb-16	9-Feb-16	16-Feb-16	16-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	16-Feb-16	16-Feb-16
Sample depth (m bgs)	na	na	na	0.3	3.35	1.07	4.27	0.3	2.74	0.3	2.74	1.22	2.74	0.3	2.74	1.37	2.74
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Borehole No.	na	na	na	BH16-4	BH16-4	BH16-5	BH16-5	BH16-6	BH16-6	BH16-7	BH16-7	BH16-8	BH16-8	BH16-9	BH16-9	BH16-10	BH16-10
Calculated Parameters																	
Sodium Adsorption Ratio	na	na	5	4.5	3.5	0.79	1.5	2	0.85	0.62	0.82	1.4	1.6	0.55	0.67	0.94	1
Inorganics																	
Conductivity	0.002	mS/cm	0.7	**1.1**	**1.8**	0.32	0.24	0.25	**0.93**	0.28	0.41	0.29	**0.8**	**2.6**	**0.84**	0.27	0.22
Free Cyanide	0.01	µg/g	0.051	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Available (CaCl2) pH	na	pH	na	7.83	7.55	7.36	7.92	7.79	7.69	7.54	7.63	6.7	7.18	7.69	7.47	7.43	7.59
Metals																	
Soluble Calcium (Ca)	0.5	mg/L	na	66.6	97.7	25.8	13.1	11.3	72.1	24.8	24.1	21.1	45.5	575	67.5	16.8	13.6
Soluble Magnesium (Mg)	0.5	mg/L	na	9.7	58	14.2	8	3.1	48	7	20.3	6.4	31.4	44.6	43.7	12.6	9.8
Soluble Sodium (Na)	5	mg/L	na	149	176	20	27	29	38	14	22	29	56	51	29	21	20
Inorganics																	
Chromium (VI)	0.2	µg/g	10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Metals																	
Boron (Hot Water Soluble)	0.050	µg/g	1.5	0.49	0.19	0.068	0.21	0.42	0.17	0.27	0.18	0.26	0.11	0.67	0.14	0.089	0.12
Antimony	0.2	µg/g	7.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Arsenic	1	µg/g	18	3	2	3	2	3	1	3	1	2	1	4	1	1.4	1
Barium	0.5	µg/g	390	110	250	200	240	**460**	280	110	220	140	310	360	340	290	290
Beryllium	0.2	µg/g	5	0.3	0.9	0.5	0.9	0.6	0.9	0.2	0.7	0.8	0.9	0.6	0.9	0.81	0.9
Boron (Total)	5	µg/g	120	8	8	14	11	7	9	6	6	<5	<5	6	<5	5.0	6
Cadmium	0.1	µg/g	1.2	<0.1	0.1	<0.1	0.1	<0.1	0.1	0.2	0.1	0.3	0.1	<0.1	0.1	0.15	<0.1
Chromium	1	µg/g	160	10	140	21	150	11	120	7	130	74	110	10	140	130	150
Cobalt	0.1	µg/g	22	3.3	**23**	8.7	**27**	6.6	**23**	2.6	22	13	**23**	5.6	**24**	**23**	**27**
Copper	0.5	µg/g	180	4.6	54	18	56	5.9	56	16	51	21	44	5.4	50	56	53
Lead	1	µg/g	120	5	9	10	10	12	10	12	9	23	8	11	8	8.7	9
Mercury	0.05	µg/g	1.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Molybdenum	0.5	µg/g	6.9	<0.5	<0.5	1.3	0.7	<0.5	<0.5	0.7	0.5	0.7	<0.5	0.7	<0.5	0.53	0.7
Nickel	0.5	µg/g	130	5.7	77	19	83	14	69	5.7	73	36	64	12	72	72	83
Selenium	0.5	µg/g	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.50	<0.5
Silver	0.2	µg/g	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Thallium	0.05	µg/g	1	0.13	0.41	0.22	0.35	0.27	0.42	0.12	0.35	0.25	0.46	0.29	0.49	0.40	0.42
Uranium	0.05	µg/g	23	0.51	0.94	0.48	2.6	0.55	1.2	0.53	1.2	1.6	0.98	0.63	1.1	1.2	1.1
Vanadium	5	µg/g	86	9	**110**	22	**100**	9	**110**	7	**99**	64	**100**	8	**120**	**110**	**110**
Zinc	5	µg/g	340	18	120	36	120	16	120	39	100	96	120	14	130	120	120

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, G
Sediment Standards for Use Under Part XV.1 of the Environmental Protec
15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a
Water Condition for Fine Textured Soils and Residential/Parkland/Institutic

µg/g	micrograms per gram
mg/L	milligrams per litre
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference; MOECC recommended RPDs are <20% for w
-	Not Analysed
na	Not Applicable
nc	Not Calculated - one (1) or more concentrations less than 5 times RDL
< ####	Concentration less than laboratory RDL or adjusted RDL
VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
	Columns shaded grey (SP203 and duplicate) are sample locations which have since been removed from the site

Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH16-11-1	BH16-11-2	BH16-12-1	BH16-12-2	BH16-13-1	BH16-13-2	BH16-14-1	DUP-2	RPD	BH16-14-2	BH16-15-1	BH16-15-2	BH16-16-1	BH16-16-2
Laboratory Sample No.	na	na	na	BWG384	BWG385	BWJ266	BWJ267	BWG386	BWG387	BWJ264	BWJ306	na	BWJ265	BVI210	BVI209	BVI208	BVI207
Date Sampled	na	na	na	16-Feb-16	16-Feb-16	17-Feb-16	17-Feb-16	16-Feb-16	16-Feb-16	17-Feb-16	17-Feb-16	na	17-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16
Sample depth (m bgs)	na	na	na	0.76	2.9	1.22	2.74	1.07	3.05	1.07	1.07	na	3.35	1.07	2.44	1.07	2.44
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	<5	<5	<5	na	<5	<5	<5	<5	<5
Borehole No.	na	na	na	BH16-11	BH16-11	BH16-12	BH16-12	BH16-13	BH16-13	BH16-14	BH16-14	na	BH16-14	BH16-15	BH16-15	BH16-16	BH16-16
Calculated Parameters																	
Sodium Adsorption Ratio	na	na	5	0.58	1.3	1.1	1	1.1	1.1	0.87	1.1	23%	1	1.2	1.1	0.96	0.95
Inorganics																	
Conductivity	0.002	mS/cm	0.7	**1.9**	0.3	0.6	**0.78**	**0.81**	0.34	0.43	0.29	*39%*	0.26	0.26	0.25	0.13	0.19
Free Cyanide	0.01	µg/g	0.051	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	nc	<0.01	0.02	0.02	0.02	0.02
Available (CaCl2) pH	na	pH	na	7.73	7.82	7.41	7.4	7.75	7.44	7.19	7.03	2%	7.56	7.38	7.56	6.98	7.42
Metals																	
Soluble Calcium (Ca)	0.5	mg/L	na	387	14.5	38.1	52.9	81.2	17.7	30.4	15.8	*63%*	14.3	11.9	13.1	5.2	10
Soluble Magnesium (Mg)	0.5	mg/L	na	37.7	12.3	25.8	35.5	29.9	13.7	18.9	10.9	*54%*	9.5	8.7	9.6	4.9	8.3
Soluble Sodium (Na)	5	mg/L	na	45	28	37	39	44	24	25	23	8%	20	22	22	13	17
Inorganics																	
Chromium (VI)	0.2	µg/g	10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	nc	<0.2	<0.2	<0.2	<0.2	<0.2
Metals																	
Boron (Hot Water Soluble)	0.050	µg/g	1.5	0.35	0.17	0.088	0.12	0.37	0.096	0.067	0.052	nc	0.12	0.098	0.15	<0.050	0.15
Antimony	0.2	µg/g	7.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	nc	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	1	µg/g	18	3	1	2	1	2	2	1	2	nc	2	3	2	2	2
Barium	0.5	µg/g	390	**440**	360	260	330	280	240	370	360	3%	230	250	270	320	300
Beryllium	0.2	µg/g	5	0.5	0.9	0.9	0.9	1	1	0.9	1.3	*36%*	0.9	1	1	1	0.9
Boron (Total)	5	µg/g	120	10	6	7	6	7	8	<5	<5	nc	8	9	9	<5	7
Cadmium	0.1	µg/g	1.2	<0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	0.2	nc	0.1	0.1	<0.1	0.1	0.1
Chromium	1	µg/g	160	11	130	150	140	**170**	150	140	140	0%	160	140	150	130	140
Cobalt	0.1	µg/g	22	6	**24**	**24**	**26**	**25**	**27**	**27**	**31**	14%	**28**	**26**	**26**	**25**	**24**
Copper	0.5	µg/g	180	5.8	50	52	52	60	53	47	54	14%	55	54	49	45	52
Lead	1	µg/g	120	10	7	10	9	10	10	8	10	22%	11	11	10	8	10
Mercury	0.05	µg/g	1.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	nc	<0.05	<0.05	<0.05	<0.05	<0.05
Molybdenum	0.5	µg/g	6.9	<0.5	0.7	0.5	<0.5	0.6	0.5	<0.5	<0.5	nc	0.6	0.7	<0.5	0.6	0.5
Nickel	0.5	µg/g	130	13	68	80	75	88	82	78	80	3%	87	84	82	74	75
Selenium	0.5	µg/g	2.4	<0.5	0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	nc	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	0.2	µg/g	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	nc	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	0.05	µg/g	1	0.14	0.51	0.41	0.49	0.44	0.38	0.47	0.46	2%	0.39	0.37	0.45	0.44	0.46
Uranium	0.05	µg/g	23	0.51	1	1.5	1.1	1.3	1.1	1.1	1.7	*43%*	1.2	1.4	0.98	1.3	1.2
Vanadium	5	µg/g	86	8	**130**	**100**	**120**	**120**	**100**	**120**	**120**	0%	**100**	**110**	**100**	**110**	**110**
Zinc	5	µg/g	340	17	130	110	120	130	110	130	130	0%	120	120	120	120	130

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, G
Sediment Standards for Use Under Part XV.1 of the Environmental Protec
15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a
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µg/g	micrograms per gram
mg/L	milligrams per litre
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m bgs	metres below ground surface
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RDL	Laboratory reportable detection limit
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Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH16-17-1	BH16-17-2	SP101	SP102	SP103	SP104	SP105	SP106	DUP-4	RPD	SP107	SP108	SP109	SP110	SP111
Laboratory Sample No.	na	na	na	BVI206	BVI205	CIZ131	CIZ132	CIZ133	CIZ134	CIZ135	CIZ136	CIZ137	na	CIZ139	CIZ140	CIZ141	CIZ142	CIZ143
Date Sampled	na	na	na	9-Feb-16	9-Feb-16	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	na	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16
Sample depth (m bgs)	na	na	na	1.07	2.74	0.5	0.5	0.5	0.5	0.5	0.5	0.5	na	0.5	0.5	0.5	0.5	0.5
CGM Reading (ppmv)	na	na	na	<5	<5	na	na	na	na	na	na	na	na	na	na	na	na	na
Borehole No.	na	na	na	BH16-17	BH16-17	SP101	SP102	SP103	SP104	SP105	SP106	SP106	na	SP107	SP108	SP109	SP110	SP111
Calculated Parameters																		
Sodium Adsorption Ratio	na	na	5	0.46	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																		
Conductivity	0.002	mS/cm	0.7	0.14	0.31	-	-	-	-	-	-	-	-	-	-	-	-	-
Free Cyanide	0.01	µg/g	0.051	**0.1**	**0.28**	**0.07**	**0.07**	**0.07**	**0.06**	0.05	0.04	0.05	22%	**0.06**	**0.07**	0.04	**0.06**	0.04
Available (CaCl2) pH	na	pH	na	6.28	5.69	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																		
Soluble Calcium (Ca)	0.5	mg/L	na	12.9	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Magnesium (Mg)	0.5	mg/L	na	6.1	11.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sodium (Na)	5	mg/L	na	8	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																		
Chromium (VI)	0.2	µg/g	10	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																		
Boron (Hot Water Soluble)	0.050	µg/g	1.5	0.21	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	0.2	µg/g	7.5	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	1	µg/g	18	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	0.5	µg/g	390	150	150	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	0.2	µg/g	5	0.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (Total)	5	µg/g	120	5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	0.1	µg/g	1.2	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	1	µg/g	160	79	82	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	0.1	µg/g	22	18	18	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	0.5	µg/g	180	20	21	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	1	µg/g	120	16	17	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.05	µg/g	1.8	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.5	µg/g	6.9	0.8	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	0.5	µg/g	130	35	34	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	0.5	µg/g	2.4	0.6	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	0.2	µg/g	25	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	0.05	µg/g	1	0.27	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	0.05	µg/g	23	1.1	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	5	µg/g	86	82	75	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	5	µg/g	340	83	99	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, G
Sediment Standards for Use Under Part XV.1 of the Environmental Protec
15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a
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µg/g micrograms per gram
mg/L milligrams per litre
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommended RPDs are <20% for w
- Not Analysed
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
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VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS
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Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	SP112	DUP-5	RPD	SP113	SP114	SP115	SP203	DUP-6	RPD	TP16-1-1	TP16-2-1	DUP-3	RPD
Laboratory Sample No.	na	na	na	CIZ144	CIZ138	na	CIZ145	CIZ146	CIZ147	CIZ148	CIZ150	na	CIZ101	CIZ098	CIZ099	na
Date Sampled	na	na	na	12-May-16	12-May-16	na	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	na	12-May-16	12-May-16	12-May-16	na
Sample depth (m bgs)	na	na	na	0.5	0.5	na	0.5	0.5	0.5	0.5	0.5	na	0.75	1.0	1.0	na
CGM Reading (ppmv)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Borehole No.	na	na	na	SP112	SP112	na	SP113	SP114	SP115	SP203	SP203	na	TP16-1	TP16-2	TP16-2	na
Calculated Parameters																
Sodium Adsorption Ratio	na	na	5	-	-	-	-	-	-	0.31	0.35	12%	-	-	-	-
Inorganics																
Conductivity	0.002	mS/cm	0.7	-	-	-	-	-	-	0.12	0.1	18%	**0.75**	**0.83**	**0.82**	1%
Free Cyanide	0.01	µg/g	0.051	**0.06**	0.05	18%	**0.07**	**0.07**	**0.06**	<0.01	<0.01	nc	-	-	-	-
Available (CaCl2) pH	na	pH	na	-	-	-	-	-	-	7.92	8.03	1%	-	-	-	-
Metals																
Soluble Calcium (Ca)	0.5	mg/L	na	-	-	-	-	-	-	15.9	13.3	18%	-	-	-	-
Soluble Magnesium (Mg)	0.5	mg/L	na	-	-	-	-	-	-	2.2	1.5	nc	-	-	-	-
Soluble Sodium (Na)	5	mg/L	na	-	-	-	-	-	-	<5	<5	nc	-	-	-	-
Inorganics																
Chromium (VI)	0.2	µg/g	10	-	-	-	-	-	-	0.5	1.4	nc	-	-	-	-
Metals																
Boron (Hot Water Soluble)	0.050	µg/g	1.5	-	-	-	-	-	-	0.16	0.14	13%	-	-	-	-
Antimony	0.2	µg/g	7.5	-	-	-	-	-	-	<0.20	<0.20	nc	-	-	-	-
Arsenic	1	µg/g	18	-	-	-	-	-	-	2.3	2.4	4%	-	-	-	-
Barium	0.5	µg/g	390	-	-	-	-	-	-	72	57	23%	-	-	-	-
Beryllium	0.2	µg/g	5	-	-	-	-	-	-	0.41	<0.20	nc	-	-	-	-
Boron (Total)	5	µg/g	120	-	-	-	-	-	-	6.1	<5.0	nc	-	-	-	-
Cadmium	0.1	µg/g	1.2	-	-	-	-	-	-	0.11	<0.10	nc	-	-	-	-
Chromium	1	µg/g	160	-	-	-	-	-	-	19	11	*53%*	71	10	9.4	6%
Cobalt	0.1	µg/g	22	-	-	-	-	-	-	8.1	3.8	*72%*	-	-	-	-
Copper	0.5	µg/g	180	-	-	-	-	-	-	16	8.1	*66%*	-	-	-	-
Lead	1	µg/g	120	-	-	-	-	-	-	8.2	21	*88%*	-	-	-	-
Mercury	0.05	µg/g	1.8	-	-	-	-	-	-	<0.050	<0.050	nc	-	-	-	-
Molybdenum	0.5	µg/g	6.9	-	-	-	-	-	-	<0.50	1	nc	-	-	-	-
Nickel	0.5	µg/g	130	-	-	-	-	-	-	17	8.3	*69%*	-	-	-	-
Selenium	0.5	µg/g	2.4	-	-	-	-	-	-	<0.50	<0.50	nc	-	-	-	-
Silver	0.2	µg/g	25	-	-	-	-	-	-	<0.20	<0.20	nc	-	-	-	-
Thallium	0.05	µg/g	1	-	-	-	-	-	-	0.14	0.11	24%	-	-	-	-
Uranium	0.05	µg/g	23	-	-	-	-	-	-	0.46	0.35	27%	-	-	-	-
Vanadium	5	µg/g	86	-	-	-	-	-	-	26	20	26%	-	-	-	-
Zinc	5	µg/g	340	-	-	-	-	-	-	39	38	3%	-	-	-	-

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, G
Sediment Standards for Use Under Part XV.1 of the Environmental Protec
15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a
Water Condition for Fine Textured Soils and Residential/Parkland/Institutic

µg/g micrograms per gram
mg/L milligrams per litre
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommended RPDs are <20% for w
- Not Analysed
na Not Applicable
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VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS
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Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	TP16-3-1	DUP-1	RPD	TP16-4-1	DUP-2	RPD	TP16-5-1	TP16-6-1	TP16-6-2	TP16-7-1	TP16-8-1	TP16-9-1	TP16-10-1	TP16-11-1
Laboratory Sample No.	na	na	na	CIZ103	CIZ104	na	CIZ106	CIZ107	na	CIZ109	CIZ114	CIZ115	CIZ112	CIZ120	CIZ121	CIZ122	CIZ123
Date Sampled	na	na	na	12-May-16	12-May-16	na	12-May-16	12-May-16	na	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16
Sample depth (m bgs)	na	na	na	0.75	0.75	na	0.45	0.45	na	0.75	0.5	1.3	0.7	0.7	0.6	0.7	0.8
CGM Reading (ppmv)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Borehole No.	na	na	na	TP16-3	TP16-3	na	TP16-4	TP16-4	na	TP16-5	TP16-6	TP16-6	TP16-7-1	TP16-8	TP16-9	TP16-10	TP16-11
Calculated Parameters																	
Sodium Adsorption Ratio	na	na	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																	
Conductivity	0.002	mS/cm	0.7	0.33	0.35	6%	**0.97**	**0.88**	10%	**2.5**	**2.3**	**1.9**	**1.6**	0.38	**1.2**	**0.91**	**2.4**
Free Cyanide	0.01	µg/g	0.051	-	-	-	<0.01	<0.01	nc	-	-	<0.01	-	-	-	-	-
Available (CaCl2) pH	na	pH	na	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Soluble Calcium (Ca)	0.5	mg/L	na	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Magnesium (Mg)	0.5	mg/L	na	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soluble Sodium (Na)	5	mg/L	na	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																	
Chromium (VI)	0.2	µg/g	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Boron (Hot Water Soluble)	0.050	µg/g	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	0.2	µg/g	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	1	µg/g	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	0.5	µg/g	390	-	-	-	**450**	**490**	9%	**440**	320	370	240	-	-	-	**460**
Beryllium	0.2	µg/g	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (Total)	5	µg/g	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	0.1	µg/g	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	1	µg/g	160	67	120	57%	12	10	18%	-	-	120	-	-	-	-	-
Cobalt	0.1	µg/g	22	-	-	-	4.3	4.5	5%	-	-	**32**	-	-	-	-	-
Copper	0.5	µg/g	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	1	µg/g	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.05	µg/g	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.5	µg/g	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	0.5	µg/g	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	0.5	µg/g	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	0.2	µg/g	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	0.05	µg/g	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	0.05	µg/g	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	5	µg/g	86	-	-	-	8	7.6	5%	-	-	**99**	-	-	-	-	-
Zinc	5	µg/g	340	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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µg/g	micrograms per gram
mg/L	milligrams per litre
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference; MOECC recommended RPDs are <20% for w
-	Not Analysed
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VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
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Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	TP16-12-1	TP16-12-2	TP16-13-1	TP16-14-1	TP16-15-1	BH17-3-2	DUP-1	RPD	BH17-4-2	BH17-5-1	DUP-2	RPD	BH17-6-1	BH17-7-1
Laboratory Sample No.	na	na	na	CIZ126	CIZ127	CIZ119	CIZ129	CIZ130	EIW952	EIW953	na	EIW969	EIW954	EIW955	na	EIW956	EIW959
Date Sampled	na	na	na	12-May-16	12-May-16	12-May-16	12-May-16	12-May-16	9-May-17	9-May-17	na	9-May-17	9-May-17	9-May-17	na	9-May-17	9-May-17
Sample depth (m bgs)	na	na	na	0.8	0.9	0.85	1.2	1.2	0.76 - 1.5	0.76 - 1.5	na	0.76 - 1.5	0 - 0.76	0 - 0.76	na	0 - 0.76	0 - 0.76
CGM Reading (ppmv)	na	na	na	na	na	na	na	na	10	10	na	10	<5	<5	na	5	<5
Borehole No.	na	na	na	TP16-12	TP16-12	TP16-13	TP16-14	TP16-15	BH17-3	BH17-3	na	BH17-4	BH17-5	BH17-5	na	BH17-6	BH17-7
Calculated Parameters																	
Sodium Adsorption Ratio	na	na	5	-	-	-	-	-	0.44	1.1	*86%*	-	-	-	na	-	-
Inorganics																	
Conductivity	0.002	mS/cm	0.7	0.27	0.37	**0.77**	-	-	0.239	0.220	8%	0.364	0.170	-	na	-	**1.14**
Free Cyanide	0.01	µg/g	0.051	-	0.01	-	0.05	<0.01	<0.01	<0.01	nc	-	<0.01	<0.01	nc	<0.01	-
Available (CaCl2) pH	na	pH	na	-	-	-	-	-	7.06	7.43	5%	-	-	-	na	-	-
Metals																	
Soluble Calcium (Ca)	0.5	mg/L	na	-	-	-	-	-	-	-	na	-	-	-	na	-	-
Soluble Magnesium (Mg)	0.5	mg/L	na	-	-	-	-	-	-	-	na	-	-	-	na	-	-
Soluble Sodium (Na)	5	mg/L	na	-	-	-	-	-	-	-	na	-	-	-	na	-	-
Inorganics																	
Chromium (VI)	0.2	µg/g	10	-	-	-	-	-	0.5	0.4	22%	-	-	-	na	-	-
Metals																	
Boron (Hot Water Soluble)	0.050	µg/g	1.5	-	-	-	-	-	0.15	0.11	nc	-	-	-	na	-	-
Antimony	0.2	µg/g	7.5	-	-	-	-	-	<0.20	<0.20	nc	-	-	-	na	-	-
Arsenic	1	µg/g	18	-	-	-	-	-	2.4	1.9	23%	-	-	-	na	-	-
Barium	0.5	µg/g	390	190	230	-	-	-	210	190	10%	-	-	-	na	-	-
Beryllium	0.2	µg/g	5	-	-	-	-	-	1.3	0.9	nc	-	-	-	na	-	-
Boron (Total)	5	µg/g	120	-	-	-	-	-	11	8	nc	-	-	-	na	-	-
Cadmium	0.1	µg/g	1.2	-	-	-	-	-	0.13	0.11	17%	-	-	-	na	-	-
Chromium	1	µg/g	160	-	84	-	-	-	110	100	10%	-	-	-	na	-	-
Cobalt	0.1	µg/g	22	-	**24**	-	-	-	**24**	21	13%	-	-	-	na	-	-
Copper	0.5	µg/g	180	-	-	-	-	-	50	43	15%	-	-	-	na	-	-
Lead	1	µg/g	120	-	-	-	-	-	13	9	*36%*	-	-	-	na	-	-
Mercury	0.05	µg/g	1.8	-	-	-	-	-	<0.050	<0.050	nc	-	-	-	na	-	-
Molybdenum	0.5	µg/g	6.9	-	-	-	-	-	<0.50	0.56	nc	-	-	-	na	-	-
Nickel	0.5	µg/g	130	-	-	-	-	-	68	59	14%	-	-	-	na	-	-
Selenium	0.5	µg/g	2.4	-	-	-	-	-	<0.50	<0.50	nc	-	-	-	na	-	-
Silver	0.2	µg/g	25	-	-	-	-	-	<0.20	<0.20	nc	-	-	-	na	-	-
Thallium	0.05	µg/g	1	-	-	-	-	-	0.32	0.29	10%	-	-	-	na	-	-
Uranium	0.05	µg/g	23	-	-	-	-	-	1.2	0.86	*33%*	-	-	-	na	-	-
Vanadium	5	µg/g	86	-	79	-	-	-	**87**	82	6%	-	-	-	na	-	-
Zinc	5	µg/g	340	-	-	-	-	-	100	93	7%	-	-	-	na	-	-

Notes:

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Sediment Standards for Use Under Part XV.1 of the Environmental Protec
15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a
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µg/g	micrograms per gram
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CGM	combustible gas meter
m bgs	metres below ground surface
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Table 9.2
SOIL ANALYTICAL RESULTS - METALS and INORGANICS
FirstGroup America
1830 Trim Road
Orleans, Ontario

ARCADIS Design & Consultancy for natural and built assets

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH18-1	DUP-1	RPD	BH18-2	BH18-3	BH18-4	BH18-1	BH18-2	BH18-3	BH18-4	SP301	DUP-2	RPD
Laboratory Sample No.	na	na	na	GGD032	GGD064	na	GGD033	GGD034	GGD035	GPW734	GPW735	GPW736	GPW737	GGD039	GGD065	na
Date Sampled	na	na	na	13-Mar-18	13-Mar-18	na	13-Mar-18	13-Mar-18	13-Mar-18	13-Mar-18	13-Mar-18	13-Mar-18	13-Mar-18	13-Mar-18	13-Mar-18	na
Sample depth (m bgs)	na	na	na	3.5	3.5	na	3.5	4.0	3.5	4.8	4.5	4.5	4.5	3.8	3.8	na
CGM Reading (ppmv)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Borehole No.	na	na	na	BH18-1	BH18-1	na	BH18-2	BH18-3	BH18-4	BH18-1-2	BH18-2-2	BH18-3-2	BH18-4-2	SP301	SP301	na
Calculated Parameters																
Sodium Adsorption Ratio	na	na	5	-	-	na	-	-	-	-	-	-	-	-	-	na
Inorganics																
Conductivity	0.002	mS/cm	0.7	0.25	0.29	nc	0.33	0.63	0.51	-	-	-	-	-	-	na
Free Cyanide	0.01	µg/g	0.051	-	-	na	-	-	-	-	-	-	-	<0.01	<0.01	na
Available (CaCl2) pH	na	pH	na	-	-	na	-	-	-	-	-	-	-	-	-	na
Metals																
Soluble Calcium (Ca)	0.5	mg/L	na	-	-	na	-	-	-	-	-	-	-	-	-	na
Soluble Magnesium (Mg)	0.5	mg/L	na	-	-	na	-	-	-	-	-	-	-	-	-	na
Soluble Sodium (Na)	5	mg/L	na	-	-	na	-	-	-	-	-	-	-	-	-	na
Inorganics																
Chromium (VI)	0.2	µg/g	10	-	-	na	-	-	-	-	-	-	-	-	-	na
Metals																
Boron (Hot Water Soluble)	0.050	µg/g	1.5	-	-	na	-	-	-	-	-	-	-	-	-	na
Antimony	0.2	µg/g	7.5	-	-	na	-	-	-	-	-	-	-	-	-	na
Arsenic	1	µg/g	18	-	-	na	-	-	-	-	-	-	-	-	-	na
Barium	0.5	µg/g	390	-	-	na	-	-	-	-	-	-	-	-	-	na
Beryllium	0.2	µg/g	5	-	-	na	-	-	-	-	-	-	-	-	-	na
Boron (Total)	5	µg/g	120	-	-	na	-	-	-	-	-	-	-	-	-	na
Cadmium	0.1	µg/g	1.2	-	-	na	-	-	-	-	-	-	-	-	-	na
Chromium	1	µg/g	160	-	-	na	-	-	-	-	-	-	-	-	-	na
Cobalt	0.1	µg/g	22	-	-	na	-	-	-	-	-	-	-	-	-	na
Copper	0.5	µg/g	180	-	-	na	-	-	-	-	-	-	-	-	-	na
Lead	1	µg/g	120	-	-	na	-	-	-	-	-	-	-	-	-	na
Mercury	0.05	µg/g	1.8	-	-	na	-	-	-	-	-	-	-	-	-	na
Molybdenum	0.5	µg/g	6.9	-	-	na	-	-	-	-	-	-	-	-	-	na
Nickel	0.5	µg/g	130	-	-	na	-	-	-	-	-	-	-	-	-	na
Selenium	0.5	µg/g	2.4	-	-	na	-	-	-	-	-	-	-	-	-	na
Silver	0.2	µg/g	25	-	-	na	-	-	-	-	-	-	-	-	-	na
Thallium	0.05	µg/g	1	-	-	na	-	-	-	-	-	-	-	-	-	na
Uranium	0.05	µg/g	23	-	-	na	-	-	-	-	-	-	-	-	-	na
Vanadium	5	µg/g	86	-	-	na	-	-	-	**100**	**110**	**110**	**100**	-	-	na
Zinc	5	µg/g	340	-	-	na	-	-	-	-	-	-	-	-	-	na

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FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	SP302	SP303	BH18-8-1	BH18-9-1	BH18-10-1	DUP-1	RPD
Laboratory Sample No.	na	na	na	GGD040	GGD041	HIO523	HIO525	HIO527	HIO528	na
Date Sampled	na	na	na	13-Mar-18	13-Mar-18	27-Jul-18	27-Jul-18	27-Jul-18	27-Jul-18	na
Sample depth (m bgs)	na	na	na	4.0	4.0	10.25	10.25	10.25	10.25	na
CGM Reading (ppmv)	na	na	na	na	na	<5	<5	<5	<5	na
Borehole No.	na	na	na	SP302	SP303	BH18-8-1	BH18-9	BH18-10	SP301	na
Calculated Parameters										
Sodium Adsorption Ratio	na	na	5	-	-	3.9	**6.5**	**5.8**	**5.8**	0%
Inorganics										
Conductivity	0.002	mS/cm	0.7	-	-	0.39	0.36	0.330	0.34	3%
Free Cyanide	0.01	µg/g	0.051	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	nc
Available (CaCl2) pH	na	pH	na	-	-	8.44	8.46	8.48	8.51	0%
Metals										
Soluble Calcium (Ca)	0.5	mg/L	na	-	-	-	-	-	-	na
Soluble Magnesium (Mg)	0.5	mg/L	na	-	-	-	-	-	-	na
Soluble Sodium (Na)	5	mg/L	na	-	-	-	-	-	-	na
Inorganics										
Chromium (VI)	0.2	µg/g	10	-	-	<0.2	<0.2	<0.2	<0.2	nc
Metals										
Boron (Hot Water Soluble)	0.050	µg/g	1.5	-	-	1.2	0.98	1.1	1.2	9%
Antimony	0.2	µg/g	7.5	-	-	<0.20	<0.20	<0.20	<0.20	nc
Arsenic	1	µg/g	18	-	-	1.6	1.2	1.2	1.4	nc
Barium	0.5	µg/g	390	-	-	290	300	290	280	4%
Beryllium	0.2	µg/g	5	-	-	0.89	0.8	0.79	0.82	nc
Boron (Total)	5	µg/g	120	-	-	11	8.6	9.1	9	nc
Cadmium	0.1	µg/g	1.2	-	-	0.14	0.16	0.12	0.13	nc
Chromium	1	µg/g	160	-	-	120	120	140	140	0%
Cobalt	0.1	µg/g	22	-	-	**25**	**24**	**26**	**25**	4%
Copper	0.5	µg/g	180	-	-	51	51	55	55	0%
Lead	1	µg/g	120	-	-	8.9	7.9	8.5	8.8	3%
Mercury	0.05	µg/g	1.8	-	-	<0.050	<0.050	<0.050	<0.050	nc
Molybdenum	0.5	µg/g	6.9	-	-	1	0.93	0.86	0.92	nc
Nickel	0.5	µg/g	130	-	-	70	69	78	76	3%
Selenium	0.5	µg/g	2.4	-	-	<0.50	<0.50	<0.50	<0.50	nc
Silver	0.2	µg/g	25	-	-	<0.20	<0.20	<0.20	<0.20	nc
Thallium	0.05	µg/g	1	-	-	0.42	0.42	0.44	0.42	5%
Uranium	0.05	µg/g	23	-	-	2	1.8	1.3	1.4	7%
Vanadium	5	µg/g	86	-	-	**100**	**110**	**110**	**110**	0%
Zinc	5	µg/g	340	-	-	130	130	130	130	0%

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, G
Sediment Standards for Use Under Part XV.1 of the Environmental Protec
15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a
Water Condition for Fine Textured Soils and Residential/Parkland/Institutic

µg/g	micrograms per gram
mg/L	milligrams per litre
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference; MOECC recommended RPDs are <20% for w
-	Not Analysed
na	Not Applicable
nc	Not Calculated - one (1) or more concentrations less than 5 times RDL
< ####	Concentration less than laboratory RDL or adjusted RDL
VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
	Columns shaded grey (SP203 and duplicate) are sample locations which have since been removed from the site

Table 9.3
SOIL ANALYTICAL RESULTS - PESTICIDES and HERBICIDES/ PCBs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH16-7-1	BH16-8-1	BH16-12-1	BH16-13-1	BH16-15-1	BH16-17-1	SP203	DUP-6	RPD	BH18-5	DUP-3	RPD	BH18-6	BH18-7
Laboratory Sample No.	na	na	na	BWJ270	BWJ304	BWJ266	BWG386	BVI210	BVI206	CIZ148	CIZ150	na	GGD036	GGD036	na	GGD036	GGD036
Date Sampled	na	na	na	17-Feb-16	17-Feb-16	17-Feb-16	16-Feb-16	9-Feb-16	9-Feb-16	12-May-16	12-May-16	na	13-Mar-18	13-Mar-18	na	13-Mar-18	13-Mar-18
Sample depth (m bgs)	na	na	na	0.3	1.22	1.22	1.07	1.07	1.07	0.5	0.5	na	0.5	0.5	na	0.5	0.65
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	<5	na	na	na	na	na	na	na	na
Borehole No.	na	na	na	BH16-7	BH16-8	BH16-12	BH16-13	BH16-15	BH16-17	SP203	SP203	na	BH18-5	BH18-5	na	BH18-6	BH18-7
Calculated Parameters																	
Chlordane (Total)	0.0020	µg/g	0.05	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
o,p-DDD + p,p-DDD	0.0020	µg/g	3.3	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
o,p-DDE + p,p-DDE	0.0020	µg/g	0.33	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
o,p-DDT + p,p-DDT	0.0020	µg/g	1.4	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Total Endosulfan	0.0020	µg/g	0.04	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Total PCB	0.015	µg/g	0.35	<0.015	<0.030	<0.015	<0.023	<0.015	<0.015	<0.15	<0.15	nc	<0.010	<0.010	nc	<0.010	<0.020
Pesticides & Herbicides		µg/g															
Aldrin	0.0030	µg/g	0.05	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
a-Chlordane	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
g-Chlordane	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
o,p-DDD	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
p,p-DDD	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
o,p-DDE	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
p,p-DDE	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
o,p-DDT	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
p,p-DDT	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Dieldrin	0.0030	µg/g	0.05	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Lindane	0.0030	µg/g	0.063	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Endosulfan I (alpha)	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Endosulfan II (beta)	0.0030	µg/g	na	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Endrin	0.0030	µg/g	0.04	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Heptachlor	0.0030	µg/g	0.15	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Heptachlor epoxide	0.0030	µg/g	0.05	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Hexachlorobenzene	0.0030	µg/g	0.52	<0.0020	<0.0040	<0.0020	<0.0030	<0.0020	<0.0020	<0.020	<0.020	nc	-	-	nc	-	-
Hexachlorobutadiene	0.0075	µg/g	0.014	<0.0050	<0.010	<0.0050	<0.0075	<0.0050	<0.0050	<0.010	<0.010	nc	-	-	nc	-	-
Hexachloroethane	0.0075	µg/g	0.071	<0.0050	<0.010	<0.0050	<0.0075	<0.0050	<0.0050	<0.010	<0.010	nc	-	-	nc	-	-
Methoxychlor	0.0075	µg/g	0.13	<0.0050	<0.010	<0.0050	<0.0075	<0.0050	<0.0050	<0.050	<0.050	nc	-	-	nc	-	-
Aroclor 1242	0.023	µg/g	na	<0.015	<0.030	<0.015	<0.023	<0.015	<0.015	<0.15	<0.15	nc	<0.010	<0.010	nc	<0.010	<0.020
Aroclor 1248	0.023	µg/g	na	<0.015	<0.030	<0.015	<0.023	<0.015	<0.015	<0.15	<0.15	nc	<0.010	<0.010	nc	<0.010	<0.020
Aroclor 1254	0.023	µg/g	na	<0.015	<0.030	<0.015	<0.023	<0.015	<0.015	<0.15	<0.15	nc	<0.010	<0.010	nc	<0.010	<0.020
Aroclor 1260	0.023	µg/g	na	<0.015	<0.030	<0.015	<0.023	<0.015	<0.015	<0.15	<0.15	nc	<0.010	<0.010	nc	<0.010	<0.020

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use Residential/Parkland/Institutional Property Use

µg/g micrograms per gram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
na Not Applicable
< #### Concentration less than laboratory RDL or adjusted RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS
Columns shaded grey (SP203 and duplicate) have been removed from the site

Table 9.4
SOIL ANALYTICAL RESULTS - PAHs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH16-1-1	BH16-1-2	BH16-2-1	BH16-2-2	DUP-1	RPD	BH16-3-1	BH16-3-2
Laboratory Sample No.	na	na	na	BVI227	BVI226	BVI225	BVI224	BVI228	na	BVI214	BVI213
Date Sampled	na	na	na	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	9-Feb-16	na	9-Feb-16	9-Feb-16
Sample depth (m bgs)	na	na	na	1.22	3.35	0.46	3.2	3.2	na	0.3	3.2
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	na	<5	<5
Borehole No.	na	na	na	BH16-1	BH16-1	BH16-2	BH16-2	BH16-2	na	BH16-3	BH16-3
Inorganics											
Moisture	0.2	%	na	24	32	5.9	40	38	5%	5	34
Calculated Parameters											
Methylnaphthalene, 2-(1-)	0.014	µg/g	3.4	<0.014	<0.014	<0.014	<0.014	<0.014	nc	<0.014	<0.014
Polyaromatic Hydrocarbons											
Acenaphthene	0.0050	µg/g	29	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Acenaphthylene	0.0050	µg/g	0.17	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Anthracene	0.0050	µg/g	0.74	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Benzo(a)anthracene	0.0050	µg/g	0.63	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Benzo(a)pyrene	0.0050	µg/g	0.3	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Benzo(b/j)fluoranthene	0.0050	µg/g	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Benzo(g,h,i)perylene	0.0050	µg/g	7.8	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Benzo(k)fluoranthene	0.0050	µg/g	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Chrysene	0.0050	µg/g	7.8	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Dibenz(a,h)anthracene	0.0050	µg/g	0.1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Fluoranthene	0.0050	µg/g	0.69	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Fluorene	0.0050	µg/g	69	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	0.0050	µg/g	0.48	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
1-Methylnaphthalene	0.0050	µg/g	na	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
2-Methylnaphthalene	0.0050	µg/g	na	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Naphthalene	0.0050	µg/g	0.75	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Phenanthrene	0.0050	µg/g	7.8	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050
Pyrene	0.0050	µg/g	78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.0050	<0.0050

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

µg/g	micrograms per gram
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference
na	Not Applicable
nc	Not Calculated - one (1) or more concentrations less than 5 times RDL
< ####	Concentration less than laboratory RDL
VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
	Columns shaded grey (SP203 and duplicate) have been removed from the site

Table 9.4
SOIL ANALYTICAL RESULTS - PAHs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH16-4-1	BH16-4-2	BH16-5-1	BH16-5-2	BH16-6-1	BH16-7-1	BH16-8-1	BH16-9-1	BH16-10-1	BH16-12-1	BH16-13-1
Laboratory Sample No.	na	na	na	BVI212	BVI211	BWG388	BWG389	BWJ272	BWJ270	BWJ304	BWJ268	BWG382	BWJ266	BWG386
Date Sampled	na	na	na	9-Feb-16	9-Feb-16	16-Feb-16	16-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	17-Feb-16	16-Feb-16	17-Feb-16	16-Feb-16
Sample depth (m bgs)	na	na	na	0.3	3.35	1.07	4.27	0.3	0.3	1.22	0.3	1.37	2.74	1.07
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Borehole No.	na	na	na	BH16-4	BH16-4	BH16-5	BH16-5	BH16-6	BH16-7	BH16-8	BH16-9	BH16-10	BH16-12	BH16-13
Inorganics														
Moisture	0.2	%	na	4	33	6	39	6.7	4.7	38	9	31	28	32
Calculated Parameters														
Methylnaphthalene, 2-(1-)	0.014	µg/g	3.4	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Polyaromatic Hydrocarbons														
Acenaphthene	0.0050	µg/g	29	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	0.0050	µg/g	0.17	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	0.0050	µg/g	0.74	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(a)anthracene	0.0050	µg/g	0.63	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.053	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(a)pyrene	0.0050	µg/g	0.3	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.057	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(b/j)fluoranthene	0.0050	µg/g	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.085	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(g,h,i)perylene	0.0050	µg/g	7.8	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.035	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(k)fluoranthene	0.0050	µg/g	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.024	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	0.0050	µg/g	7.8	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.057	<0.0050	<0.0050	<0.0050	<0.0050
Dibenz(a,h)anthracene	0.0050	µg/g	0.1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0086	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	0.0050	µg/g	0.69	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.11	<0.0050	<0.0050	<0.0050	<0.0050
Fluorene	0.0050	µg/g	69	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	0.0050	µg/g	0.48	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.035	<0.0050	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	0.0050	µg/g	na	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	0.0050	µg/g	na	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	0.0050	µg/g	0.75	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	0.0050	µg/g	7.8	<0.0050	<0.0050	0.013	<0.0050	<0.0050	<0.0050	0.021	<0.0050	<0.0050	<0.0050	<0.0050
Pyrene	0.0050	µg/g	78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.089	<0.0050	<0.0050	<0.0050	<0.0050

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

µg/g	micrograms per gram
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference
na	Not Applicable
nc	Not Calculated - one (1) or more concentrations less than 5 times RDL
< ####	Concentration less than laboratory RDL
VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
	Columns shaded grey (SP203 and duplicate) have been removed from the site

Table 9.4
SOIL ANALYTICAL RESULTS - PAHs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	BH16-14-1	DUP-2	RPD	BH16-15-1	BH16-17-1	SP203	DUP-6	RPD
Laboratory Sample No.	na	na	na	BWJ264	BWJ306	na	BVI210	BVI206	CIZ148	CIZ150	na
Date Sampled	na	na	na	17-Feb-16	17-Feb-16	na	9-Feb-16	9-Feb-16	12-May-16	12-May-16	na
Sample depth (m bgs)	na	na	na	1.07	1.07	na	1.07	1.07	0.5	0.5	na
CGM Reading (ppmv)	na	na	na	<5	<5	na	<5	<5	na	na	na
Borehole No.	na	na	na	BH16-14	BH16-14	na	BH16-15	BH16-17	SP203	SP203	na
Inorganics											
Moisture	0.2	%	na	25	28	11%	29	21	6.3	7.6	11%
Calculated Parameters											
Methylnaphthalene, 2-(1-)	0.014	µg/g	3.4	<0.014	<0.014	nc	<0.014	<0.014	<0.14	<0.14	nc
Polyaromatic Hydrocarbons											
Acenaphthene	0.0050	µg/g	29	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Acenaphthylene	0.0050	µg/g	0.17	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Anthracene	0.0050	µg/g	0.74	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Benzo(a)anthracene	0.0050	µg/g	0.63	<0.0050	<0.0050	nc	<0.0050	0.023	<0.10	<0.10	nc
Benzo(a)pyrene	0.0050	µg/g	0.3	<0.0050	<0.0050	nc	<0.0050	0.024	<0.10	<0.10	nc
Benzo(b/j)fluoranthene	0.0050	µg/g	0.78	<0.0050	<0.0050	nc	<0.0050	0.032	<0.10	<0.10	nc
Benzo(g,h,i)perylene	0.0050	µg/g	7.8	<0.0050	<0.0050	nc	<0.0050	0.016	<0.10	<0.10	nc
Benzo(k)fluoranthene	0.0050	µg/g	0.78	<0.0050	<0.0050	nc	<0.0050	0.011	<0.10	<0.10	nc
Chrysene	0.0050	µg/g	7.8	<0.0050	<0.0050	nc	<0.0050	0.023	<0.10	<0.10	nc
Dibenz(a,h)anthracene	0.0050	µg/g	0.1	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Fluoranthene	0.0050	µg/g	0.69	<0.0050	<0.0050	nc	<0.0050	0.056	<0.10	<0.10	nc
Fluorene	0.0050	µg/g	69	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Indeno(1,2,3-cd)pyrene	0.0050	µg/g	0.48	<0.0050	<0.0050	nc	<0.0050	0.015	<0.10	<0.10	nc
1-Methylnaphthalene	0.0050	µg/g	na	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
2-Methylnaphthalene	0.0050	µg/g	na	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Naphthalene	0.0050	µg/g	0.75	<0.0050	<0.0050	nc	<0.0050	<0.0050	<0.10	<0.10	nc
Phenanthrene	0.0050	µg/g	7.8	<0.0050	<0.0050	nc	<0.0050	0.022	<0.10	<0.10	nc
Pyrene	0.0050	µg/g	78	<0.0050	<0.0050	nc	<0.0050	0.048	<0.10	<0.10	nc

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

µg/g	micrograms per gram
CGM	combustible gas meter
m bgs	metres below ground surface
ppmv	parts per million by volume equivalent hexane
RDL	Laboratory reportable detection limit
RPD	Relative percent difference
na	Not Applicable
nc	Not Calculated - one (1) or more concentrations less than 5 times RDL
< ####	Concentration less than laboratory RDL
VALUE	**BOLD and UNDERLINED** Value Exceeds MOECC SCS
	Columns shaded grey (SP203 and duplicate) have been removed from the site

Table 9.5
SOIL ANALYTICAL RESULTS - FOC
FirstGroup America
1830 Trim Road
Orleans, Ontairo

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH16-5-1	BH16-6-1	BH16-7-1
Laboratory Sample No.	na	na	na	BWG388	BWJ272	BWJ270
Date Sampled	na	na	na	16-Feb-16	17-Feb-16	17-Feb-16
Sample depth (m bgs)	na	na	na	1.07	0.3	0.3
CGM Reading (ppmv)	na	na	na	<5	<5	<5
Borehole No.	na	na	na	BH16-5	BH16-6	BH16-7
Calculated Parameters						
Fraction of Organic Carbon	0.0005	g/g	na	0.011	0.0082	0.0062
Fraction of Organic Carbon (rep.#1)	0.0005	g/g	na	0.01	0.0099	0.0075
Fraction of Organic Carbon (rep.#2)	0.0005	g/g	na	0.012	0.011	0.0082
Average FOC Result	0.0005	g/g	na	0.011	0.0098	0.0073
Inorganics						
Total Organic Carbon	500	mg/kg	na	11000	8200	6200
Total Organic Carbon (repeat #1)	500	mg/kg	na	10000	9900	7500
Total Organic Carbon (repeat #2)	500	mg/kg	na	12000	11000	8200

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

g/g grams per gram
mg/kg milligrams per kilogram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
na Not Applicable
< #### Concentration less than laboratory RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.5
SOIL ANALYTICAL RESULTS - FOC
FirstGroup America
1830 Trim Road
Orleans, Ontairo

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	BH16-9-1	BH16-11-1	BH16-12-1	BH16-13-1	BH16-14-1	TP16-4-1	DUP-2	RPD	TP16-6-2	TP16-12-2
Laboratory Sample No.	na	na	na	BWJ268	BWG384	BWJ266	BWG386	BWJ264	CIZ106	CIZ107	na	CIZ115	CIZ127
Date Sampled	na	na	na	17-Feb-16	16-Feb-16	17-Feb-16	16-Feb-16	17-Feb-16	12-May-16	12-May-16	na	12-May-16	12-May-16
Sample depth (m bgs)	na	na	na	0.3	0.76	1.22	1.07	1.07	0.45	0.45	na	1.3	0.9
CGM Reading (ppmv)	na	na	na	<5	<5	<5	<5	<5	na	na	na	na	na
Borehole No.	na	na	na	BH16-9	BH16-11	BH16-12	BH16-13	BH16-14	na	na	na	na	na
Calculated Parameters													
Fraction of Organic Carbon	0.0005	g/g	na	0.011	0.0024	0.0006	0.012	0.0005	0.005	0.0077	43%	0.0006	0.0061
Fraction of Organic Carbon (rep.#1)	0.0005	g/g	na	0.01	0.0025	0.0007	0.0037	0.0005	0.011	0.009	20%	0.0007	0.0059
Fraction of Organic Carbon (rep.#2)	0.0005	g/g	na	0.014	0.0023	0.0008	0.0041	0.0005	0.0097	0.011	13%	0.0006	0.0063
Average FOC Result	0.0005	g/g	na	0.012	0.0024	0.0007	0.0065	0.0005	0.0085	0.0091	7%	0.0006	0.0061
Inorganics													
Total Organic Carbon	500	mg/kg	na	11000	2400	620	12000	540	5000	7700	43%	640	6100
Total Organic Carbon (repeat #1)	500	mg/kg	na	10000	2500	700	3700	510	11000	9000	20%	650	5900
Total Organic Carbon (repeat #2)	500	mg/kg	na	14000	2300	780	4100	520	9700	11000	13%	620	6300

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for S Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

g/g grams per gram
mg/kg milligrams per kilogram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
na Not Applicable
< #### Concentration less than laboratory RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.6
SOIL ANALYTICAL RESULTS - GRAIN SIZE
FirstGroup America
1830 Trim Road
Orleans, Ontairo

Arcadis Sample No.	Units	RDL	Grain Size	G.S-1	G.S-2	G.S-3	Grain 1	Grain 2	Grain 3
Laboratory Sample No.	na	na	BWG390	OQ4621	OQ4622	OQ4623	TC2480	TC2481	TC2482
Date Sampled	na	na	16-Feb-16	12-May-16	12-May-16	12-May-16	13-Mar-18	13-Mar-18	13-Mar-18
Miscellaneous Parameters									
Grain Size	na	na	Fine	na	na	na	na	na	na
Sieve - #200 (<0.075mm)	%	na	96	na	na	na	na	na	na
Sieve - #200 (>0.075mm)	%	na	4	na	na	na	na	na	na
Physical Properties									
% Sand by Hydrometer	%	2.0	na	7.6	27	12	7.2	3.8	6.2
% Silt by Hydrometer	%	2.0	na	16	22	17	61.1	59.1	60.8
Clay Content (smaller than 75 um diamete	%	2.0	na	76	51	71	31.7	37.1	33
Texture	na	na	na	Heavy Clay	Clay	Heavy Clay	Fine Soil	Fine Soil	Fine Soil

Notes:

na Not Applicable

RDL Laboratory reportable detection limit

Fine grained means 50% or more by mass of particles that are smaller than 75 micrometres.

Arcadis Sample No.	RDL	Units	Schedule 4 Leachate Criteria[1]	TCLP
Laboratory Sample No.	na	na	na	EIW958
Date Sampled	na	na	na	9-May-17
Sample depth (m bgs)	na	na	na	na
CGM Reading (ppmv)	na	na	na	<5
Borehole No.	na	na	na	Stockpile
Inorganics				
Moisture	0.2	%	na	4.1
Polyaromatic Hydrocarbons				
Leachable Benzo(a)pyrene	0.10	µg/L	1	<0.10
Inorganics				
Leachable Fluoride (F-)	0.10	mg/L	150	0.24
Leachable Free Cyanide	0.010	mg/L	20	<0.010
Leachable Nitrite (N)	0.10	mg/L	na	<0.10
Leachable Nitrate (N)	1.0	mg/L	na	<1.0
Leachable Nitrate + Nitrite (N)	1.0	mg/L	1000	<1.0
Final pH	na	pH	na	6.37
Initial pH	na	pH	na	9.44
TCLP - % Solids	0.2	%	na	100
TCLP Extraction Fluid	na	na	na	FLUID 1
Ignitability	na	na	na	NF/NI
Conductivity	0.002	mS/cm	na	0.084
Hydrocarbons				
Benzene	0.02	µg/g	na	<0.02
Toluene	0.02	µg/g	na	<0.02
Ethylbenzene	0.02	µg/g	na	<0.02
o-Xylene	0.02	µg/g	na	<0.02
p+m-Xylene	0.04	µg/g	na	<0.04
Total Xylenes	0.04	µg/g	na	<0.04
F1 (C6-C10)	10	µg/g	na	<10
F1 (C6-C10) - BTEX	10	µg/g	na	<10
F2 (C10-C16 Hydrocarbons)	10	µg/g	na	<10
Gasoline	10	µg/g	na	<10
Diesel (C10-C24)	10	µg/g	na	130
Oil & Grease Mineral/Synthetic	100	µg/g	na	11000

Table 9.7
SOIL ANALYTICAL RESULTS - Toxicity Characteristic Leaching Procedure
FirstGroup America
1830 Trim Road
Orleans, Ontairo

Arcadis Sample No.	RDL	Units	Schedule 4 Leachate Criteria[1]	TCLP
Laboratory Sample No.	na	na	na	EIW958
Date Sampled	na	na	na	9-May-17
Sample depth (m bgs)	na	na	na	na
CGM Reading (ppmv)	na	na	na	<5
Borehole No.	na	na	na	Stockpile
Metals				
Leachable Mercury (Hg)	0.0010	mg/L	0.1	<0.0010
Leachable Arsenic (As)	0.2	mg/L	2.5	<0.2
Leachable Barium (Ba)	0.2	mg/L	100	0.8
Leachable Boron (B)	0.1	mg/L	500	0.1
Leachable Cadmium (Cd)	0.05	mg/L	0.5	<0.05
Leachable Chromium (Cr)	0.1	mg/L	5	<0.1
Leachable Lead (Pb)	0.1	mg/L	5	<0.1
Leachable Selenium (Se)	0.1	mg/L	1	<0.1
Leachable Silver (Ag)	0.01	mg/L	5	<0.01
Leachable Uranium (U)	0.01	mg/L	10	<0.01
PCBs				
Leachable Total PCB	3.0	µg/L	300	<3.0
Volatile Organics				
Leachable Benzene	0.020	mg/L	0.5	<0.020
Leachable Carbon Tetrachloride	0.020	mg/L	0.5	<0.020
Leachable Chlorobenzene	0.020	mg/L	8	<0.020
Leachable Chloroform	0.020	mg/L	10	<0.020
Leachable 1,2-Dichlorobenzene	0.050	mg/L	20	<0.050
Leachable 1,4-Dichlorobenzene	0.050	mg/L	0.5	<0.050
Leachable 1,2-Dichloroethane	0.050	mg/L	0.5	<0.050
Leachable 1,1-Dichloroethylene	0.020	mg/L	1.4	<0.020
Leachable Methylene Chloride(Dichloromethane)	0.20	mg/L	5	<0.20
Leachable Methyl Ethyl Ketone (2-Butanone)	1.0	mg/L	200	<1.0
Leachable Tetrachloroethylene	0.020	mg/L	3	<0.020
Leachable Trichloroethylene	0.020	mg/L	5	<0.020
Leachable Vinyl Chloride	0.020	mg/L	0.2	<0.020

Notes:

[1] Ontario Regulation 558/00, Schedule 4 Leachate Quality Criteria

µg/g micrograms per gram
mg/L milligrams per litre
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference
na Not Applicable
NF/NI Not Flammable and Not Ignitable
< #### Concentration less than laboratory RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.8A
MONITORING WELL DATA - February/March 2016
FirstGroup America
1830 Trim Road
Orleans, Ontario

Monitoring Well No.	Date	CGM Reading	Ground Elevation[1]	Top of Casing Elevation[1]	Depth of Well	Screened Interval	LNAPL Thickness	Depth to Water	Ground Water Elevation
		ppmv	m ald	m ald	m bgs	m bgs	m	m bgs	m ald
MW16-1	18-Feb-16	<5	99.56	99.49	4.48	1.5 - 4.5	ND	1.12	98.45 *
MW16-2	18-Feb-16	<5	99.65	99.40	4.64	1.5 - 4.6	ND	1.47	98.17 *
MW16-3	18-Feb-16	<5	99.77	99.66	4.40	1.5 - 4.4	ND	1.17	98.60 *
MW16-4	18-Feb-16	<5	99.76	99.56	4.48	1.5 - 4.5	ND	1.17	98.59 *
MW16-5	01-Mar-16	<5	100.01	100.02	4.56	1.5 - 4.6	ND	2.12	97.89

Notes:

[1] Top of casing and ground surface elevations surveyed by Arcadis personnel on March 08, 2016. Elevations measured relative to a local site benchmark (concrete foundation) assigned an arbitrary elevation of 100 m.

CGM combustible gas meter
LNAPL light non-aqueous phase liquid
ppmv parts per million by volume equivalent hexane
m metres
m bgs metres below ground surface
m ald metres above local datum
ND not detected
* water elevation above well screen

Table 9.8B
MONITORING WELL DATA - May 2016
FirstGroup America
1830 Trim Road
Orleans, Ontario

Monitoring Well No.	Date	CGM Reading	Ground Elevation[1]	Top of Casing Elevation[1]	Depth of Well	Screened Interval	LNAPL Thickness	Depth to Water	Ground Water Elevation
		ppmv	m ald	m ald	m bgs	m bgs	m	m bgs	m ald
MW16-1	09-May-16	<5	99.56	99.49	4.42	1.5 - 4.5	ND	0.74	98.82 *
MW16-2	09-May-16	<5	99.65	99.40	4.44	1.5 - 4.6	ND	0.65	98.99 *
MW16-3	09-May-16	<5	99.77	99.66	4.36	1.5 - 4.4	ND	0.81	98.96 *
MW16-4	09-May-16	<5	99.76	99.56	4.17	1.5 - 4.5	ND	0.67	99.09 *
MW16-5	09-May-16	<5	100.01	100.02	4.52	1.5 - 4.6	ND	0.48	99.53 *

Notes:

[1] Top of casing and ground surface elevations surveyed by Arcadis personnel on March 08, 2016. Elevations measured relative to a local site benchmark (concrete foundation) assigned an arbitrary elevation of 100 m.

CGM combustible gas meter
LNAPL light non-aqueous phase liquid
ppmv parts per million by volume equivalent hexane
m metres
m bgs metres below ground surface
m ald metres above local datum
ND not detected
* water elevation above well screen

Table 9.8C
MONITORING WELL DATA - May 2017
FirstGroup America
1830 Trim Road
Orleans, Ontario

Monitoring Well No.	Date	CGM Reading	Ground Elevation[1]	Top of Casing Elevation[1]	Depth of Well	Screened Interval	LNAPL Thickness	Depth to Water	Depth to Water	Ground Water Elevation
		ppmv	m ald	m ald	m bgs	m bgs	m	m btoc	m bgs	m ald
MW16-1	23-May-17	-	99.434	99.427	4.426	1.5 - 4.5	ND	0.591	0.598	98.836 *
MW16-2	23-May-17	-	99.506	99.251	4.606	1.5 - 4.6	ND	0.314	0.569	98.937 *
MW16-3	23-May-17	-	99.672	99.564	4.409	1.5 - 4.4	ND	0.779	0.887	98.785 *
MW16-4	23-May-17	-	99.690	99.535	4.342	1.5 - 4.5	ND	0.568	0.723	98.967 *
MW16-5	23-May-17	-	99.996	100.010	4.551	1.5 - 4.6	ND	1.430	1.416	98.563 *
MW17-1	23-May-17	-	99.972	100.914	3.405	0.3 - 3.3	ND	2.375	1.433	98.539
MW17-2	23-May-17	-	99.966	100.562	3.426	0.3 - 3.3	ND	1.850	1.254	98.712
MW17-3	23-May-17	-	99.699	100.661	3.367	0.3 - 3.3	ND	3.660	2.698	97.001
MW17-4	23-May-17	-	99.505	100.418	3.384	0.3 - 3.3	ND	2.543	1.630	97.875
MW17-5	23-May-17	-	98.979	99.770	3.341	0.3 - 3.3	ND	2.722	1.931	97.048
MW17-6	23-May-17	-	98.976	99.980	3.028	0.3 - 3.3	ND	2.704	1.700	97.276
MW17-7	23-May-17	-	99.373	100.332	2.732	0.3 - 2.7	ND	1.508	0.549	98.824
MW17-8	23-May-17	-	99.737	100.569	3.232	0.3 - 3.3	ND	1.893	1.061	98.676
MW17-9	23-May-17	-	99.671	100.519	3.595	0.3 - 3.3	ND	1.713	0.865	98.806
MW17-11	25-Aug-17	-	99.671	100.221	7.120	4.07 - 7.12	ND	4.700	4.150	95.521

Notes:

[1] Top of casing and ground surface elevations surveyed by Arcadis personnel on May 25, 2017. Elevations measured relative to a local site benchmark (concrete foundation inside garage) assigned an arbitrary elevation of 100 m.

CGM combustible gas meter
LNAPL light non-aqueous phase liquid
ppmv parts per million by volume equivalent hexane
m metres
m bgs metres below ground surface
m ald metres above local datum
ND not detected
* water elevation above well screen

Table 9.8D
MONITORING WELL DATA - September 2017
FirstGroup America
1830 Trim Road
Orleans, Ontario

Monitoring Well No.	Date	CGM Reading	Ground Elevation[1]	Top of Casing Elevation[1]	Depth of Well	Screened Interval	Depth to Water	Ground Water Elevation
		ppmv	m ald	m ald	m bgs	m bgs	m bgs	m ald
MW17-3	28-Sep-17	-	99.699	100.661	3.367	0.3 - 3.3	0.848	98.851
MW17-4	28-Sep-17	-	99.505	100.418	3.384	0.3 - 3.3	0.767	98.738
MW17-5	28-Sep-17	-	98.979	99.770	3.341	0.3 - 3.3	0.979	98.000
MW17-6	28-Sep-17	-	98.976	99.980	3.028	0.3 - 3.3	0.996	97.980
MW17-7	28-Sep-17	-	99.373	100.332	2.732	0.3 - 2.7	0.821	98.552
MW17-8	28-Sep-17	-	99.737	100.569	3.232	0.3 - 3.3	1.038	98.699
MW17-9	28-Sep-17	-	99.671	100.519	3.595	0.3 - 3.3	1.052	98.619

Notes:

[1] Top of casing and ground surface elevations surveyed by Arcadis personnel on May 25, 2017. Elevations measured relative to a local site benchmark (concrete foundation inside garage) assigned an arbitrary elevation of 100 m.

CGM combustible gas meter
LNAPL light non-aqueous phase liquid
ppmv parts per million by volume equivalent hexane
m metres
m bgs metres below ground surface
m ald metres above local datum
ND not detected
* water elevation above well screen

Table 9.8E
MONITORING WELL DATA - November 2017
FirstGroup America
1830 Trim Road
Orleans, Ontario

Monitoring Well No.	Date	CGM Reading	Ground Elevation[1]	Top of Casing Elevation[1]	Depth of Well	Screened Interval	Depth to Water	Ground Water Elevation
		ppmv	m ald	m ald	m bgs	m bgs	m bgs	m ald
MW16-4	01-Nov-17	-	99.690	99.535	4.342	1.5 - 4.5	0.910	98.780 *
MW17-2	01-Nov-17	-	99.966	100.562	3.426	0.3 - 3.3	1.254	98.712
MW17-9	01-Nov-17	-	99.671	100.519	3.595	0.3 - 3.3	0.682	98.989
MW17-11	01-Nov-17	-	99.671	100.221	7.120	4.07 - 7.12	1.150	98.521

Notes:

[1] Top of casing and ground surface elevations surveyed by Arcadis personnel on May 25, 2017. Elevations measured relative to a local site benchmark (concrete foundation inside garage) assigned an arbitrary elevation of 100 m.

CGM combustible gas meter
LNAPL light non-aqueous phase liquid
ppmv parts per million by volume equivalent hexane
m metres
m bgs metres below ground surface
m ald metres above local datum
ND not detected
* water elevation above well screen

Table 9.8F
MONITORING WELL DATA - March 2018
FirstGroup America
1830 Trim Road
Orleans, Ontario

Monitoring Well No.	Date	CGM Reading	Ground Elevation[1]	Top of Casing Elevation[1]	Depth of Well	Screened Interval	Depth to Water	Depth to Water	Ground Water Elevation
		ppmv	m ald	m ald	m bgs	m bgs	m btoc	m bgs	m ald
MW17-3	13-Mar-18	-	99.699	100.661	3.367	0.3 - 3.3	1.386	0.424	99.275
MW17-4	13-Mar-18	-	99.505	100.418	3.384	0.3 - 3.3	1.132	0.219	99.286
MW17-5	13-Mar-18	-	98.979	99.770	3.341	0.3 - 3.3	1.761	0.970	98.009
MW17-6	13-Mar-18	-	98.976	99.980	3.028	0.3 - 3.3	1.047	0.043	98.933
MW17-7	13-Mar-18	-	99.373	100.332	2.732	0.3 - 2.7	1.867	0.908	98.465
MW17-8	13-Mar-18	-	99.737	100.569	3.232	0.3 - 3.3	1.370	0.538	99.199
MW17-9	13-Mar-18	-	99.671	100.519	3.595	0.3 - 3.3	1.482	0.634	99.037
MW17-11	13-Mar-18	-	99.671	100.221	7.120	4.07 - 7.12	1.435	0.885	98.786

Notes:

[1] Top of casing and ground surface elevations surveyed by Arcadis personnel on May 25, 2017. Elevations measured relative to a local site benchmark (concrete foundation inside garage) assigned an arbitrary elevation of 100 m.

CGM combustible gas meter
LNAPL light non-aqueous phase liquid
ppmv parts per million by volume equivalent hexane
m metres
m bgs metres below ground surface
m ald metres above local datum
ND not detected
* water elevation above well screen
water in well is frozen; water elevations may be skewed due to frozen conditions encountered

Table 9.9
GROUND WATER ANALYTICAL RESULTS - PHCs and VOCs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	MW16-1	DUP-1	RPD	MW16-2	MW16-3	MW16-4	MW16-5	MW17-1	MW17-2	MW17-3	MW17-4	MW17-5	MW17-6	MW17-7	MW17-8	MW17-9	DUP-1	RPD	Field Blank	Trip Blank
Laboratory Sample No.	na	na	na	BWP031	BWP035	na	BWP032	BWP033	BWP034	BYH564	ELH048	ELH049	ELH050	ELH051	ELH052	ELH053	ELH054	ELH055	ELH056	ELH057	na	BYH565	BYH566
Date Sampled	na	na	na	18-Feb-16	18-Feb-16	na	18-Feb-16	18-Feb-16	18-Feb-16	1-Mar-16	24-May-17	24-May-17	24-May-17	23-May-17	24-May-17	24-May-17	24-May-17	23-May-17	23-May-17	23-May-17	na	1-Mar-16	1-Mar-16
Monitoring Well No.	na	na	na	MW16-1	MW16-1	na	MW16-2	MW16-3	MW16-4	MW16-5	MW17-1	MW17-2	MW17-3	MW17-4	MW17-5	MW17-6	MW17-7	MW17-8	MW17-9	MW17-9	na	Field Blank	Trip Blank
Calculated Parameters																							
1,3-Dichloropropene (cis+trans)	0.50	ug/L	0.5	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Volatile Organics																							
Acetone (2-Propanone)	10	ug/L	2700	<10	<10	nc	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-	-	-	<10	<10
Benzene	0.20	ug/L	0.5	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	nc	<0.20	<0.20
Bromodichloromethane	0.50	ug/L	16	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Bromoform	1.0	ug/L	5	<1.0	<1.0	nc	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0
Bromomethane	0.50	ug/L	0.89	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Carbon Tetrachloride	0.20	ug/L	0.2	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
Chlorobenzene	0.20	ug/L	30	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
Chloroform	0.20	ug/L	2	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
Dibromochloromethane	0.50	ug/L	25	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,2-Dichlorobenzene	0.50	ug/L	3	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,3-Dichlorobenzene	0.50	ug/L	59	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,4-Dichlorobenzene	0.50	ug/L	0.5	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Dichlorodifluoromethane (FREON 12)	1.0	ug/L	590	<1.0	<1.0	nc	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0
1,1-Dichloroethane	0.20	ug/L	5	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
1,2-Dichloroethane	0.50	ug/L	0.5	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,1-Dichloroethylene	0.20	ug/L	0.5	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
cis-1,2-Dichloroethylene	0.50	ug/L	1.6	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
trans-1,2-Dichloroethylene	0.50	ug/L	1.6	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,2-Dichloropropane	0.20	ug/L	0.58	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
cis-1,3-Dichloropropene	0.30	ug/L	na	<0.30	<0.30	nc	<0.30	<0.30	<0.30	<0.30	-	-	-	-	-	-	-	-	-	-	-	<0.30	<0.30
trans-1,3-Dichloropropene	0.40	ug/L	na	<0.40	<0.40	nc	<0.40	<0.40	<0.40	<0.40	-	-	-	-	-	-	-	-	-	-	-	<0.40	<0.40
Ethylbenzene	0.20	ug/L	2.4	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	nc	<0.20	<0.20
Ethylene Dibromide	0.20	ug/L	0.2	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
Hexane	1.0	ug/L	5	<1.0	<1.0	nc	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0
Methylene Chloride (Dichloromethane)	2.0	ug/L	26	<2.0	<2.0	nc	<2.0	<2.0	<2.0	<2.0	-	-	-	-	-	-	-	-	-	-	-	<2.0	<2.0
Methyl Ethyl Ketone (2-Butanone)	10	ug/L	1800	<10	<10	nc	<10	<10	<10	<10	-	-	-	-	-	-	-	-	-	-	-	<10	<10
Methyl Isobutyl Ketone	5.0	ug/L	640	<5.0	<5.0	nc	<5.0	<5.0	<5.0	<5.0	-	-	-	-	-	-	-	-	-	-	-	<5.0	<5.0
Methyl t-butyl ether (MTBE)	0.50	ug/L	15	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Styrene	0.50	ug/L	5.4	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.50	ug/L	1.1	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
1,1,2,2-Tetrachloroethane	0.50	ug/L	0.5	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Tetrachloroethylene	0.20	ug/L	0.5	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
Toluene	0.20	ug/L	24	<0.20	<0.20	nc	<0.20	0.22	0.77	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	nc	<0.20	<0.20
1,1,1-Trichloroethane	0.20	ug/L	23	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
1,1,2-Trichloroethane	0.50	ug/L	0.5	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Trichloroethylene	0.20	ug/L	0.5	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
Trichlorofluoromethane (FREON 11)	0.50	ug/L	150	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	-	-	<0.50	<0.50
Vinyl Chloride	0.20	ug/L	0.5	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	<0.20	<0.20
p+m-Xylene	0.20	ug/L	na	<0.20	<0.20	nc	<0.20	<0.20	0.32	<0.20	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	nc	<0.20	<0.20
o-Xylene	0.20	ug/L	na	<0.20	<0.20	nc	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	nc	<0.20	<0.20
Total Xylenes	0.20	ug/L	72	<0.20	<0.20	nc	<0.20	<0.20	0.32	<0.20	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	nc	<0.20	<0.20
BTEX & F1 Hydrocarbons																							
F1 (C6-C10)	25	ug/L	420	<25	<25	nc	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	nc	<25	<25
F1 (C6-C10) - BTEX	25	ug/L	420	<25	<25	nc	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	nc	<25	<25
F2-F4 Hydrocarbons																							
F2 (C10-C16 Hydrocarbons)	100	ug/L	150	<100	<100	nc	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	nc	<100	<100
F3 (C16-C34 Hydrocarbons)	200	ug/L	500	<200	<200	nc	<200	<200	<200	<200	-	-	-	-	-	-	-	-	-	-	-	<200	<200
F4 (C34-C50 Hydrocarbons)	200	ug/L	500	<200	<200	nc	<200	<200	<200	<200	-	-	-	-	-	-	-	-	-	-	-	<200	<200

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011, Table 6; Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and All Types of Property Use

µg/L micrograms per litre
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommendations are RPDs < 30% for PHCs in water and soil; <30% for VOCs in water and <50% VOCs in soil
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.10
GROUND WATER ANALYTICAL RESULTS - Metals and Inorganics
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOE Table 6 Standards[1]	MW16-1	DUP-1	RPD	MW16-2	MW16-3	MW16-4	MW16-5		DUP-1	RPD	MW17-1	MW17-2	MW17-3	MW17-4	MW17-5	MW17-6	MW17-7	DUP-2	RPD	MW17-8	MW17-9	DUP-1	RPD	MW17-11	DUP-8	RPD	Field Blank
Laboratory Sample No.	na	na	na	BWP031	BWP035	na	BWP032	BWP033	BWP034	BYH564	BZF769	BZF770	na	ELH048	ELH049	ELH050	ELH051	ELH052	ELH053	ELH054	ELH058	na	ELH055	ELH056	ELH057	na	FAP233	FAP234	na	BZF771
Date Sampled	na	na	na	18-Feb-16	18-Feb-16	na	18-Feb-16	18-Feb-16	18-Feb-16	1-Mar-16	8-Mar-16	8-Mar-16	na	24-May-17	24-May-17	23-May-17	23-May-17	24-May-17	24-May-17	24-May-17	24-May-17	na	23-May-17	23-May-17	23-May-17	na	25-Aug-17	25-Aug-17	25-Aug-17	8-Mar-16
Monitoring Well No.	na	na	na	MW16-1	MW16-1	na	MW16-2	MW16-3	MW16-4	MW16-5	MW16-5	MW16-5	na	MW17-1	MW17-2	MW17-3	MW17-4	MW17-5	MW17-6	MW17-7	MW17-7	na	MW17-8	MW17-9	MW17-9	na	MW17-11	MW17-11	na	Field Blank
Inorganics																														
Free Cyanide	2	ug/L	52	<2	<2	nc	<2	<2	<2	<2	-	-	-						<1	<1	<1	nc		-	-	nc	nc	nc	nc	-
Chloride	1.0	mg/L	790	34	34	0%	570	320	**1100**	80	-	-	-	**880**	390	140	140	11	1.3	120	-	nc	490	**910**	**900**	1%	73	72	1%	-
Phenols	0.0010	mg/L	0.89	-	-	na	-	-	-	-	<0.0010	<0.0010	nc						-	-	-	nc		-	-	nc	-	-	-	<0.0010
pH	na	na	na	-	-	na	-	-	-	7.91	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Metals																														
Chromium (VI)	0.50	ug/L	25	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Mercury	0.1	ug/L	0.1	<0.1	<0.1	nc	<0.1	<0.1	<0.1	<0.1	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Antimony	0.50	ug/L	6	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Arsenic	1.0	ug/L	25	<1.0	<1.0	nc	<1.0	<1.0	<2.0	1.0	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Barium	2.0	ug/L	1000	74	74	0%	110	38	140	130	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Beryllium	0.50	ug/L	4	<0.50	<0.50	nc	<0.50	<0.50	<0.50	<0.50	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Boron	10	ug/L	5000	52	50	4%	54	66	64	56	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Cadmium	0.10	ug/L	2.1	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Chromium	5.0	ug/L	50	<5.0	<5.0	nc	<5.0	<5.0	<5.0	<5.0	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Cobalt	0.50	ug/L	3.8	<0.50	<0.50	nc	1.8	1.5	1.1	<0.50	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Copper	1.0	ug/L	69	<1.0	<1.0	nc	<1.0	1.3	<1.0	2.3	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Lead	0.50	ug/L	10	<0.50	<0.50	nc	0.77	<0.50	<0.50	<0.50	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Molybdenum	0.50	ug/L	70	3.9	4.2	7%	2.3	0.94	3.5	13	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Nickel	1.0	ug/L	100	<1.0	<1.0	nc	1.4	5.4	2.1	1.1	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Selenium	2.0	ug/L	10	<2.0	<2.0	nc	<2.0	<2.0	<2.0	<2.0	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Silver	0.10	ug/L	1.2	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Sodium	100	ug/L	490000	58000	57000	2%	95000	290000	410000	66000	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Thallium	0.050	ug/L	2	<0.050	<0.050	nc	<0.050	0.058	<0.050	<0.050	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Uranium	0.10	ug/L	20	13	13	0%	19	4.4	**22**	7.2	-	-	-	**47**	13	13	13	9.6	4.7	3.1	-	nc	8.2	**23**	**23**	0%	9.2	9.3	1%	-
Vanadium	0.50	ug/L	6.2	1.1	1.2	9%	3.2	<0.50	2.8	1.5	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-
Zinc	5.0	ug/L	890	<5.0	<5.0	nc	<5.0	<10	<5.0	<5.0	-	-	-						-	-	-	nc		-	-	nc	-	-	-	-

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and All Types of Property Use

ug/L micrograms per litre
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommended RPDs are <20% for water and <30% for soil
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL
- Not Analysed
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.11
GROUND WATER ANALYTICAL RESULTS - PESTICIDES and HERBICIDES
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	MW16-1	DUP-1	RPD
Laboratory Sample No.	na	na	na	BWP031	BWP035	na
Date Sampled	na	na	na	18-Feb-16	18-Feb-16	na
Monitoring Well No.	na	na	na	MW16-1	MW16-1	na
Calculated Parameters						
Chlordane (Total)	0.005	ug/L	0.06	<0.005	<0.005	nc
o,p-DDD + p,p-DDD	0.005	ug/L	1.8	<0.005	<0.005	nc
o,p-DDE + p,p-DDE	0.005	ug/L	10	<0.005	<0.005	nc
o,p-DDT + p,p-DDT	0.005	ug/L	0.05	<0.005	<0.005	nc
Total Endosulfan	0.005	ug/L	0.56	<0.005	<0.005	nc
Total PCB	0.05	ug/L	0.2	<0.05	<0.05	nc
Pesticides & Herbicides						
Aldrin	0.005	ug/L	0.35	<0.005	<0.005	nc
Dieldrin	0.005	ug/L	0.35	<0.005	<0.005	nc
a-Chlordane	0.005	ug/L	na	<0.005	<0.005	nc
g-Chlordane	0.005	ug/L	na	<0.005	<0.005	nc
o,p-DDD	0.005	ug/L	na	<0.005	<0.005	nc
p,p-DDD	0.005	ug/L	na	<0.005	<0.005	nc
o,p-DDE	0.005	ug/L	na	<0.005	<0.005	nc
p,p-DDE	0.005	ug/L	na	<0.005	<0.005	nc
o,p-DDT	0.005	ug/L	na	<0.005	<0.005	nc
p,p-DDT	0.005	ug/L	na	<0.005	<0.005	nc
Lindane	0.003	ug/L	0.95	<0.003	<0.003	nc
Endosulfan I (alpha)	0.005	ug/L	na	<0.005	<0.005	nc
Endosulfan II (beta)	0.005	ug/L	na	<0.005	<0.005	nc
Endrin	0.005	ug/L	0.36	<0.005	<0.005	nc
Heptachlor	0.005	ug/L	0.038	<0.005	<0.005	nc
Heptachlor epoxide	0.005	ug/L	0.038	<0.005	<0.005	nc
Hexachlorobenzene	0.005	ug/L	1	<0.005	<0.005	nc
Hexachlorobutadiene	0.009	ug/L	0.012	<0.009	<0.009	nc
Hexachloroethane	0.01	ug/L	0.17	<0.01	<0.01	nc
Methoxychlor	0.01	ug/L	0.3	<0.01	<0.01	nc
Aroclor 1242	0.05	ug/L	na	<0.05	<0.05	nc
Aroclor 1248	0.05	ug/L	na	<0.05	<0.05	nc
Aroclor 1254	0.05	ug/L	na	<0.05	<0.05	nc
Aroclor 1260	0.05	ug/L	na	<0.05	<0.05	nc

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and All Types of Property Use

µg/L micrograms per litre
RDL Laboratory reportable detection limit
RPD Relative percent difference
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.12
GROUND WATER ANALYTICAL RESULTS - PAHs
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	MOECC Table 6 Standards[1]	MW16-1	DUP-1	RPD	MW16-2	MW16-3	MW16-4	MW16-5
Laboratory Sample No.	na	na	na	BWP031	BWP035	na	BWP032	BWP033	BWP034	BYH564
Date Sampled	na	na	na	18-Feb-16	18-Feb-16	na	18-Feb-16	18-Feb-16	18-Feb-16	1-Mar-16
Monitoring Well No.	na	na	na	MW16-1	MW16-1	na	MW16-2	MW16-3	MW16-4	MW16-5
Calculated Parameters										
Methylnaphthalene, 2-(1-)	0.071	ug/L	3.2	<0.071	<0.071	nc	<0.071	<0.071	<0.071	<0.071
Polyaromatic Hydrocarbons										
Biphenyl	0.050	ug/L	na	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Acenaphthene	0.050	ug/L	4.1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	0.050	ug/L	1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Anthracene	0.050	ug/L	1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Benzo(a)anthracene	0.050	ug/L	1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	0.010	ug/L	0.01	<0.010	<0.010	nc	<0.010	<0.010	<0.010	<0.010
Benzo(b/j)fluoranthene	0.050	ug/L	0.1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	0.050	ug/L	0.2	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	0.050	ug/L	0.1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Chrysene	0.050	ug/L	0.1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	0.050	ug/L	0.2	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Fluoranthene	0.050	ug/L	0.41	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Fluorene	0.050	ug/L	120	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.050	ug/L	0.2	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
1-Methylnaphthalene	0.050	ug/L	na	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	0.050	ug/L	na	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050
Naphthalene	0.050	ug/L	7	<0.050	<0.050	nc	<0.050	0.06	<0.050	0.063
Phenanthrene	0.030	ug/L	1	<0.030	<0.030	nc	<0.030	<0.030	<0.030	0.031
Pyrene	0.050	ug/L	4.1	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and All Types of Property Use

µg/L micrograms per litre
RDL Laboratory reportable detection limit
RPD Relative percent difference
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL
VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

Table 9.13
GROUND WATER ANALYTICAL RESULTS - Glycols
FirstGroup America
1830 Trim Road
Orleans, Ontario

Arcadis Sample No.	RDL	Units	CCME Standards[1]	MW16-4-G	DUP-G	RPD	MW17-2-G
Laboratory Sample No.	na	na	na	FLN719	FLN721	na	FLN720
Date Sampled	na	na	na	1-Nov-17	1-Nov-17	na	1-Nov-17
Monitoring Well No.	na	na	na	MW16-4	MW16-4	na	MW17-2
Glycols							
Propylene Glycol	5	mg/L	500	<5	<5	nc	<5
Ethylene Glycol	5	mg/L	192	<5	<5	nc	<5
Diethylene Glycol	5	mg/L	nrg	<5	<5	nc	<5

Notes:

[1] Canadian Water Quality Guidelines for Glycols for the Protection of Aquatic Life (CCME 1997)

mg/L milligrams per litre

RDL Laboratory reportable detection limit

RPD Relative percent difference

na Not Applicable

nc Not Calculated - one (1) or more concentrations less than 5 times RDL

nrg No Recommended Guideline

Table 9.14
SOIL ANALYTICAL RESULTS - MAXIMUM CONCENTRATIONS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Soil Parameter	Units	MOE Table 6 Standards[3]	Maximum Value	Location of Maximum Value
Acetone (2-Propanone)	ug/g	28	<1.0	multiple locations
Benzene	ug/g	0.17	<0.040	multiple locations
Bromodichloromethane	ug/g	1.9	<0.10	multiple locations
Bromoform	ug/g	0.26	<0.10	multiple locations
Bromomethane	ug/g	0.05	**<0.10**	multiple locations
Carbon Tetrachloride	ug/g	0.12	<0.10	multiple locations
Chlorobenzene	ug/g	2.7	<0.10	multiple locations
Chloroform	ug/g	0.17	<0.10	multiple locations
Dibromochloromethane	ug/g	2.9	<0.10	multiple locations
1,2-Dichlorobenzene	ug/g	1.7	<0.10	multiple locations
1,3-Dichlorobenzene	ug/g	6	<0.10	multiple locations
1,4-Dichlorobenzene	ug/g	0.097	**<0.10**	multiple locations
Dichlorodifluoromethane (FREON 12)	ug/g	25	<0.10	multiple locations
1,1-Dichloroethane	ug/g	0.6	<0.10	multiple locations
1,2-Dichloroethane	ug/g	0.05	**<0.10**	multiple locations
1,1-Dichloroethylene	ug/g	0.05	**<0.10**	multiple locations
cis-1,2-Dichloroethylene	ug/g	2.5	<0.10	multiple locations
trans-1,2-Dichloroethylene	ug/g	0.75	<0.10	multiple locations
1,2-Dichloropropane	ug/g	0.085	**<0.10**	multiple locations
cis-1,3-Dichloropropene	ug/g	na	<0.060	multiple locations
trans-1,3-Dichloropropene	ug/g	na	<0.080	multiple locations
Ethylbenzene	ug/g	1.6	<0.040	multiple locations
Ethylene Dibromide	ug/g	0.05	**<0.10**	multiple locations
Hexane	ug/g	34	0.13	BH16-9-1
Methylene Chloride(Dichloromethane)	ug/g	0.96	<0.10	multiple locations
Methyl Ethyl Ketone (2-Butanone)	ug/g	44	<1.0	multiple locations
Methyl Isobutyl Ketone	ug/g	4.3	<1.0	multiple locations
Methyl t-butyl ether (MTBE)	ug/g	1.4	<0.10	multiple locations
Styrene	ug/g	2.2	<0.10	multiple locations
1,1,1,2-Tetrachloroethane	ug/g	0.05	**<0.10**	multiple locations
1,1,2,2-Tetrachloroethane	ug/g	0.05	**<0.10**	multiple locations
Tetrachloroethylene	ug/g	2.3	<0.10	multiple locations
Toluene	ug/g	6	0.041	BH16-9-1
1,1,1-Trichloroethane	ug/g	3.4	<0.10	multiple locations
1,1,2-Trichloroethane	ug/g	0.05	**<0.10**	multiple locations
Trichloroethylene	ug/g	0.52	<0.10	multiple locations
Trichlorofluoromethane (FREON 11)	ug/g	5.8	<0.10	multiple locations
Vinyl Chloride	ug/g	0.022	**<0.040**	multiple locations
p+m-Xylene	ug/g	na	0.057	BH16-9-1
o-Xylene	ug/g	na	<0.040	multiple locations
Total Xylenes	ug/g	25	0.057	BH16-9-1
F1 (C6-C10)	ug/g	65	<30	BH16-2-2
F1 (C6-C10) - BTEX	ug/g	65	<30	BH16-2-2
F2 (C10-C16 Hydrocarbons)	ug/g	150	<20	BH16-2-2
F3 (C16-C34 Hydrocarbons)	ug/g	1300	<100	BH16-2-2
F4 (C34-C50 Hydrocarbons)	ug/g	5600	<100	BH16-2-2
Sodium Adsorption Ratio	na	-	4.5	BH16-4-1
Conductivity	mS/cm	-	**2.6**	BH16-9-1
Free Cyanide	ug/g	-	**0.28**	BH16-17-1
Moisture	%	-	40	BH16-2-2
Available (CaCl2) pH	pH	-	7.92	BH16-5-2
Soluble Calcium (Ca)	mg/L	-	575	BH16-9-1
Soluble Magnesium (Mg)	mg/L	-	75.5	BH16-3-2
Soluble Sodium (Na)	mg/L	-	230	BH16-3-2
Chromium (VI)	ug/g	-	0.5	BH17-3-2
Boron (Hot Water Soluble)	ug/g	-	0.67	BH16-9-1
Antimony	ug/g	-	<0.2	multiple locations
Arsenic	ug/g	-	4	BH16-9-1
Barium	ug/g	-	**490**	TP16-4-1 DUP
Beryllium	ug/g	-	1.3	multiple locations
Boron (Total)	ug/g	-	14	BH16-5-1
Cadmium	ug/g	-	0.3	BH16-8-1
Chromium	ug/g	-	**170**	BH16-13-1
Cobalt	ug/g	-	**32**	TP16-6-2
Copper	ug/g	-	60	BH16-13-1
Lead	ug/g	-	23	BH16-8-1
Mercury	ug/g	-	<0.05	multiple locations
Molybdenum	ug/g	-	1.3	BH16-5-1
Nickel	ug/g	-	88	BH16-13-1
Selenium	ug/g	-	0.8	BH16-17-2
Silver	ug/g	-	<0.2	multiple locations
Thallium	ug/g	-	0.51	BH16-11-2
Uranium	ug/g	-	2.6	BH16-5-2
Vanadium	ug/g	-	**130**	BH16-11-2
Zinc	ug/g	-	130	multiple locations

Table 9.14
SOIL ANALYTICAL RESULTS - MAXIMUM CONCENTRATIONS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Soil Parameter	Units	MOE Table 6 Standards[3]	Maximum Value	Location of Maximum Value
Chlordane (Total)	ug/g	-	<0.0040	BH16-8-1
o,p-DDD + p,p-DDD	ug/g	-	<0.0040	BH16-8-1
o,p-DDE + p,p-DDE	ug/g	-	<0.0040	BH16-8-1
o,p-DDT + p,p-DDT	ug/g	-	<0.0040	BH16-8-1
Total Endosulfan	ug/g	-	<0.0040	BH16-8-1
Total PCB	ug/g	-	<0.030	BH16-8-1
Aldrin	ug/g	-	<0.0040	BH16-8-1
a-Chlordane	ug/g	-	<0.0040	BH16-8-1
g-Chlordane	ug/g	-	<0.0040	BH16-8-1
o,p-DDD	ug/g	-	<0.0040	BH16-8-1
p,p-DDD	ug/g	-	<0.0040	BH16-8-1
o,p-DDE	ug/g	-	<0.0040	BH16-8-1
p,p-DDE	ug/g	-	<0.0040	BH16-8-1
o,p-DDT	ug/g	-	<0.0040	BH16-8-1
p,p-DDT	ug/g	-	<0.0040	BH16-8-1
Dieldrin	ug/g	-	<0.0040	BH16-8-1
Lindane	ug/g	-	<0.0040	BH16-8-1
Endosulfan I (alpha)	ug/g	-	<0.0040	BH16-8-1
Endosulfan II (beta)	ug/g	-	<0.0040	BH16-8-1
Endrin	ug/g	-	<0.0040	BH16-8-1
Heptachlor	ug/g	-	<0.0040	BH16-8-1
Heptachlor epoxide	ug/g	-	<0.0040	BH16-8-1
Hexachlorobenzene	ug/g	-	<0.0040	BH16-8-1
Hexachlorobutadiene	ug/g	-	<0.010	BH16-8-1
Hexachloroethane	ug/g	-	<0.010	BH16-8-1
Methoxychlor	ug/g	-	<0.010	BH16-8-1
Aroclor 1242	ug/g	-	<0.030	BH16-8-1
Aroclor 1248	ug/g	-	<0.030	BH16-8-1
Aroclor 1254	ug/g	-	<0.030	BH16-8-1
Aroclor 1260	ug/g	-	<0.030	BH16-8-1
Methylnaphthalene, 2-(1-)	ug/g	-	<0.014	multiple locations
Acenaphthene	ug/g	-	<0.0050	multiple locations
Acenaphthylene	ug/g	-	<0.0050	multiple locations
Anthracene	ug/g	-	<0.0050	multiple locations
Benzo(a)anthracene	ug/g	-	0.053	BH16-8-1
Benzo(a)pyrene	ug/g	-	0.057	BH16-8-1
Benzo(b/j)fluoranthene	ug/g	-	0.085	BH16-8-1
Benzo(g,h,i)perylene	ug/g	-	0.035	BH16-8-1
Benzo(k)fluoranthene	ug/g	-	0.024	BH16-8-1
Chrysene	ug/g	-	0.057	BH16-8-1
Dibenz(a,h)anthracene	ug/g	-	0.0086	BH16-8-1
Fluoranthene	ug/g	-	0.11	BH16-8-1
Fluorene	ug/g	-	<0.0050	multiple locations
Indeno(1,2,3-cd)pyrene	ug/g	-	0.035	BH16-8-1
1-Methylnaphthalene	ug/g	-	<0.0050	multiple locations
2-Methylnaphthalene	ug/g	-	<0.0050	multiple locations
Naphthalene	ug/g	-	<0.0050	multiple locations
Phenanthrene	ug/g	-	0.022	BH16-17-1
Pyrene	ug/g	-	0.089	BH16-8-1
Fraction of Organic Carbon	g/g	-	0.012	BH16-13-1
Fraction of Organic Carbon (rep.#1)	g/g	-	0.01	multiple locations
Fraction of Organic Carbon (rep.#2)	g/g	-	0.014	BH16-9-1
Average FOC Result	g/g	-	0.012	BH16-9-1
Total Organic Carbon	mg/kg	-	12000	BH16-13-1
Total Organic Carbon (repeat #1)	mg/kg	-	11000	multiple locations
Total Organic Carbon (repeat #2)	mg/kg	-	14000	BH16-9-1

Notes:

[3] Ministry of the Environment and Cliamte Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

na Not Applicable
- Not compared to MOE SCS
< #### Concentration less than laboratory RDL or adjusted RDL
<u>< ####</u> Adjusted RDL exceeds the selected MOECC SCS
<u>VALUE</u> **<u>BOLD and UNDERLINED</u>** Value Exceeds MOECC SCS

Table 9.15
GROUND WATER ANALYTICAL RESULTS - MAXIMUM CONCENTRATIONS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Groundwater Parameter	Units	MOE Table 6 Standards[3]	Maximum Value	Location of Maximum Value
1,3-Dichloropropene (cis+trans)	ug/L	0.5	<0.50	multiple locations
Acetone (2-Propanone)	ug/L	2700	<10	multiple locations
Benzene	ug/L	0.5	<0.20	multiple locations
Bromodichloromethane	ug/L	16	<0.50	multiple locations
Bromoform	ug/L	5	<1.0	multiple locations
Bromomethane	ug/L	0.89	<0.50	multiple locations
Carbon Tetrachloride	ug/L	0.2	<0.20	multiple locations
Chlorobenzene	ug/L	30	<0.20	multiple locations
Chloroform	ug/L	2	<0.20	multiple locations
Dibromochloromethane	ug/L	25	<0.50	multiple locations
1,2-Dichlorobenzene	ug/L	3	<0.50	multiple locations
1,3-Dichlorobenzene	ug/L	59	<0.50	multiple locations
1,4-Dichlorobenzene	ug/L	0.5	<0.50	multiple locations
Dichlorodifluoromethane (FREON 12)	ug/L	590	<1.0	multiple locations
1,1-Dichloroethane	ug/L	5	<0.20	multiple locations
1,2-Dichloroethane	ug/L	0.5	<0.50	multiple locations
1,1-Dichloroethylene	ug/L	0.5	<0.20	multiple locations
cis-1,2-Dichloroethylene	ug/L	1.6	<0.50	multiple locations
trans-1,2-Dichloroethylene	ug/L	1.6	<0.50	multiple locations
1,2-Dichloropropane	ug/L	0.58	<0.20	multiple locations
cis-1,3-Dichloropropene	ug/L	na	<0.30	multiple locations
trans-1,3-Dichloropropene	ug/L	na	<0.40	multiple locations
Ethylbenzene	ug/L	2.4	<0.20	multiple locations
Ethylene Dibromide	ug/L	0.2	<0.20	multiple locations
Hexane	ug/L	5	<1.0	multiple locations
Methylene Chloride (Dichloromethane)	ug/L	26	<2.0	multiple locations
Methyl Ethyl Ketone (2-Butanone)	ug/L	1800	<10	multiple locations
Methyl Isobutyl Ketone	ug/L	640	<5.0	multiple locations
Methyl t-butyl ether (MTBE)	ug/L	15	<0.50	multiple locations
Styrene	ug/L	5.4	<0.50	multiple locations
1,1,1,2-Tetrachloroethane	ug/L	1.1	<0.50	multiple locations
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.50	multiple locations
Tetrachloroethylene	ug/L	0.5	<0.20	multiple locations
Toluene	ug/L	24	0.77	MW16-4
1,1,1-Trichloroethane	ug/L	23	<0.20	multiple locations
1,1,2-Trichloroethane	ug/L	0.5	<0.50	multiple locations
Trichloroethylene	ug/L	0.5	<0.20	multiple locations
Trichlorofluoromethane (FREON 11)	ug/L	150	<0.50	multiple locations
Vinyl Chloride	ug/L	0.5	<0.20	multiple locations
p+m-Xylene	ug/L	na	0.32	MW16-4
o-Xylene	ug/L	na	<0.20	multiple locations
Total Xylenes	ug/L	72	<0.4	MW16-4
F1 (C6-C10)	ug/L	420	<25	multiple locations
F1 (C6-C10) - BTEX	ug/L	420	<25	multiple locations
F2 (C10-C16 Hydrocarbons)	ug/L	150	<100	multiple locations
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	multiple locations
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	multiple locations
Free Cyanide	ug/L	-	<2	multiple locations
Chloride	mg/L	-	**1100**	MW16-4
Phenols	mg/L	-	<0.0010	multiple locations
pH	na	-	7.91	MW16-5
Chromium (VI)	ug/L	-	<0.50	multiple locations
Mercury	ug/L	-	<0.1	multiple locations
Antimony	ug/L	-	<0.50	multiple locations
Arsenic	ug/L	-	1	MW16-5
Barium	ug/L	-	140	MW16-4
Beryllium	ug/L	-	<0.50	multiple locations
Boron	ug/L	-	66	MW16-3
Cadmium	ug/L	-	<0.10	multiple locations
Chromium	ug/L	-	<5.0	multiple locations
Cobalt	ug/L	-	1.8	MW16-2
Copper	ug/L	-	2.3	MW16-5
Lead	ug/L	-	0.77	MW16-2
Molybdenum	ug/L	-	13	MW16-5
Nickel	ug/L	-	5.4	MW16-3
Selenium	ug/L	-	<2.0	multiple locations
Silver	ug/L	-	<0.10	multiple locations
Sodium	ug/L	-	410000	MW16-4
Thallium	ug/L	-	0.058	MW16-3
Uranium	ug/L	-	**47**	MW17-1
Vanadium	ug/L	-	3.2	MW16-2
Zinc	ug/L	-	<5.0	multiple locations

Table 9.15
GROUND WATER ANALYTICAL RESULTS - MAXIMUM CONCENTRATIONS
FirstGroup America
1830 Trim Road
Orleans, Ontario

Groundwater Parameter	Units	MOE Table 6 Standards[3]	Maximum Value	Location of Maximum Value
Chlordane (Total)	ug/L	-	<0.005	MW16-1
o,p-DDD + p,p-DDD	ug/L	-	<0.005	MW16-1
o,p-DDE + p,p-DDE	ug/L	-	<0.005	MW16-1
o,p-DDT + p,p-DDT	ug/L	-	<0.005	MW16-1
Total Endosulfan	ug/L	-	<0.005	MW16-1
Total PCB	ug/L	-	<0.05	MW16-1
Aldrin	ug/L	-	<0.005	MW16-1
Dieldrin	ug/L	-	<0.005	MW16-1
a-Chlordane	ug/L	-	<0.005	MW16-1
g-Chlordane	ug/L	-	<0.005	MW16-1
o,p-DDD	ug/L	-	<0.005	MW16-1
p,p-DDD	ug/L	-	<0.005	MW16-1
o,p-DDE	ug/L	-	<0.005	MW16-1
p,p-DDE	ug/L	-	<0.005	MW16-1
o,p-DDT	ug/L	-	<0.005	MW16-1
p,p-DDT	ug/L	-	<0.005	MW16-1
Lindane	ug/L	-	<0.003	MW16-1
Endosulfan I (alpha)	ug/L	-	<0.005	MW16-1
Endosulfan II (beta)	ug/L	-	<0.005	MW16-1
Endrin	ug/L	-	<0.005	MW16-1
Heptachlor	ug/L	-	<0.005	MW16-1
Heptachlor epoxide	ug/L	-	<0.005	MW16-1
Hexachlorobenzene	ug/L	-	<0.005	MW16-1
Hexachlorobutadiene	ug/L	-	<0.009	MW16-1
Hexachloroethane	ug/L	-	<0.01	MW16-1
Methoxychlor	ug/L	-	<0.01	MW16-1
Aroclor 1242	ug/L	-	<0.05	MW16-1
Aroclor 1248	ug/L	-	<0.05	MW16-1
Aroclor 1254	ug/L	-	<0.05	MW16-1
Aroclor 1260	ug/L	-	<0.05	MW16-1
Methylnaphthalene, 2-(1-)	ug/L	-	<0.071	multiple locations
Biphenyl	ug/L	-	<0.050	multiple locations
Acenaphthene	ug/L	-	<0.050	multiple locations
Acenaphthylene	ug/L	-	<0.050	multiple locations
Anthracene	ug/L	-	<0.050	multiple locations
Benzo(a)anthracene	ug/L	-	<0.050	multiple locations
Benzo(a)pyrene	ug/L	-	<0.010	multiple locations
Benzo(b/j)fluoranthene	ug/L	-	<0.050	multiple locations
Benzo(g,h,i)perylene	ug/L	-	<0.050	multiple locations
Benzo(k)fluoranthene	ug/L	-	<0.050	multiple locations
Chrysene	ug/L	-	<0.050	multiple locations
Dibenz(a,h)anthracene	ug/L	-	<0.050	multiple locations
Fluoranthene	ug/L	-	<0.050	multiple locations
Fluorene	ug/L	-	<0.050	multiple locations
Indeno(1,2,3-cd)pyrene	ug/L	-	<0.050	multiple locations
1-Methylnaphthalene	ug/L	-	<0.050	multiple locations
2-Methylnaphthalene	ug/L	-	<0.050	multiple locations
Naphthalene	ug/L	-	0.063	MW16-5
Phenanthrene	ug/L	-	0.031	MW16-5
Pyrene	ug/L	-	<0.050	multiple locations

Notes:

[3] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 6: Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Fine Textured Soils and All Types of Property Use

na Not Applicable

- Not compared to MOE SCS

< #### Concentration less than laboratory RDL or adjusted RDL

VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS

FIGURES

LEGEND

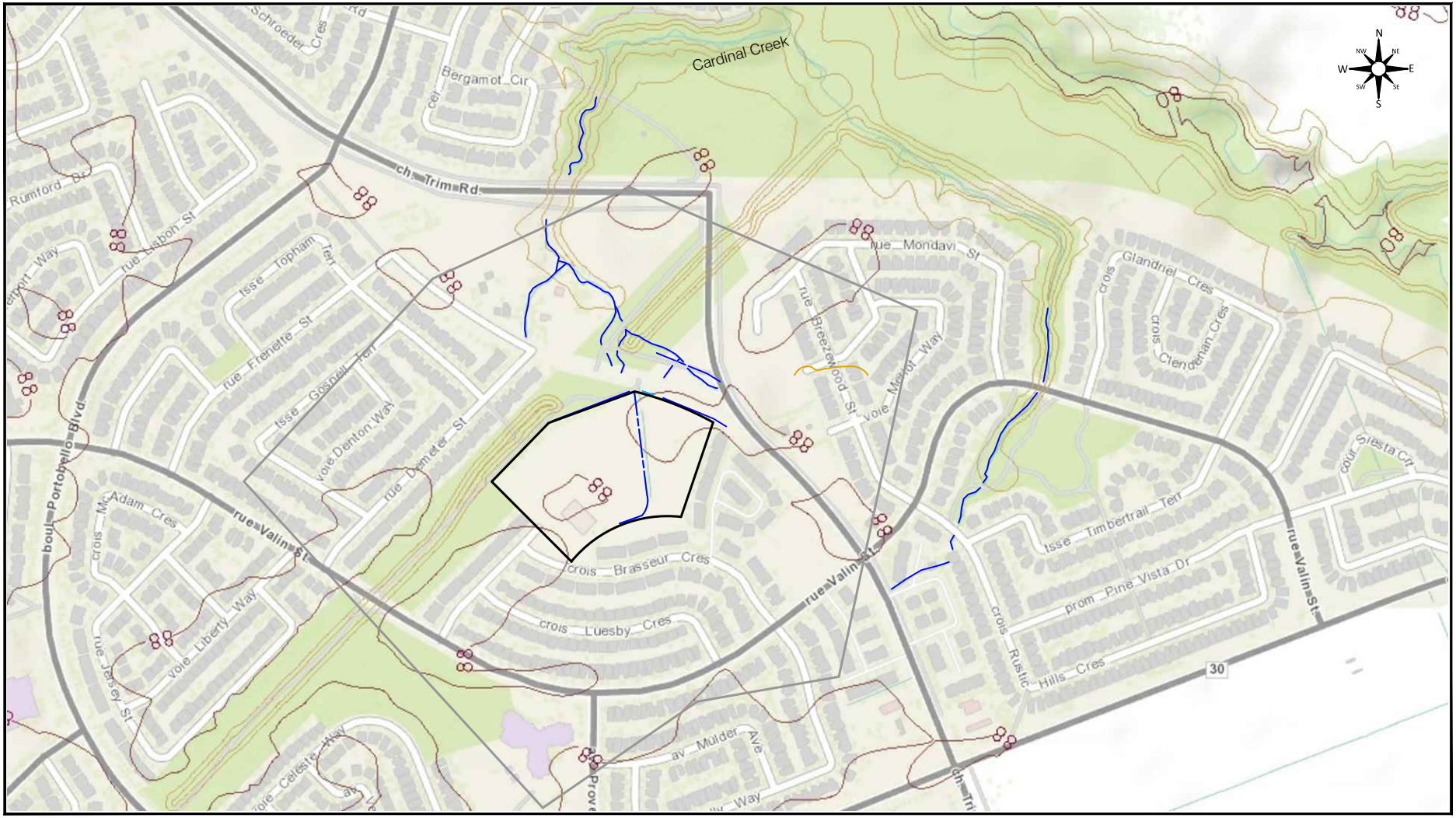
Site Property Line

Phase One Study Area

Title: **KEY PLAN**	
ARCADIS	Project: **ENVIRONMENTAL RISK ASSESSMENT** **1830 TRIM ROAD, OTTAWA, ONTARIO**
Date: **OCTOBER 2018**	Client: **FirstGroup America Inc.**
Metres 250 0 250 500 1:18000	**FIGURE 1**

last saved 16-Nov-18 by dlogan

G:\Projects\2016\450271-000 1830 Trim Road\All Figures\1-CAD\NOVEMBER2018\SUBMITTED\450271-000 Trim Road_RA.dwg



LEGEND

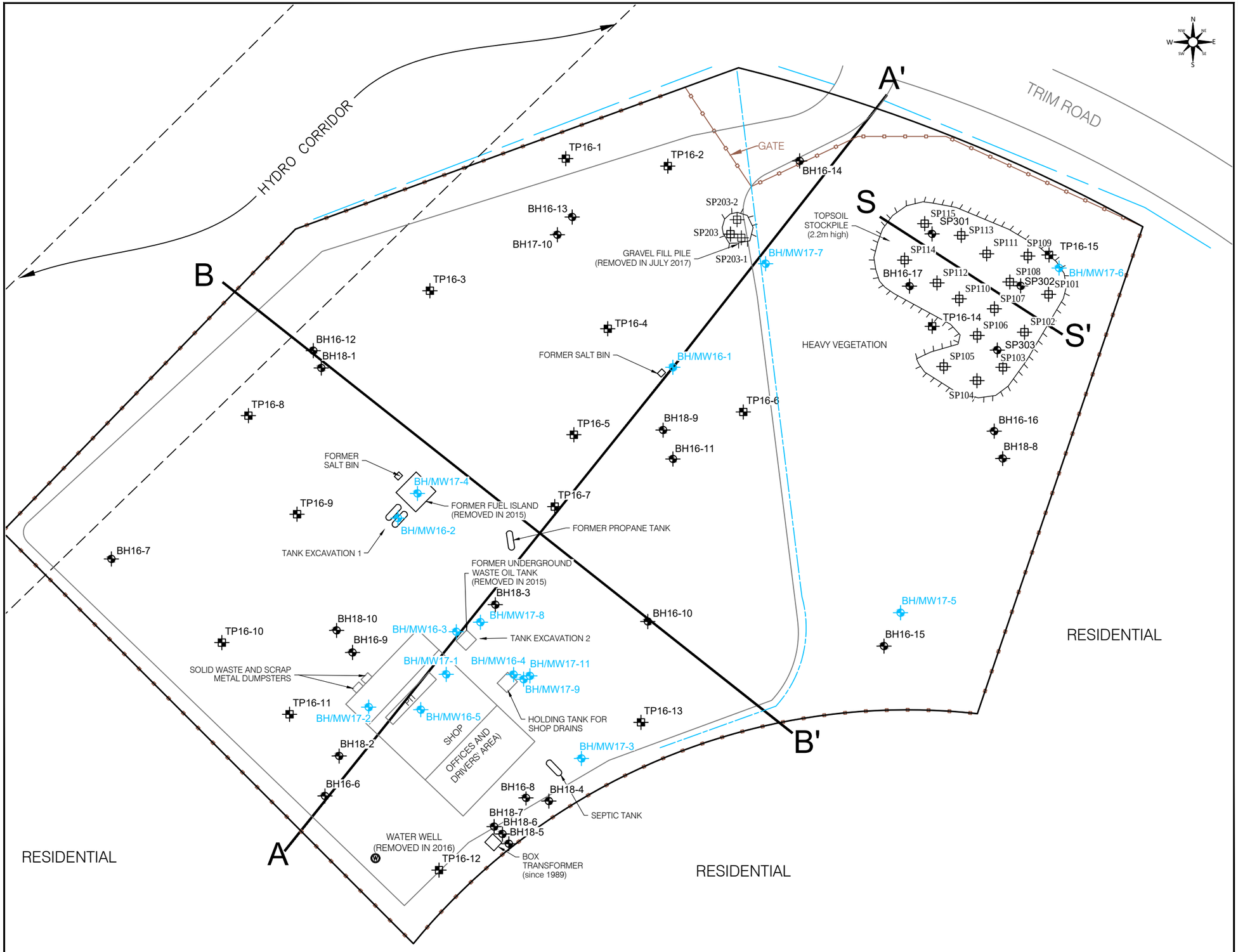
- Site Property Line/Phase One Study Area
- Phase One Study Area
- Topographic Contours - Major
- Topographic Contours - Minor
- Surface Water Bodies
- Ephemeral Streams

Note: No areas of natural significance found within 250m of subject property boundaries.

Title: **TOPOGRAPHY AND SURFACE WATER**	
ARCADIS	Project: **ENVIRONMENTAL RISK ASSESSMENT** **1830 TRIM ROAD, OTTAWA, ONTARIO**
Date: **OCTOBER 2018**	Client: **FirstGroup America Inc.**
Metres 100 0 100 200 1:8000	**FIGURE 2**

last saved 16-Nov-18 by dlogan

G:\Projects\2016\450271-000 1830 Trim Road\All Figures\1-CAD\NOVEMBER2018\SUBMITTED\450271-000 Trim Road_RA.dwg



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- BH/MW17-1 — Monitoring Well (May & Aug. 2017)
- BH17-10 — Borehole (May 2017)
- TP16-1 — Test Pit (May 2016)
- SP203 — Stockpile Test Pit (May 2016)
- BH/MW16-1 — Monitoring Well (Feb. 2016)
- BH16-6 — Borehole (Feb. 2016)
- BH18-1 to 7 — Borehole (Mar. 2018)
- BH18-8 to 10 — Borehole (July 2018)
- SP301 — Stockpile Test Pit (Mar. 2018)

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title:
SITE PLAN
TEST PIT/BOREHOLE/MONITORING WELL LOCATIONS

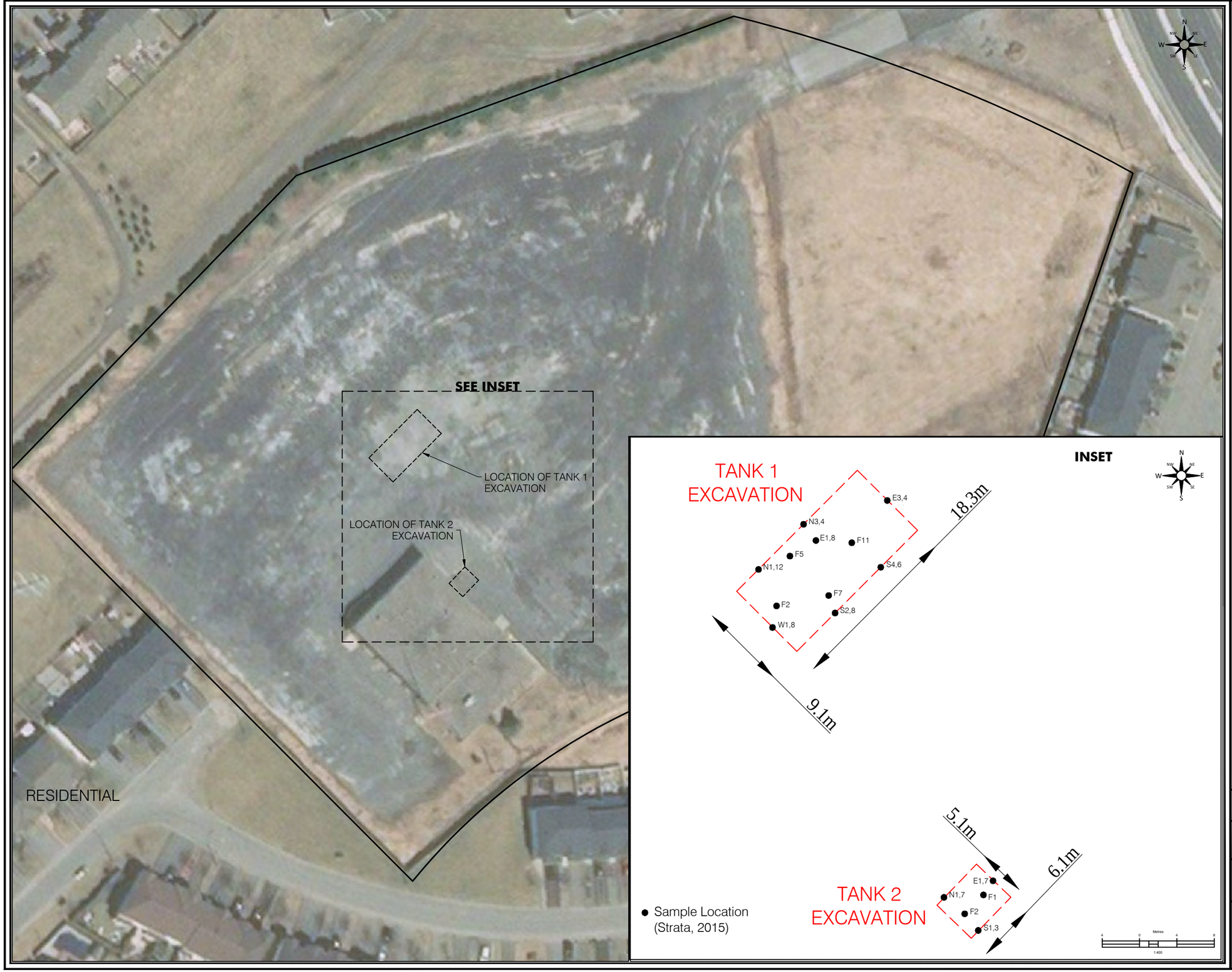
Project:
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2018

FIGURE 3



LEGEND

Site Property Line

Excavation Boundary

NOTE:

July 2015 Confirmatory Sampling

Tank 1: 2 x 45,500 L Diesel USTs
4 floor samples, 7 sidewall samples

Tank 2: 2,270 L Waste Oil UST
2 floor samples, 3 sidewall samples

Overall depths of excavation:

Tank 1 Excavation: West half= to 4.3m depth;
East half to 2.1m depth

Tank 2 Excavation: to 2.4m depth

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres
10 0 10 20
1:1000

Title: **LOCATION OF EXCAVATIONS**

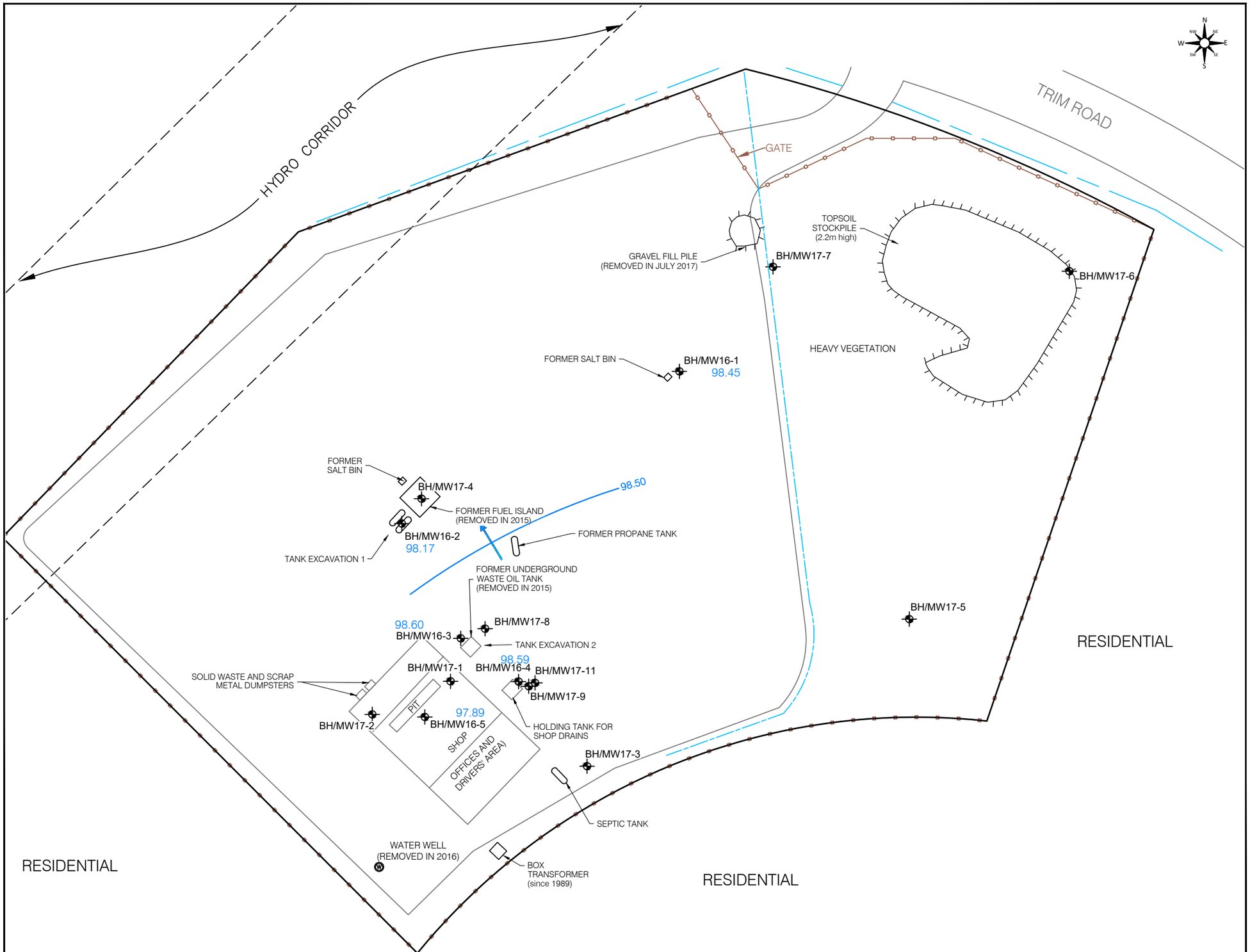
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 4



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Monitoring Well Locations
- 98.55 Groundwater Elevation (Feb. 2016)
- Groundwater Contours
- Inferred Groundwater Direction Flow

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER CONTOURS (FEB. 2016)**

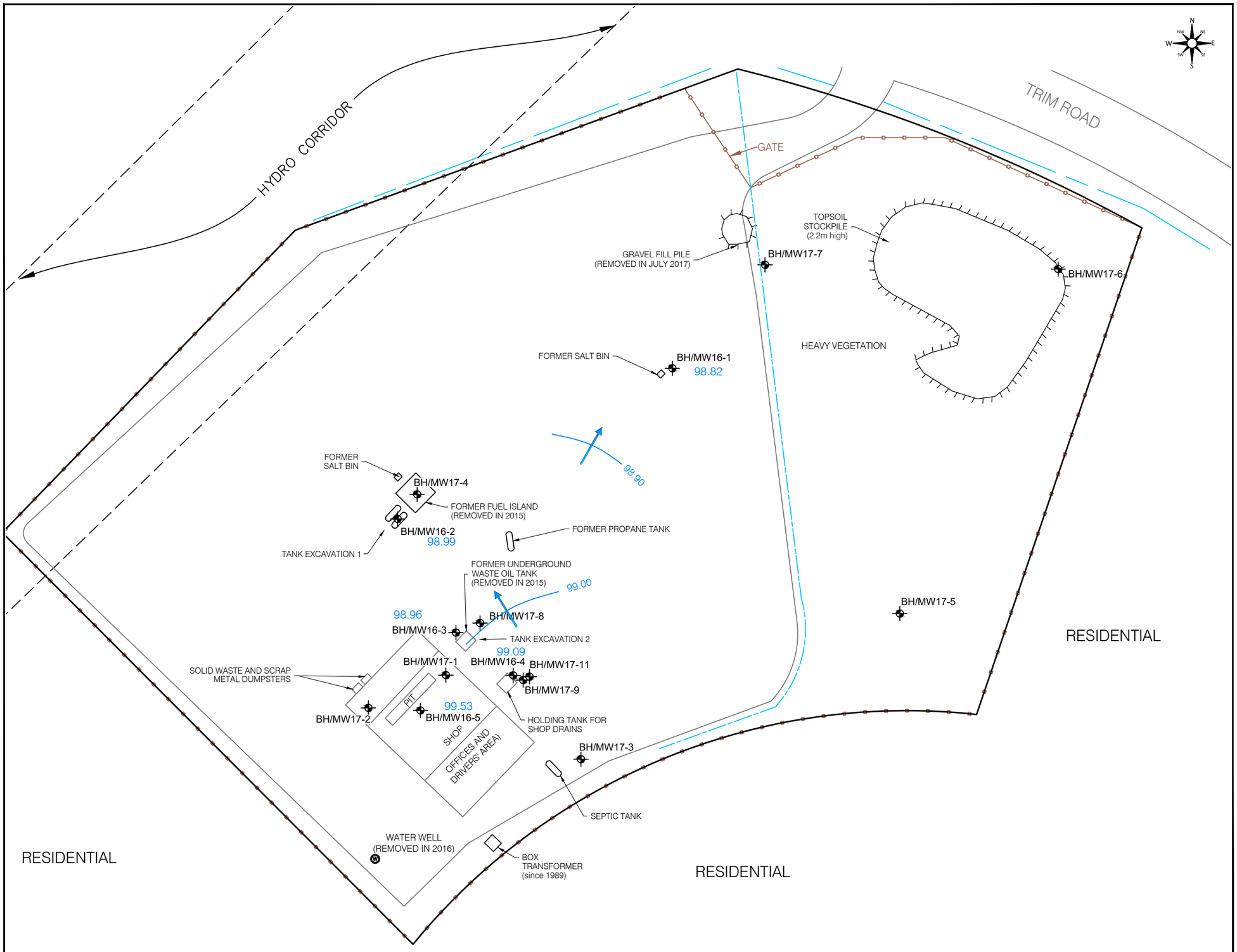
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 5a



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Monitoring Well Locations
- 98.55 Groundwater Elevation (Feb. 2016)
- Groundwater Contours
- Inferred Groundwater Direction Flow

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres 10 0 10 20 1:1000

Title: **GROUNDWATER CONTOURS (MAY 2016)**

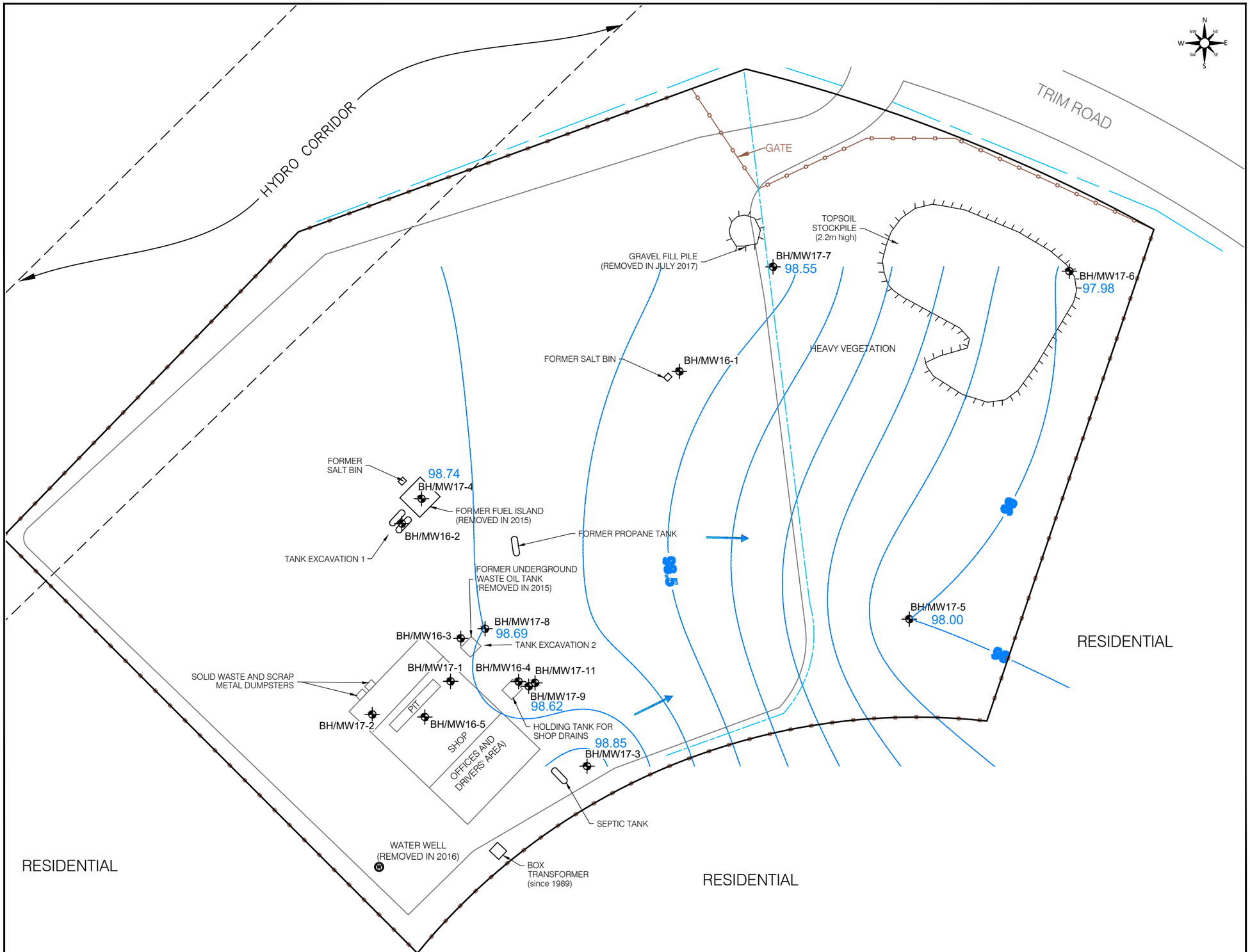
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 5b



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Monitoring Well Locations
- 98.55 — Groundwater Elevation (Sept. 2017)
- Groundwater Contours
- Inferred Groundwater Direction Flow

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER CONTOURS (SEPT. 2017)**

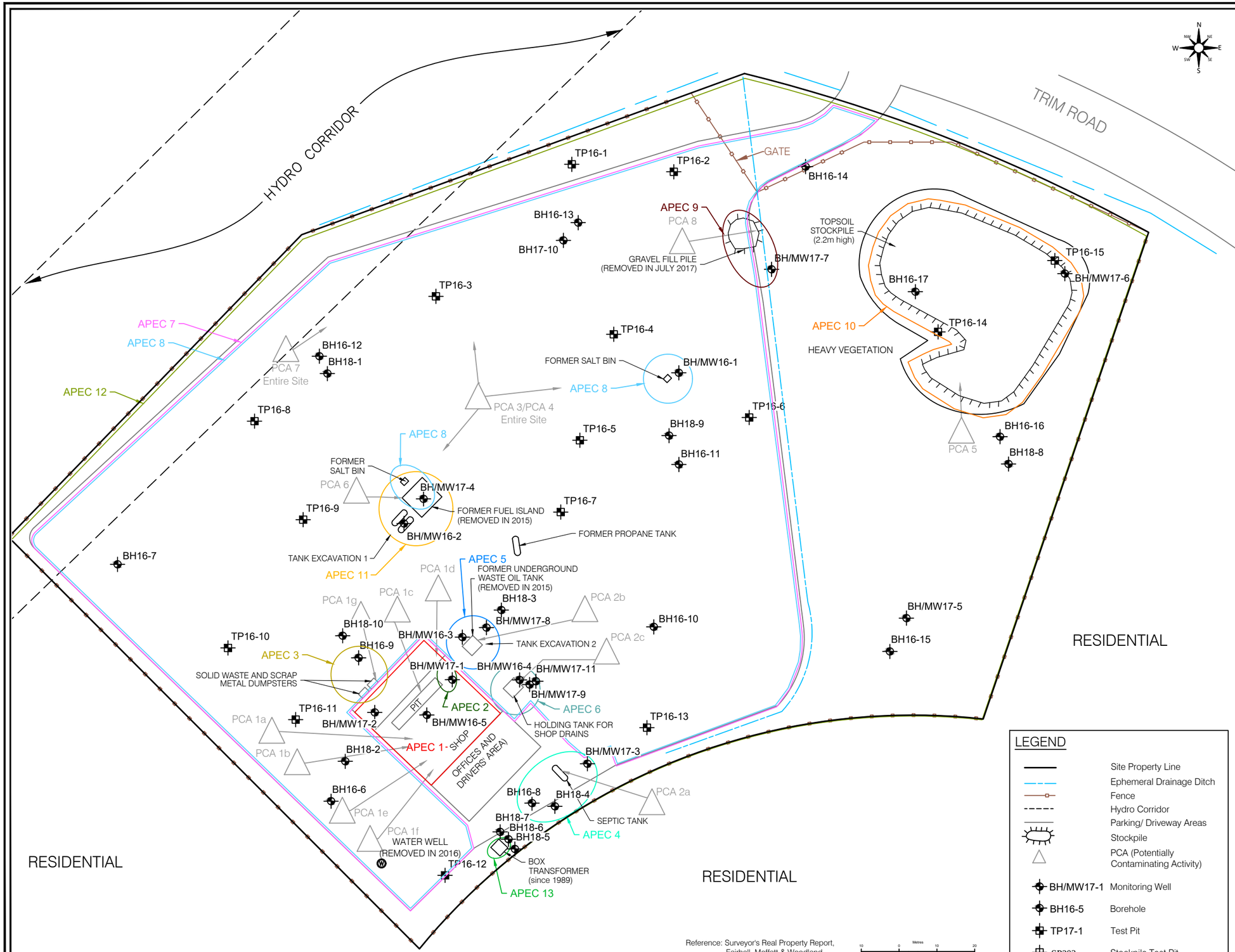
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 5c



PCA 1 - Operation of bus maintenance garage; including
(a) the use of lubricants, motor oils, grease and gear oils,
(b) production of waste oils,
(c) the use of antifreeze and bus windshield wash fluid,
(d) the use of solvents for parts de-greasing,
(e) the use of maintenance tools which may generate metal grindings/ welding fumes,
(f) replacement of vehicle tires, and
(g) the presence of solid waste bins and scrap metal dumpsters.

PCA 2 - Bus maintenance garage services, including
(a) septic field and tank,
(b) underground waste oil tank and
(c) shop drains sanitary underground holding tank.

PCA 3 - Placement of gravel fill of unknown origin across the site for purposes of the bus parking area.

PCA 4 - Maintenance of the gravel parking lot- including use of salt.

PCA 5 - Presence of the stockpile of excess topsoil fill at northeast corner of property.

PCA 6 - Former diesel underground storage tanks (USTs) present in yard to the north of the maintenance garage building.

PCA 7 - Potential for pesticide use with former agricultural operations.

PCA 8 - Presence of the former stockpile of excess gravel fill near the entrance.

APEC 1 - The bus maintenance garage area from multiple contamination sources including the use of lubricants, motor oils, grease and gear oils, production of waste oils, antifreeze and bus windshield wash fluid, maintenance tools which may generate metal grindings/welding fumes and replacement of vehicle tires.

APEC 2 - The bus maintenance garage area from multiple contamination sources including the use of solvents for parts de-greasing.

APEC 3 - The bus maintenance garage area from multiple contamination sources including the presence of solid waste bins and scrap metal dumpsters.

APEC 4 - The exterior bus service areas and parking lot due to the presence of a septic tank.

APEC 5 - The exterior bus service areas and parking lot due to the presence of an underground waste oil tank.

APEC 6 - The exterior bus service areas and parking lot due to the presence of the shop drain/sanitary underground holding tank.

APEC 7 - The bus parking area due to the placement of gravel fill of unknown origin across the site.

APEC 8 - The gravel parking lot due to parking lot maintenance, potentially including use and storage of salt.

APEC 9 - The stockpile of excess gravel fill near the entrance of the property.

APEC 10 - The stockpile of excess fill in the northeast corner of property.

APEC 11 - The area of the former diesel underground storage tanks present in the yard, north of the maintenance garage building.

APEC 12 - The parking lot and grassed areas throughout the property, specifically from potential use of pesticides during historical agricultural operations.

APEC 13 - Box transformer.

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- PCA (Potentially Contaminating Activity)
- BH/MW17-1 Monitoring Well
- BH16-5 Borehole
- TP17-1 Test Pit
- SP203 Stockpile Test Pit

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **LOCATION OF PCAs/APECs**

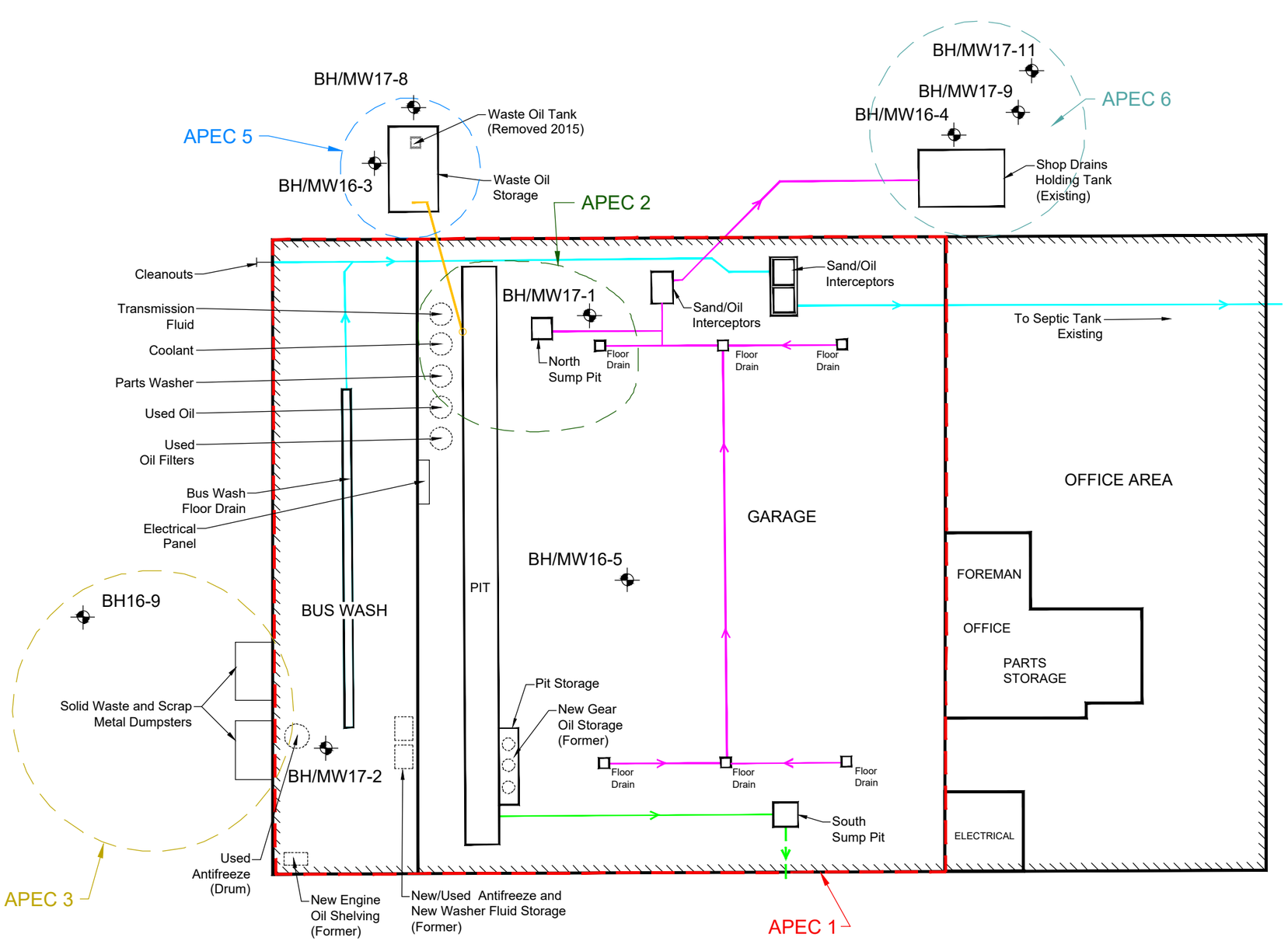
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 6a



Metres

4 0 4 8

1:200

LEGEND

- BH/MW17-1 — Borehole/Monitoring Well
- Waste Oil Buried Drain Line
- Pit Flooding Buried Drain Line
- Floor Drains Buried Line
- Bus Wash Buried Drain Line

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

APEC 1 - The bus maintenance garage area from multiple contamination sources including the use of lubricants, motor oils, grease and gear oils, production of waste oils, antifreeze and bus windshield wash fluid, maintenance tools which may generate metal grindings/welding fumes and replacement of vehicle tires.

APEC 2 - The bus maintenance garage area from multiple contamination sources including the use of solvents for parts de-greasing.

APEC 3 - The bus maintenance garage area from multiple contamination sources including the presence of solid waste bins and scrap metal dumpsters.

APEC 5 - The exterior bus service areas and parking lot due to the presence of an underground waste oil tank.

APEC 6 - The exterior bus service areas and parking lot due to the presence of the shop drain/sanitary underground holding tank.

NOTE

All materials storage areas are former. Building is vacant and empty at current time.

BUILDING DETAILS

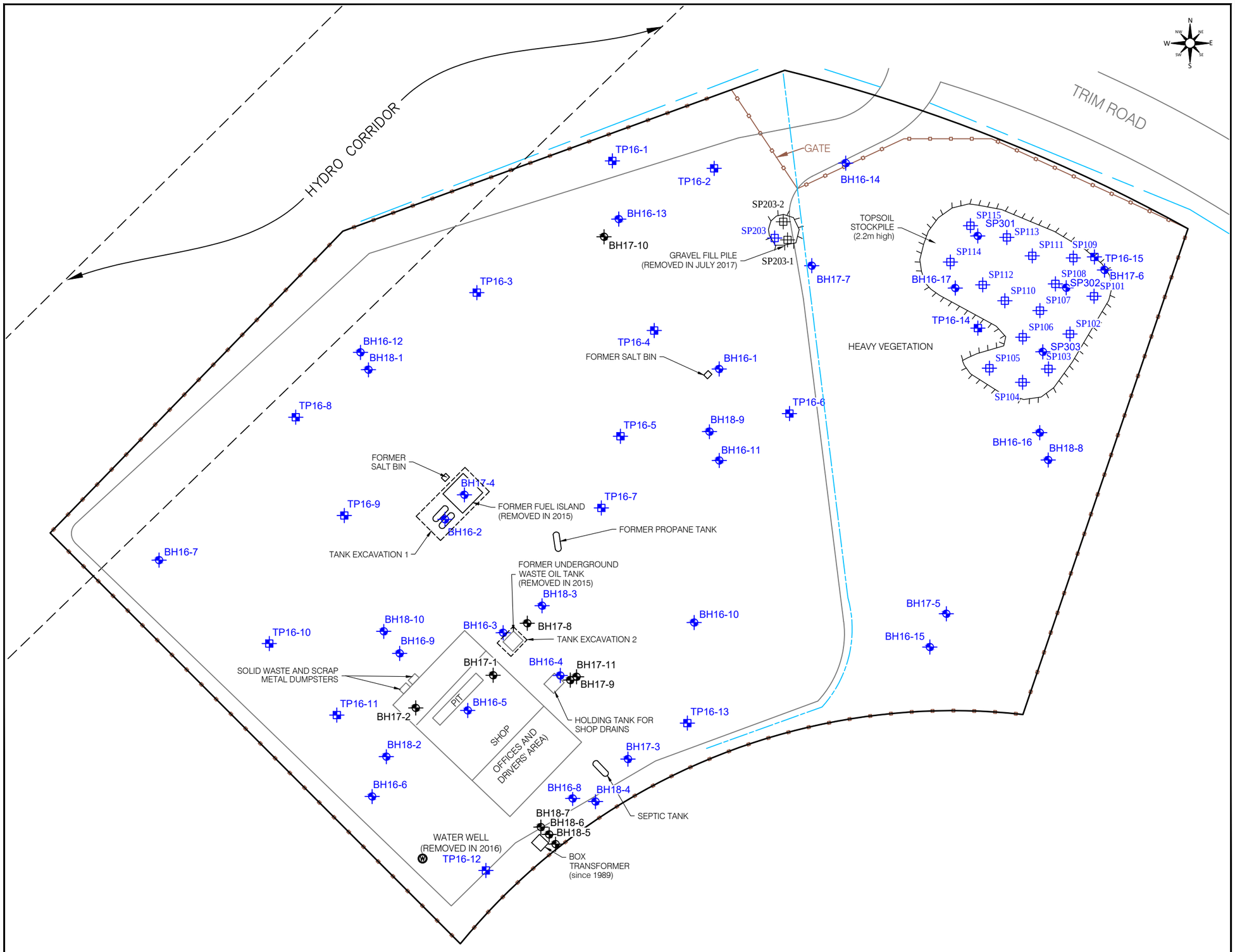
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

FirstGroup America Inc.

ARCADIS

OCTOBER 2018

FIGURE 6b



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sampled Borehole/Test Pit Location
- Borehole/Test Pit Not Sampled

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title:
SAMPLING LOCATIONS FOR INORGANICS IN SOIL

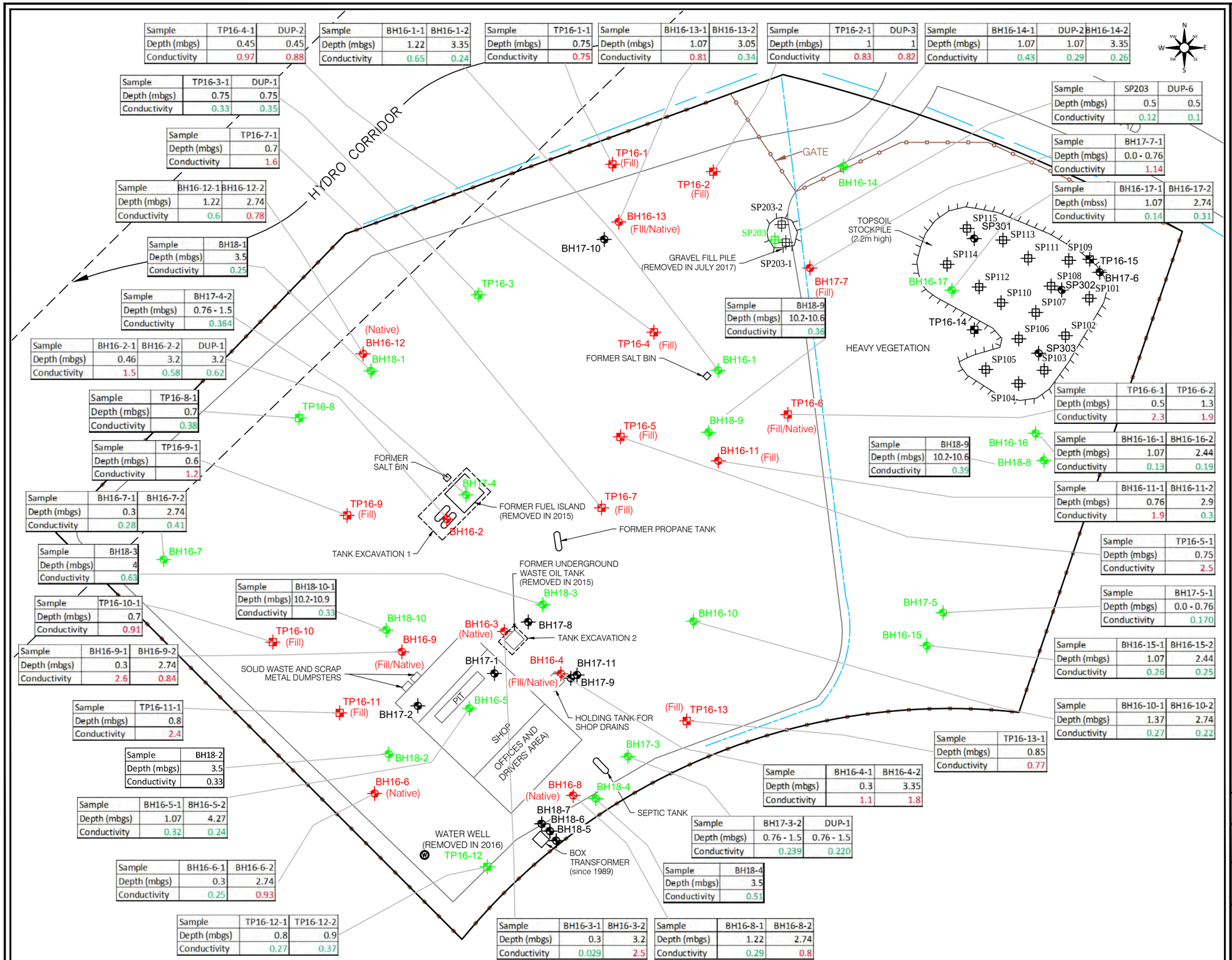
Project:
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2018

FIGURE 7



Sample	TP16-4-1	DUP-2
Depth (mbgs)	0.45	0.45
Conductivity	0.97	0.88

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Conductivity	0.65	0.24

Sample	TP16-1-1
Depth (mbgs)	0.75
Conductivity	0.75

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Conductivity	0.81	0.34

Sample	TP16-2-1	DUP-3
Depth (mbgs)	1	1
Conductivity	0.83	0.82

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Conductivity	0.43	0.29	0.26

Sample	TP16-3-1	DUP-1
Depth (mbgs)	0.75	0.75
Conductivity	0.33	0.35

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
Conductivity	0.12	0.1

Sample	TP16-7-1
Depth (mbgs)	0.7
Conductivity	1.6

Sample	BH17-7-1
Depth (mbgs)	0.0 - 0.76
Conductivity	1.14

Sample	BH16-12-1	BH16-12-2
Depth (mbgs)	1.22	2.74
Conductivity	0.6	0.78

Sample	BH16-17-1	BH16-17-2
Depth (mbss)	1.07	2.74
Conductivity	0.14	0.31

Sample	BH18-1
Depth (mbgs)	3.5
Conductivity	0.25

Sample	BH17-4-2
Depth (mbgs)	0.76 - 1.5
Conductivity	0.364

Sample	BH18-9
Depth (mbgs)	10.2-10.6
Conductivity	0.36

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.2
Conductivity	1.5	0.58	0.62

Sample	TP16-8-1
Depth (mbgs)	0.7
Conductivity	0.38

Sample	TP16-6-1	TP16-6-2
Depth (mbgs)	0.5	1.3
Conductivity	2.3	1.9

Sample	TP16-9-1
Depth (mbgs)	0.6
Conductivity	1.2

Sample	BH18-9
Depth (mbgs)	10.2-10.6
Conductivity	0.39

Sample	BH16-16-1	BH16-16-2
Depth (mbgs)	1.07	2.44
Conductivity	0.13	0.19

Sample	BH16-7-1	BH16-7-2
Depth (mbgs)	0.3	2.74
Conductivity	0.28	0.41

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Conductivity	1.9	0.3

Sample	BH18-3
Depth (mbgs)	4
Conductivity	0.63

Sample	TP16-5-1
Depth (mbgs)	0.75
Conductivity	2.5

Sample	TP16-10-1
Depth (mbgs)	0.7
Conductivity	0.91

Sample	BH17-5-1
Depth (mbgs)	0.0 - 0.76
Conductivity	0.170

Sample	BH18-10-1
Depth (mbgs)	10.2-10.9
Conductivity	0.33

Sample	BH16-9-1	BH16-9-2
Depth (mbgs)	0.3	2.74
Conductivity	2.6	0.84

Sample	BH16-15-1	BH16-15-2
Depth (mbgs)	1.07	2.44
Conductivity	0.26	0.25

Sample	TP16-11-1
Depth (mbgs)	0.8
Conductivity	2.4

Sample	BH16-10-1	BH16-10-2
Depth (mbgs)	1.37	2.74
Conductivity	0.27	0.22

Sample	TP16-13-1
Depth (mbgs)	0.85
Conductivity	0.77

Sample	BH18-2
Depth (mbgs)	3.5
Conductivity	0.33

Sample	BH16-4-1	BH16-4-2
Depth (mbgs)	0.3	3.35
Conductivity	1.1	1.8

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Conductivity	0.32	0.24

Sample	BH17-3-2	DUP-1
Depth (mbgs)	0.76 - 1.5	0.76 - 1.5
Conductivity	0.239	0.220

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Conductivity	0.25	0.93

Sample	BH18-4
Depth (mbgs)	3.5
Conductivity	0.51

Sample	TP16-12-1	TP16-12-2
Depth (mbgs)	0.8	0.9
Conductivity	0.27	0.37

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Conductivity	0.029	2.5

Sample	BH16-8-1	BH16-8-2
Depth (mbgs)	1.22	2.74
Conductivity	0.29	0.8

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Electrical Conductivity
- Sample Exceeds the Applicable SCS for Electrical Conductivity
- Borehole/Test Pit Not Sampled

NOTE:

Electrical Conductivity Soil Standard not Applicable at depth >1.5 mbgs

Parameter	MOECC Table 6 Site Condition Standard
Conductivity	0.7

Units: mS/cm

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres 10 0 10 20 1:1000

Title:
SOIL SAMPLING PLAN
CONTAMINANT DISTRIBUTION PLAN - CONDUCTIVITY

Project:
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2018

FIGURE 8

Large Stockpile	SP101	SP102	SP103	SP104	SP105	SP106	DUP-4	SP107	SP108	SP109	SP110	SP111	SP112	DUP-5	SP113	SP114	SP115	SP301	SP302	SP303
Depth (mbgs)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	3.8	4.0	4.0
Free Cyanide	0.07	0.07	0.07	0.06	0.05	0.04	0.05	0.06	0.07	0.04	0.06	0.04	0.06	0.05	0.07	0.07	0.06	<0.01	<0.01	<0.01

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Free Cyanide	0.03	<0.01

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
Free Cyanide	<0.01	<0.01

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Free Cyanide	<0.01	<0.01	<0.01

Sample	BH16-17-1	BH16-17-2
Depth (mbss)	1.07	2.74
Free Cyanide	0.1	0.28

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Free Cyanide	0.01	0.02

Sample	TP16-15-1
Depth (mbgs)	1.2
Free Cyanide	<0.01

Sample	TP16-4-1	DUP-2
Depth (mbgs)	0.45	0.45
Free Cyanide	<0.01	<0.01

Sample	BH16-12-1	BH16-12-2
Depth (mbgs)	1.22	2.74
Free Cyanide	<0.01	<0.01

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.35
Free Cyanide	<0.01	0.02	0.02

Sample	BH16-7-1	BH16-7-2
Depth (mbgs)	0.3	2.74
Free Cyanide	<0.01	<0.01

Sample	BH17-6-1
Depth (mbgs)	0 - 0.76
Cyanide	<0.01

Sample	BH16-16-1	BH16-16-2
Depth (mbgs)	1.07	2.44
Free Cyanide	0.02	0.02

Sample	BH18-8-1
Depth (mbgs)	10.2-10.6
Free Cyanide	<0.01

Sample	TP16-14-1
Depth (mbgs)	1.2
Free Cyanide	0.05

Sample	TP16-6-2
Depth (mbgs)	1.3
Free Cyanide	<0.01

Sample	BH18-9-1
Depth (mbgs)	10.2-10.6
Free Cyanide	<0.01

Sample	BH18-10-1
Depth (mbgs)	10.2-10.9
Free Cyanide	<0.01

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Free Cyanide	<0.01	<0.01

Sample	BH16-9-1	BH16-9-2
Depth (mbgs)	0.3	2.74
Free Cyanide	<0.01	<0.01

Sample	BH17-5-1	DUP-2
Depth (mbgs)	0 - 0.76	0 - 0.76
Cyanide	<0.01	<0.01

Sample	BH16-15-1	BH16-15-2
Depth (mbgs)	1.07	2.44
Free Cyanide	0.02	0.02

Sample	BH16-10-1	BH16-10-2
Depth (mbgs)	1.07	2.74
Free Cyanide	<0.01	<0.01

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Free Cyanide	<0.01	<0.01

Sample	BH17-3-2	DUP-1
Depth (mbgs)	0.76 - 1.5	0.76 - 1.5
Cyanide	<0.01	<0.01

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Free Cyanide	<0.01	<0.01

Sample	BH16-4-1	BH16-4-2
Depth (mbgs)	0.3	3.35
Free Cyanide	0.01	0.02

Sample	TP16-12-2
Depth (mbgs)	0.9
Free Cyanide	0.01

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Free Cyanide	<0.01	0.02

Sample	BH16-8-1	BH16-8-2
Depth (mbgs)	1.22	2.74
Free Cyanide	0.04	<0.01

TP16-1, TP16-2, TP16-3, TP16-4, TP16-5, TP16-6, TP16-7, TP16-8, TP16-9, TP16-10, TP16-11, TP16-12, TP16-13, TP16-14, TP16-15

BH16-1, BH16-2, BH16-3, BH16-4, BH16-5, BH16-6, BH16-7, BH16-8, BH16-9, BH16-10, BH16-11, BH16-12, BH16-13, BH16-14, BH16-15, BH16-16, BH16-17

BH17-1, BH17-2, BH17-3, BH17-4, BH17-5, BH17-6, BH17-7, BH17-8, BH17-10, BH17-11

BH18-1, BH18-2, BH18-3, BH18-4, BH18-5, BH18-6, BH18-7, BH18-8, BH18-9

SP203-1, SP203-2

GATE

GRAVEL FILL PILE (REMOVED IN JULY 2017)

TOPSOIL STOCKPILE (2.2m high)

HEAVY VEGETATION

FORMER SALT BIN

FORMER SALT BIN

FORMER FUEL ISLAND (REMOVED IN 2015)

FORMER PROPANE TANK

TANK EXCAVATION 1

FORMER UNDERGROUND WASTE OIL TANK (REMOVED IN 2015)

TANK EXCAVATION 2

SOLID WASTE AND SCRAP METAL DUMPSTERS

PIT

SHOP

OFFICES AND DRIVERS' AREA)

HOLDING TANK FOR SHOP DRAINS

SEPTIC TANK

WATER WELL (REMOVED IN 2016)

BOX TRANSFORMER (since 1989)

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Free Cyanide
- Sample Exceeds the Applicable SCS for Free Cyanide
- Borehole/Test Pit Not Sampled

NOTE

Soil exceedances for Cyanide only observed within above-grade topsoil stockpile (Typical Stockpile Height 2.2 m)

mbss - metres below stockpile surface

Parameter	MOECC Table 6 Site Condition Standard
Free Cyanide	0.051

Units: µg/g

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres 10 0 10 20

1:1000

Title: **SOIL SAMPLING PLAN**
CONTAMINANT DISTRIBUTION PLAN - FREE CYANIDE

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Client: **FirstGroup America Inc.**

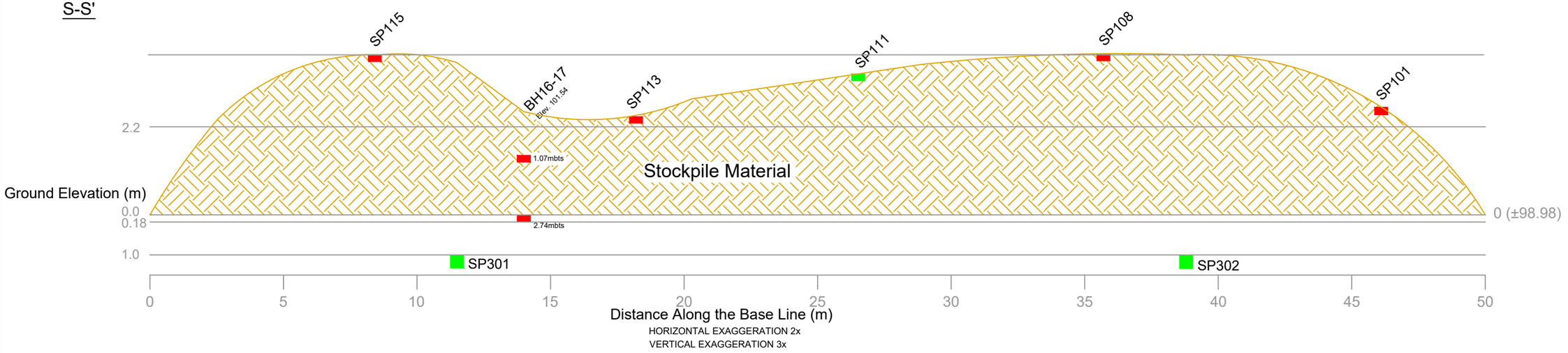
ARCADIS

Date: **OCTOBER 2018**

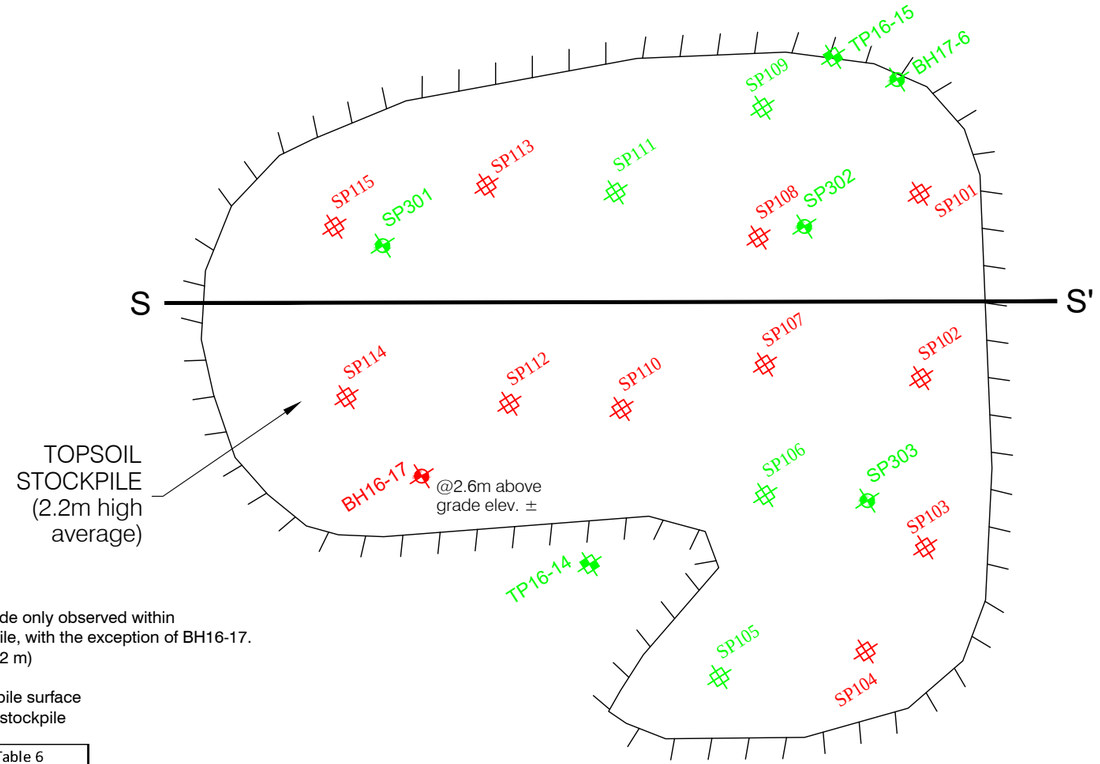
FIGURE 9a

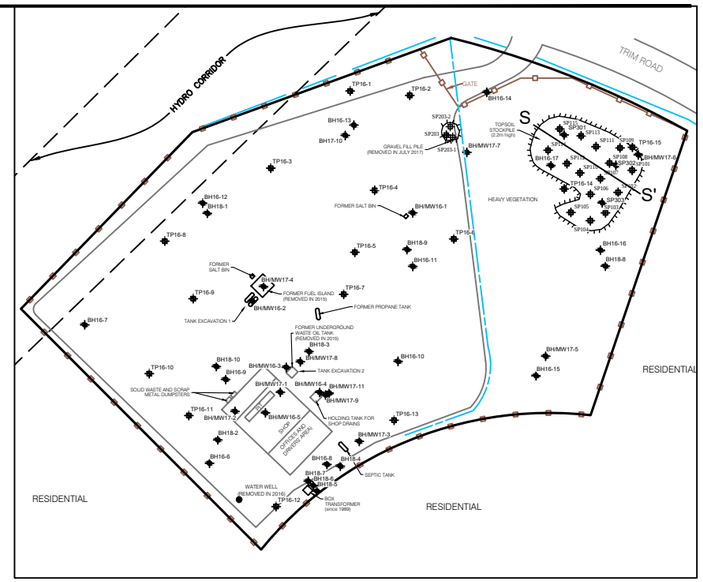
Large Stockpile	SP101	SP102	SP103	SP104	SP105	SP106	DUP-4	SP107	SP108	SP109	SP110	SP111	SP112	DUP-5	SP113	SP114	SP115	BH16-17-1	BH16-17-2	SP301	SP302	SP303
Depth (mbss)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.07	2.74	3.8	4	4
Free Cyanide	0.07	0.07	0.07	0.06	0.05	0.04	0.05	0.06	0.07	0.04	0.06	0.04	0.06	0.05	0.07	0.07	0.06	0.1	0.28	<0.01	<0.01	<0.01

SECTION VIEW
S-S'



PLAN VIEW





NOTE

Soil exceedances for Cyanide only observed within above-grade topsoil stockpile, with the exception of BH16-17. (Typical Stockpile Height 2.2 m)

mbss - metres below stockpile surface
mbts - metres below top of stockpile

Parameter	MOECC Table 6 Site Condition Standard
Free Cyanide	0.051

Units: µg/g

Title: **CROSS SECTION S-S' - FREE CYANIDE**

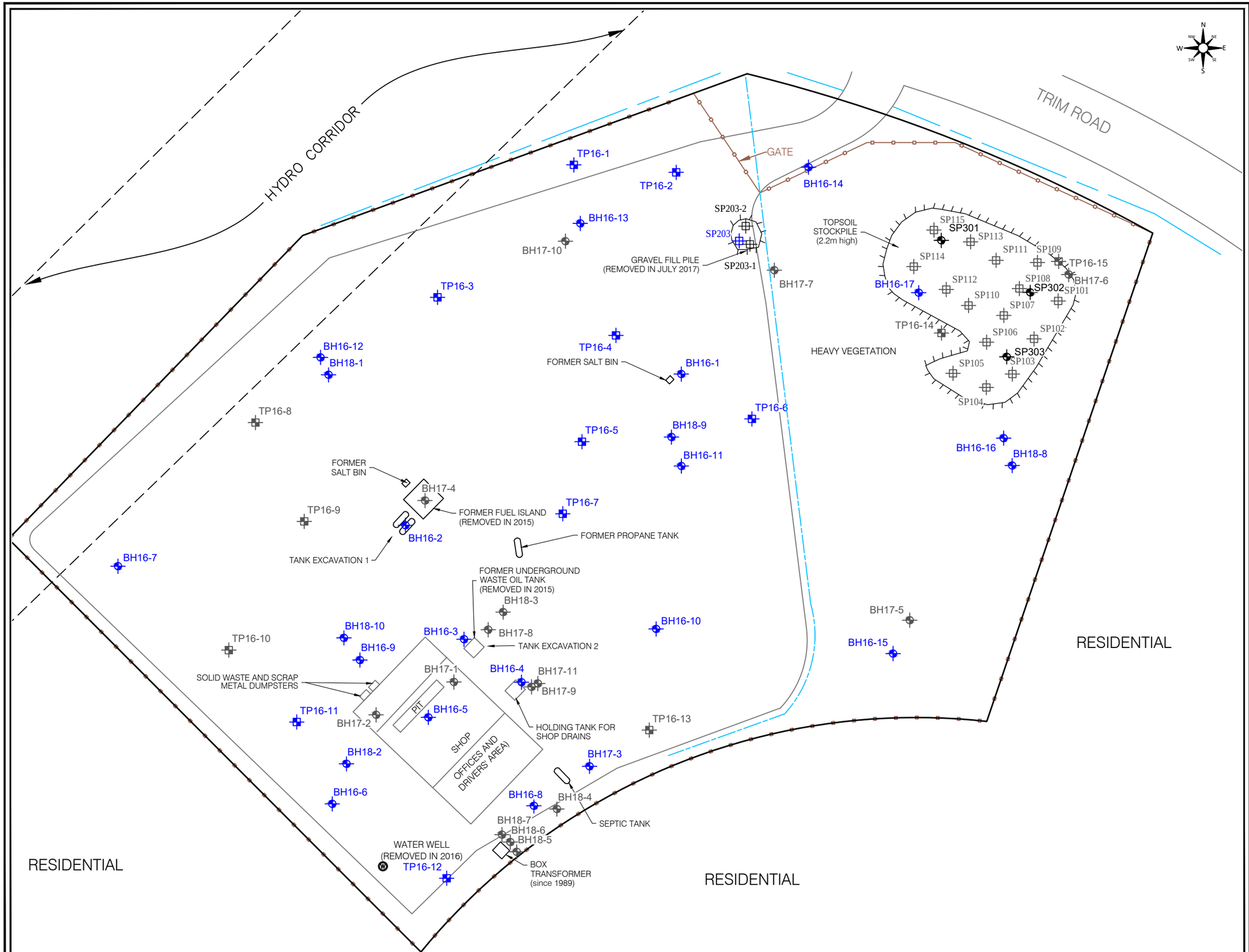
ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

FIGURE 9b



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sampled Borehole/Test Pit Location
- Borehole/Test Pit Not Sampled

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

Metres
10 0 10 20
1:1000

Title:
SAMPLING LOCATIONS FOR METALS IN SOIL

Project:
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2018

FIGURE 10

Sample	TP16-4-1	DUP-2
Depth (mbgs)	0.45	0.45
Barium	450	490

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Barium	240	270

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Barium	280	240

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Barium	370	360	230

Sample	TP16-7-1
Depth (mbgs)	0.7
Barium	240

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
Barium	72	57

Sample	BH16-17-1	BH16-17-2
Depth (mbgs)	1.07	2.74
Barium	150	150

Sample	BH16-12-1	BH16-12-2
Depth (mbgs)	1.22	2.74
Barium	260	330

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.2
Barium	360	280	310

Sample	BH16-7-1	BH16-7-2
Depth (mbgs)	0.3	2.74
Barium	110	220

Sample	TP16-6-1	TP16-6-2
Depth (mbgs)	0.5	1.3
Barium	320	370

Sample	BH16-16-1	BH16-16-2
Depth (mbgs)	1.07	2.44
Barium	320	300

Sample	BH18-8-1
Depth	10.2-10.6
Ba	290

Sample	BH18-9-1
Depth	10.2-10.6
Ba	300

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Barium	440	360

Sample	TP16-5-1
Depth (mbgs)	0.75
Barium	440

Sample	BH18-10-1
Depth	10.2-10.9
Ba	290

Sample	BH16-15-1	BH16-15-2
Depth (mbgs)	1.07	2.44
Barium	250	270

Sample	BH16-9-1	BH16-9-2
Depth (mbgs)	0.3	2.74
Barium	360	340

Sample	BH16-10-1	BH16-10-2
Depth (mbgs)	1.37	2.74
Barium	290	290

Sample	TP16-11-1
Depth (mbgs)	0.8
Barium	460

Sample	BH16-4-1	BH16-4-2
Depth (mbgs)	0.3	3.35
Barium	110	250

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Barium	200	240

Sample	BH17-3-2	DUP-1
Depth (mbgs)	0.76 - 1.5	0.76 - 1.5
Barium	210	190

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Barium	460	280

Sample	BH16-8-1	BH16-8-2
Depth (mbgs)	1.22	2.74
Barium	140	310

Sample	TP16-12-1	TP16-12-2
Depth (mbgs)	0.8	0.9
Barium	190	230

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Barium	120	250

HYDRO CORRIDOR

TP16-1
TP16-2
GATE
BH16-14
BH16-13
BH17-10
SP203-2
SP203
SP203-1
BH17-7
GRAVEL FILL PILE
(REMOVED IN JULY 2017)
TOPSOIL
STOCKPILE
(2.2m high)
SP115
SP301
SP113
SP111
SP109
SP114
TP16-15
BH16-17
SP112
SP108
SP302
BH17-6
SP110
SP101
SP107
TP16-14
SP106
SP102
SP303
SP105
SP103
SP104
HEAVY VEGETATION
TP16-3
BH16-12
BH18-1
TP16-4 (Fill)
FORMER SALT BIN
BH16-1
TP16-8
TP16-6
TP16-5
(Fill)
BH18-9
BH16-11
(Fill)
BH16-16
BH18-8
FORMER
SALT BIN
BH17-4
FORMER FUEL ISLAND
(REMOVED IN 2015)
TP16-9
TP16-7
BH16-2
FORMER PROPANE TANK
TANK EXCAVATION 1
BH16-7
FORMER UNDERGROUND
WASTE OIL TANK
(REMOVED IN 2015)
BH18-3
BH17-5
BH16-10
BH18-10
BH16-3
BH17-8
TANK EXCAVATION 2
BH16-15
TP16-10
BH16-9
BH17-1
BH16-4
BH17-11
BH17-9
SOLID WASTE AND SCRAP
METAL DUMPSTERS
PIT
BH16-5
TP16-11
(Fill)
BH17-2
SHOP
OFFICES AND
DRIVERS' AREA)
HOLDING TANK FOR
SHOP DRAINS
TP16-13
BH18-2
BH17-3
BH16-6
(Fill)
BH16-8
BH18-4
SEPTIC TANK
BH18-7
BH18-6
BH18-5
WATER WELL
(REMOVED IN 2016)
TP16-12
BOX
TRANSFORMER
(since 1989)

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Barium
- Sample Exceeds the Applicable SCS for Barium
- Borehole/Test Pit Not Sampled

Parameter	MOECC Table 6 Site Condition Standard
Barium	390

Units: µg/g

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title:
SOIL SAMPLING PLAN
CONTAMINANT DISTRIBUTION PLAN - BARIUM

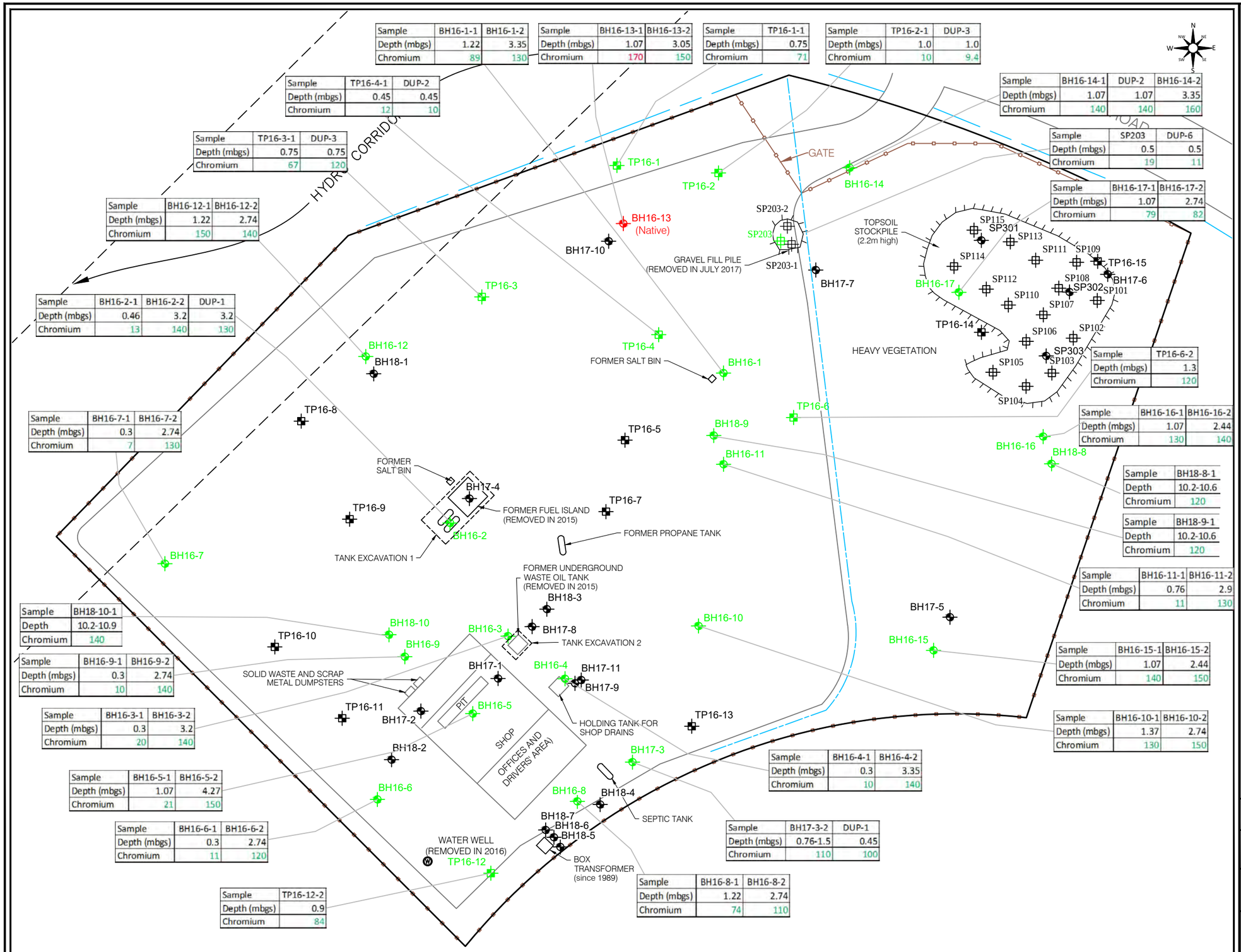
Project:
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2018

FIGURE 11



Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Chromium	89	130

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Chromium	170	150

Sample	TP16-1-1
Depth (mbgs)	0.75
Chromium	71

Sample	TP16-2-1	DUP-3
Depth (mbgs)	1.0	1.0
Chromium	10	9.4

Sample	TP16-4-1	DUP-2
Depth (mbgs)	0.45	0.45
Chromium	12	10

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Chromium	140	140	160

Sample	TP16-3-1	DUP-3
Depth (mbgs)	0.75	0.75
Chromium	67	120

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
Chromium	19	11

Sample	BH16-12-1	BH16-12-2
Depth (mbgs)	1.22	2.74
Chromium	150	140

Sample	BH16-17-1	BH16-17-2
Depth (mbgs)	1.07	2.74
Chromium	79	82

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.2
Chromium	13	140	130

Sample	TP16-6-2
Depth (mbgs)	1.3
Chromium	120

Sample	BH16-7-1	BH16-7-2
Depth (mbgs)	0.3	2.74
Chromium	7	130

Sample	BH16-16-1	BH16-16-2
Depth (mbgs)	1.07	2.44
Chromium	130	140

Sample	BH18-8-1
Depth	10.2-10.6
Chromium	120

Sample	BH18-9-1
Depth	10.2-10.6
Chromium	120

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Chromium	11	130

Sample	BH18-10-1
Depth	10.2-10.9
Chromium	140

Sample	BH16-15-1	BH16-15-2
Depth (mbgs)	1.07	2.44
Chromium	140	150

Sample	BH16-9-1	BH16-9-2
Depth (mbgs)	0.3	2.74
Chromium	10	140

Sample	BH16-10-1	BH16-10-2
Depth (mbgs)	1.37	2.74
Chromium	130	150

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Chromium	20	140

Sample	BH16-4-1	BH16-4-2
Depth (mbgs)	0.3	3.35
Chromium	10	140

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Chromium	21	150

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Chromium	11	120

Sample	BH17-3-2	DUP-1
Depth (mbgs)	0.76-1.5	0.45
Chromium	110	100

Sample	BH16-8-1	BH16-8-2
Depth (mbgs)	1.22	2.74
Chromium	74	110

Sample	TP16-12-2
Depth (mbgs)	0.9
Chromium	84

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Chromium
- Sample Exceeds the Applicable SCS for Chromium
- Borehole/Test Pit Not Sampled

Parameter	MOECC Table 6 Site Condition Standard
Chromium	160

Units: µg/g

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres 10 0 10 20 1:1000

Title: **SOIL SAMPLING PLAN CONTAMINANT DISTRIBUTION PLAN - CHROMIUM**

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 12

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Cobalt	21	24

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Cobalt	25	27

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
Cobalt	8.1	3.8

Sample	TP16-4-1	DUP-2
Depth (mbgs)	0.45	0.45
Cobalt	4.3	4.5

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Cobalt	27	31	28

Sample	BH16-12-1	BH16-12-2
Depth (mbgs)	1.22	2.74
Cobalt	24	26

Sample	BH16-17-1	BH16-17-2
Depth (mbss)	1.07	2.74
Cobalt	18	18

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.2
Cobalt	4.5	26	25

Sample	BH16-7-1	BH16-7-2
Depth (mbgs)	0.3	2.74
Cobalt	2.6	22

Sample	TP16-6-2
Depth (mbgs)	1.3
Cobalt	32

Sample	BH16-16-1	BH16-16-2
Depth (mbgs)	1.07	2.44
Cobalt	25	24

Sample	BH18-08
Depth (mbgs)	10.2-10.6
Cobalt	25

Sample	BH18-09
Depth (mbgs)	10.2-10.6
Cobalt	24

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Cobalt	6	24

Sample	BH18-10
Depth (mbgs)	10.2-10.9
Cobalt	26

Sample	BH16-15-1	BH16-15-2
Depth (mbgs)	1.07	2.44
Cobalt	26	26

Sample	BH16-9-1	BH16-9-2
Depth (mbgs)	0.3	2.74
Cobalt	5.6	24

Sample	BH16-10-1	BH16-10-2
Depth (mbgs)	1.37	2.74
Cobalt	23	27

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Cobalt	5.7	23

Sample	BH16-4-1	BH16-4-2
Depth (mbgs)	0.3	3.35
Cobalt	3.3	23

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Cobalt	8.7	27

Sample	BH17-3-2	DUP-1
Depth (mbgs)	0.76-1.5	0.45
Cobalt	24	21

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Cobalt	6.6	23

Sample	BH16-8-1	BH16-8-2
Depth (mbgs)	1.22	2.74
Cobalt	13	23

Sample	TP16-12-2
Depth (mbgs)	0.9
Cobalt	24

HYDRO CORRIDOR

TP16-1
TP16-2
BH16-14
GATE
BH16-13
BH17-10
SP203-2
SP203
SP203-1
GRAVEL FILL PILE (REMOVED IN JULY 2017)
BH17-7
TOPSOIL STOCKPILE (2.2m high)
SP115
SP301
SP113
SP111
SP109
SP114
TP16-15
BH17-6
BH16-17
SP112
SP108
SP302
SP101
SP110
SP107
TP16-14
SP106
SP102
SP303
SP105
SP103
SP104
HEAVY VEGETATION
TP16-3
TP16-4
FORMER SALT BIN
BH16-1
BH16-12
BH18-1
TP16-8
TP16-6
BH18-9
TP16-5
BH16-11
BH16-16
BH18-8
FORMER SALT BIN
BH17-4
FORMER FUEL ISLAND (REMOVED IN 2015)
TP16-9
TP16-7
BH16-2
FORMER PROPANE TANK
TANK EXCAVATION 1
BH16-7
FORMER UNDERGROUND WASTE OIL TANK (REMOVED IN 2015)
BH18-3
BH17-5
BH16-10
BH16-15
BH18-10
BH16-3
BH17-8
TANK EXCAVATION 2
TP16-10
BH16-9
BH17-1
BH16-4
BH17-11
BH17-9
SOLID WASTE AND SCRAP METAL DUMPSTERS
PIT
BH16-5
TP16-11
BH17-2
HOLDING TANK FOR SHOP DRAINS
TP16-13
SHOP
OFFICES AND DRIVERS' AREA)
BH18-2
BH17-3
BH16-6
BH16-8
BH18-4
BH18-7
BH18-6
BH18-5
SEPTIC TANK
WATER WELL (REMOVED IN 2016)
TP16-12
BOX TRANSFORMER (since 1989)

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Cobalt
- Sample Exceeds the Applicable SCS for Cobalt
- Borehole/Test Pit Not Sampled

NOTE

Elevated Cobalt considered as natural background condition due to exceedances in native soils.

mbss - metres below stockpile surface

Parameter	MOECC Table 6 Site Condition Standard
Cobalt	22

Units: µg/g

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20

1:1000

Title: **SOIL SAMPLING PLAN BACKGROUND LEVELS - COBALT**

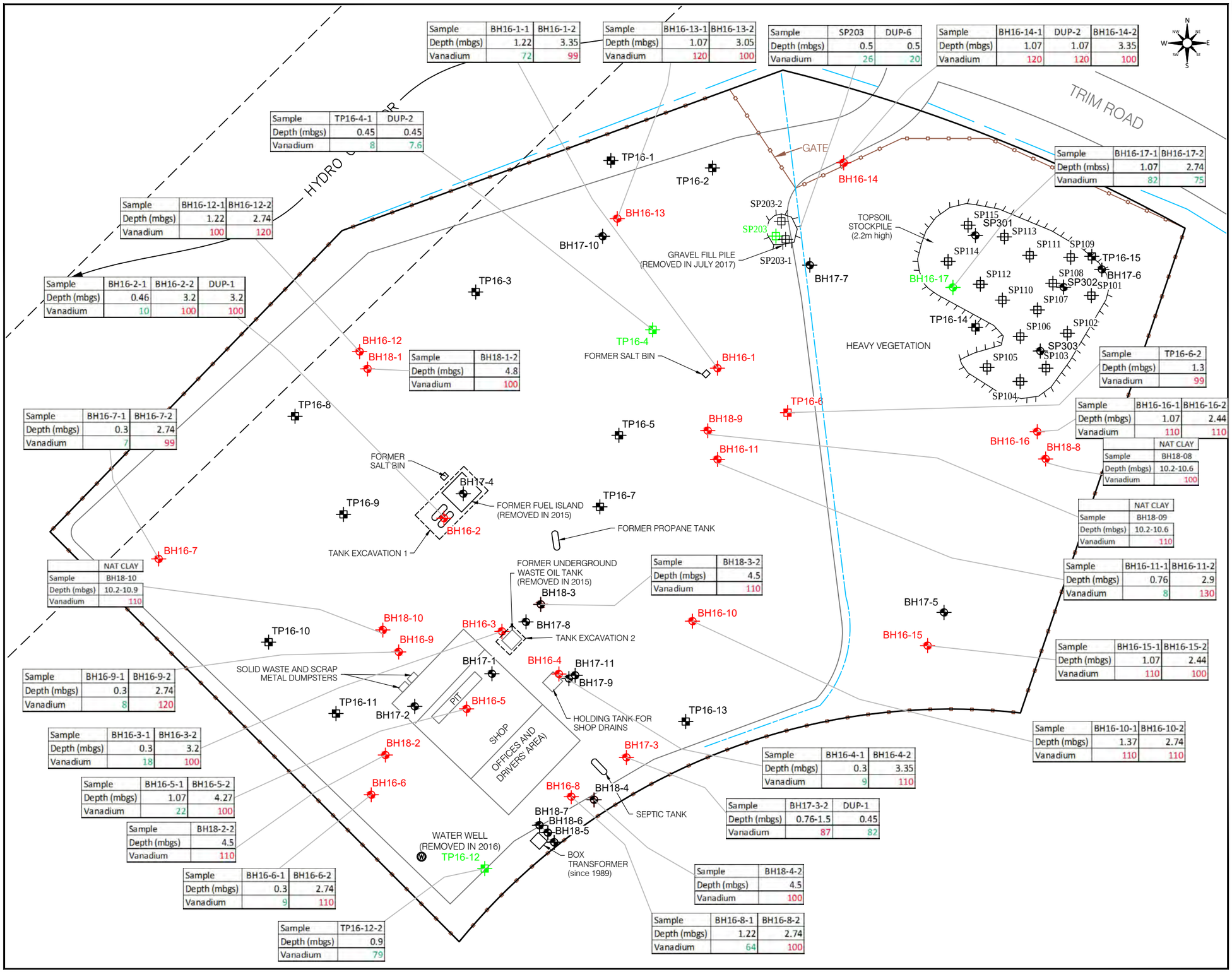
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 13



Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Vanadium	72	99

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Vanadium	120	100

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
Vanadium	26	20

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Vanadium	120	120	100

Sample	TP16-4-1	DUP-2
Depth (mbgs)	0.45	0.45
Vanadium	8	7.6

Sample	BH16-17-1	BH16-17-2
Depth (mbss)	1.07	2.74
Vanadium	82	75

Sample	BH16-12-1	BH16-12-2
Depth (mbgs)	1.22	2.74
Vanadium	100	120

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.2
Vanadium	10	100	100

Sample	BH18-1-2
Depth (mbgs)	4.8
Vanadium	100

Sample	TP16-6-2
Depth (mbgs)	1.3
Vanadium	99

Sample	BH16-7-1	BH16-7-2
Depth (mbgs)	0.3	2.74
Vanadium	7	99

Sample	BH16-16-1	BH16-16-2
Depth (mbgs)	1.07	2.44
Vanadium	110	110

	NAT CLAY
Sample	BH18-08
Depth (mbgs)	10.2-10.6
Vanadium	100

	NAT CLAY
Sample	BH18-09
Depth (mbgs)	10.2-10.6
Vanadium	110

	NAT CLAY
Sample	BH18-10
Depth (mbgs)	10.2-10.9
Vanadium	110

Sample	BH18-3-2
Depth (mbgs)	4.5
Vanadium	110

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Vanadium	8	130

Sample	BH16-15-1	BH16-15-2
Depth (mbgs)	1.07	2.44
Vanadium	110	100

Sample	BH16-9-1	BH16-9-2
Depth (mbgs)	0.3	2.74
Vanadium	8	120

Sample	BH16-10-1	BH16-10-2
Depth (mbgs)	1.37	2.74
Vanadium	110	110

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Vanadium	18	100

Sample	BH16-4-1	BH16-4-2
Depth (mbgs)	0.3	3.35
Vanadium	9	110

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Vanadium	22	100

Sample	BH17-3-2	DUP-1
Depth (mbgs)	0.76-1.5	0.45
Vanadium	87	82

Sample	BH18-2-2
Depth (mbgs)	4.5
Vanadium	110

Sample	BH18-4-2
Depth (mbgs)	4.5
Vanadium	100

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Vanadium	9	110

Sample	BH16-8-1	BH16-8-2
Depth (mbgs)	1.22	2.74
Vanadium	64	100

Sample	TP16-12-2
Depth (mbgs)	0.9
Vanadium	79

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Vanadium
- Sample Exceeds the Applicable SCS for Vanadium
- Borehole/Test Pit Not Sampled

NOTE

Elevated Vanadium considered as natural background condition due to exceedances in native soils.

mbss - metres below stockpile surface

Parameter	MOECC Table 6 Site Condition Standard
Vanadium	86

Units: µg/g

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres 10 0 10 20 1:1000

Title: **SOIL SAMPLING PLAN BACKGROUND LEVELS - VANADIUM**

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 14

Sample	SP203	DUP-6
Depth (mbgs)	0.5	0.5
F3 (C16-C34 Hydrocarbons	1400	1900
F4 (C34-C50 Hydrocarbons	4600	6300

REMOVED IN 2017

HYDRO CORRIDOR

TRIM ROAD

GATE

TP16-1

TP16-2

BH16-14 [1.07]

[0.0]
SP203-2

BH16-13 [1.07]

[0.50] SP203

BH17-10

GRAVEL FILL PILE
(REMOVED IN JULY 2017)

SP203-1
[0.0]

BH17-7 [0.38]

TOPSOIL
STOCKPILE
(2.2m high)

SP115
SP301
SP113
SP111
SP109
SP114
TP16-15
[1.07]
BH16-17
SP112
SP108
SP302
SP101
BH17-6 [0.38]
SP110
SP107
TP16-14
SP106
SP102
SP303
SP105
SP103
SP104

HEAVY VEGETATION

TP16-3

BH16-12 [1.22]

BH18-1

TP16-4

FORMER SALT BIN

BH16-1 [1.22]
[3.35]

TP16-6

TP16-8

TP16-5

BH18-9

BH16-11

BH16-16

BH18-8

FORMER
SALT BIN

BH17-4 [1.13]

FORMER FUEL ISLAND
(REMOVED IN 2015)

TP16-9

TP16-7

BH16-2
[0.46]
[3.20]

FORMER PROPANE TANK

TANK EXCAVATION 1

BH16-7 [0.3]

FORMER UNDERGROUND
WASTE OIL TANK
(REMOVED IN 2015)

BH18-3

[0.30]
[3.20]

BH16-10 [1.37]

[0.38] BH17-5

BH16-15 [1.07]

BH18-10

TP16-10

BH16-3

BH17-8 [1.13]

TANK EXCAVATION 2

BH16-9
[0.3]

[0.6]
BH17-1

[0.30] [3.35]
BH16-4

BH17-11

BH17-9 [0.75]

SOLID WASTE AND SCRAP
METAL DUMPSTERS

PIT

BH16-5 [1.07]
[4.27]

TP16-11

BH17-2
[1.9]

HOLDING TANK FOR
SHOP DRAINS

TP16-13

SHOP
OFFICES AND
DRIVERS AREA)

BH18-2

BH17-3 [1.13]

[1.22]
BH16-8

BH18-4

BH16-6 [0.3]

SEPTIC TANK

BH18-7

BH18-6

BH18-5

WATER WELL
(REMOVED IN 2016)

TP16-12

BOX
TRANSFORMER
(since 1989)

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Sample Exceeds the Applicable SCS for One or More Analyzed Parameters
- Borehole/Test Pit Not Sampled
- [0.6] Depth of Sample Analyzed (metres)
- Tested for F1-F only

NOTE

Soil samples from BH16-2-2 and BH16-3-2 had elevated MDLs due to high moisture content of soil analyzed.

Parameter	MOECC Table 6 SCS
F3 (C16-C34 Hydrocarbons)	1300
F4 (C34-C50 Hydrocarbons)	5600

Units: µg/g

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

Metres
10 0 10 20
1:1000

Title: **SOIL SAMPLING PLAN**
CONTAMINANT DISTRIBUTION PLAN - PHCs

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 15a

Sample	BH16-2-1	BH16-2-2	DUP-1
Depth (mbgs)	0.46	3.2	3.2
Bromomethane	<0.05	<0.1	<0.1
1,4-Dichlorobenzene	<0.05	<0.1	<0.1
1,2-Dichloroethane	<0.05	<0.1	<0.1
1,1-Dichloroethylene	<0.05	<0.1	<0.1
1,2-Dichloropropane	<0.05	<0.1	<0.1
Ethylene Dibromide	<0.05	<0.1	<0.1
1,1,1,2-Tetrachloroethane	<0.05	<0.1	<0.1
1,1,2,2-Tetrachloroethane	<0.05	<0.1	<0.1
Vinyl Chloride	<0.02	<0.04	<0.04

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Bromomethane	<0.05	<0.1
1,4-Dichlorobenzene	<0.05	<0.1
1,2-Dichloroethane	<0.05	<0.1
1,1-Dichloroethylene	<0.05	<0.1
1,2-Dichloropropane	<0.05	<0.1
Ethylene Dibromide	<0.05	<0.1
1,1,1,2-Tetrachloroethane	<0.05	<0.1
1,1,2,2-Tetrachloroethane	<0.05	<0.1
Vinyl Chloride	<0.02	<0.04

CORRIDOR
TRIM ROAD
GATE
TP16-1
TP16-2
BH16-14 [1.07]
[0.0]
SP203-2
BH16-13 [1.07]
[0.50] SP203
BH17-10
GRAVEL FILL PILE
(REMOVED IN JULY 2017)
SP203-1
[0.0]
BH17-7
TOPSOIL
STOCKPILE
(2.2m high)
SP115
SP301
SP113
SP111
SP109
SP114
TP16-15
SP112
SP108
BH17-6 [0.38]
BH16-17 [1.07]
SP302
SP101
SP110
SP107
TP16-14
SP106
SP102
SP303
SP105
SP103
SP104
HEAVY VEGETATION
TP16-3
TP16-4
BH16-12 [1.22]
BH18-1
FORMER SALT BIN
BH16-1 [1.22]
[3.35]
TP16-6
TP16-5
BH18-9
BH16-11
TP16-8
BH16-16
BH18-8
FORMER
SALT BIN
BH17-4 [1.13]
FORMER FUEL ISLAND
(REMOVED IN 2015)
TP16-9
TP16-7
BH16-2
[0.46]
[3.20]
FORMER PROPANE TANK
TANK EXCAVATION 1
BH16-7 [0.3]
FORMER UNDERGROUND
WASTE OIL TANK
(REMOVED IN 2015)
BH18-3
[0.30]
[3.20]
BH16-3
BH17-8 [1.13]
BH18-10
[0.3] BH16-9
TP16-10
TANK EXCAVATION 2
BH16-10 [1.37]
[0.38] BH17-5
BH16-15 [1.07]
[0.30] [3.35]
BH16-4
BH17-11
BH17-1 [0.6]
SOLID WASTE AND SCRAP
METAL DUMPSTERS
BH17-9 [0.75]
PIT
BH16-5 [1.07]
[4.27]
TP16-11
BH17-2
[1.9]
HOLDING TANK FOR
SHOP DRAINS
TP16-13
SHOP
OFFICES AND
DRIVERS AREA)
BH18-2
BH17-3 [1.13]
BH16-6 [0.3]
BH16-8 [1.22]
BH18-4
SEPTIC TANK
BH18-7
BH18-6
BH18-5
WATER WELL
(REMOVED IN 2016)
TP16-12
BOX
TRANSFORMER
(since 1989)

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Sample Exceeds the Applicable SCS for One or More Analyzed Parameters
- Borehole/Test Pit Not Sampled
- [0.6] Depth of Sample Analyzed (metres)

NOTE

Soil samples from BH16-2-2 and BH16-3-2 had elevated MDLs due to high moisture content of soil analyzed.

Parameter	MOECC Table 6 SCS
Bromomethane	0.05
1,4-Dichlorobenzene	0.097
1,2-Dichloroethane	0.05
1,1-Dichloroethylene	0.05
1,2-Dichloropropane	0.085
Ethylene Dibromide	0.05
1,1,1,2-Tetrachloroethane	0.05
1,1,2,2-Tetrachloroethane	0.05
Vinyl Chloride	0.022

Units: µg/g

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

Metres 10 0 10 20 1:1000

Title: **SOIL SAMPLING PLAN CONTAMINANT DISTRIBUTION PLAN - VOCs**

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

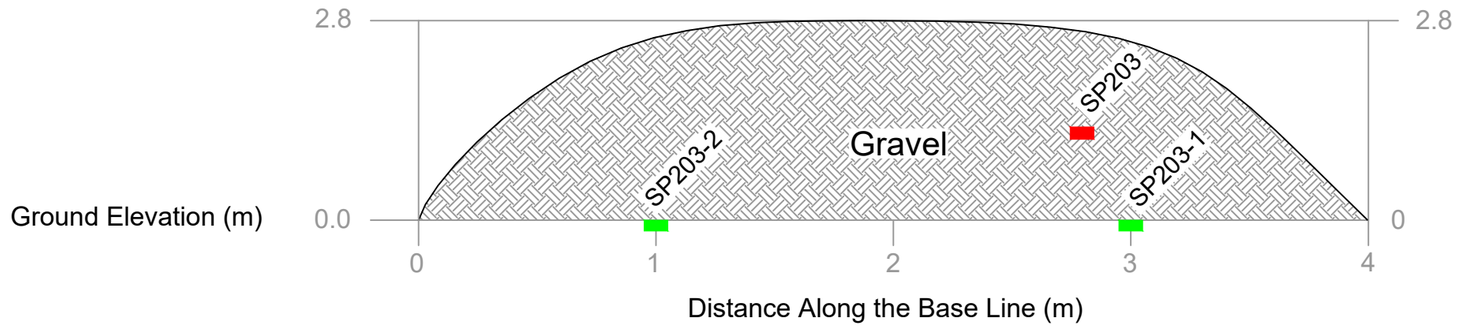
Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

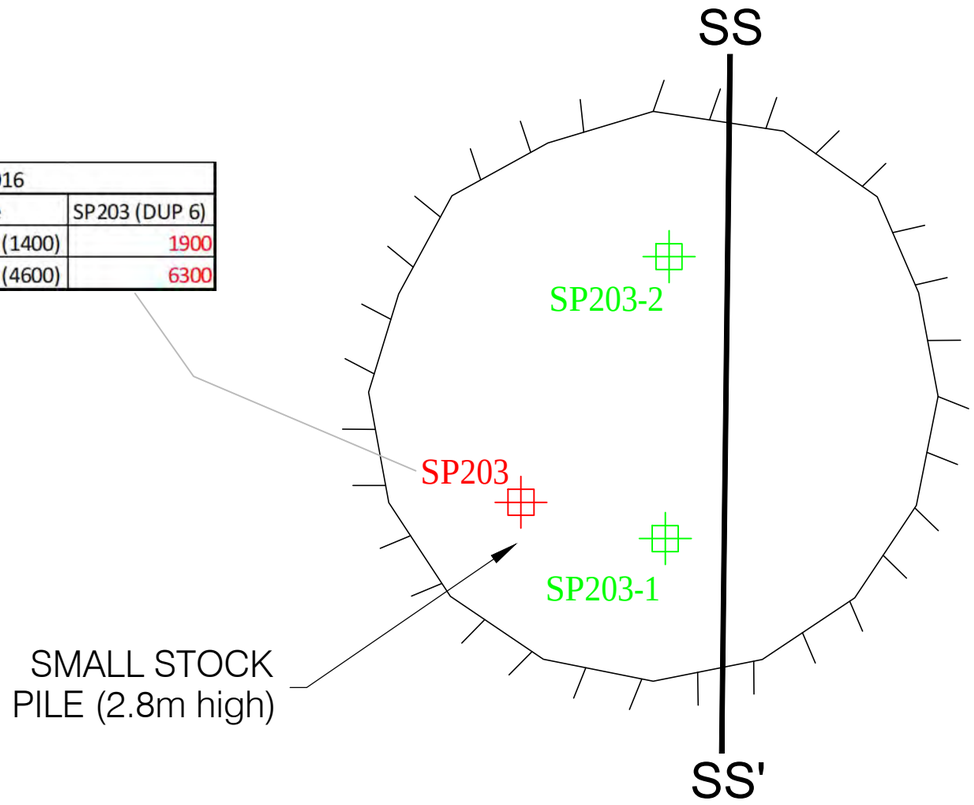
FIGURE 15b

SECTION VIEW
SS-SS'

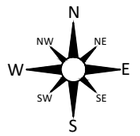


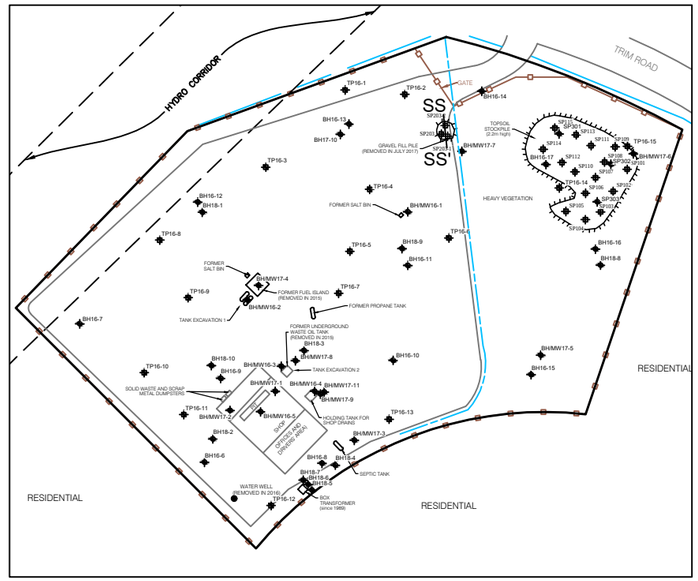
HORIZONTAL EXAGGERATION 10x
VERTICAL EXAGGERATION 3x

PLAN VIEW



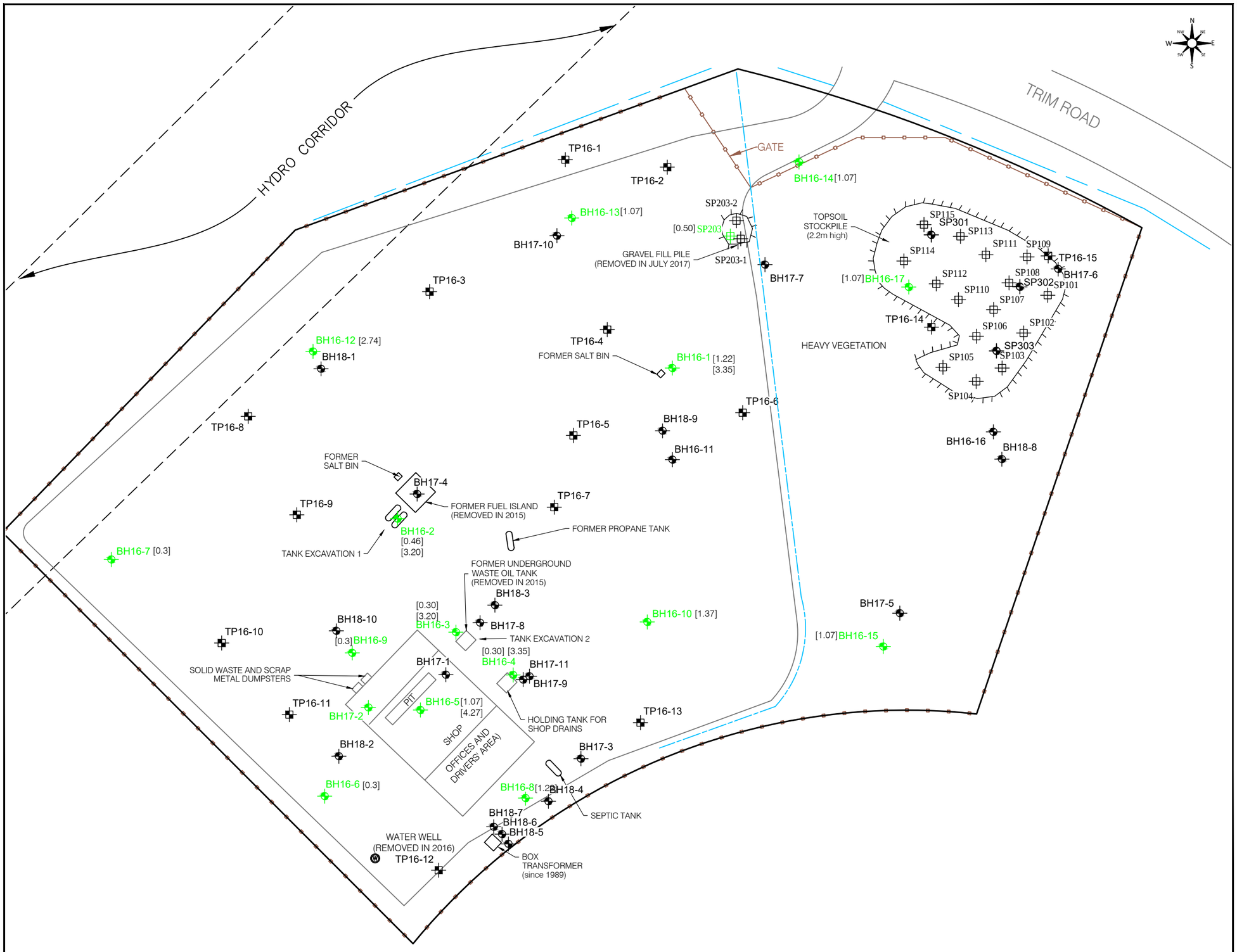
MAY 2016	
Sample	SP203 (DUP 6)
PHC F3 (1400)	1900
PHC F4 (4600)	6300





NOTE:
THIS SMALL STOCKPILE WAS REMOVED FOR OFFSITE DISPOSAL IN JULY 2017

Title:	**CROSS SECTION SS-SS' - PHCs & VOCs**
ARCADIS	Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**
Date: **OCTOBER 2018**	Client: **FirstGroup America Inc.**
	FIGURE 15c



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Borehole/Test Pit Not Sampled
- [0.6] Depth of Sample Analyzed (metres)

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

Metres 10 0 10 20
1:1000

Title: **SOIL SAMPLING PLAN AND RESULTS - PAHs**

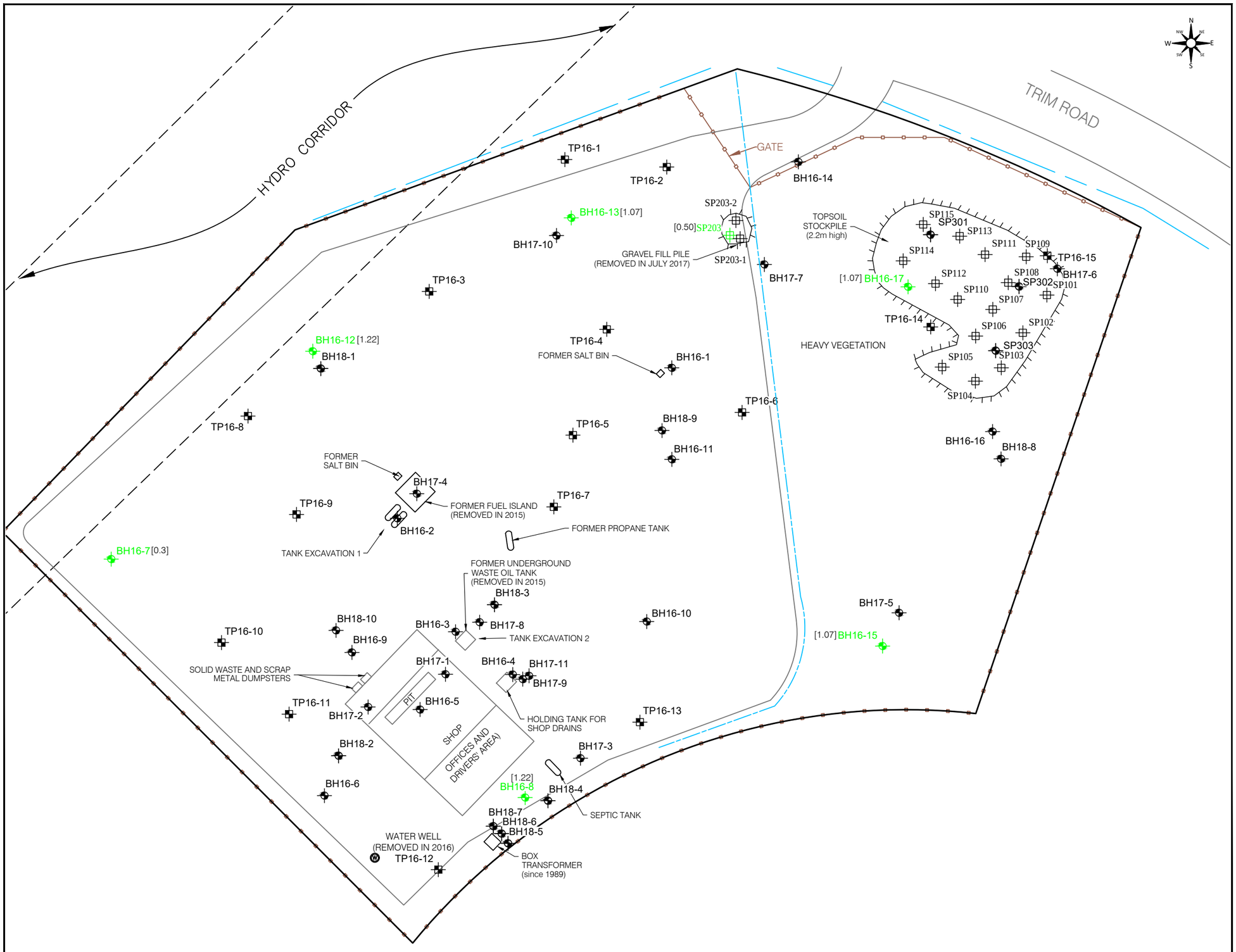
Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 16



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Borehole/Test Pit Not Sampled
- [0.6] Depth of Sample Analyzed (metres)

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

Metres 10 0 10 20
1:1000

Title: **SOIL SAMPLING PLAN AND RESULTS - PESTICIDES AND HERBICIDES**

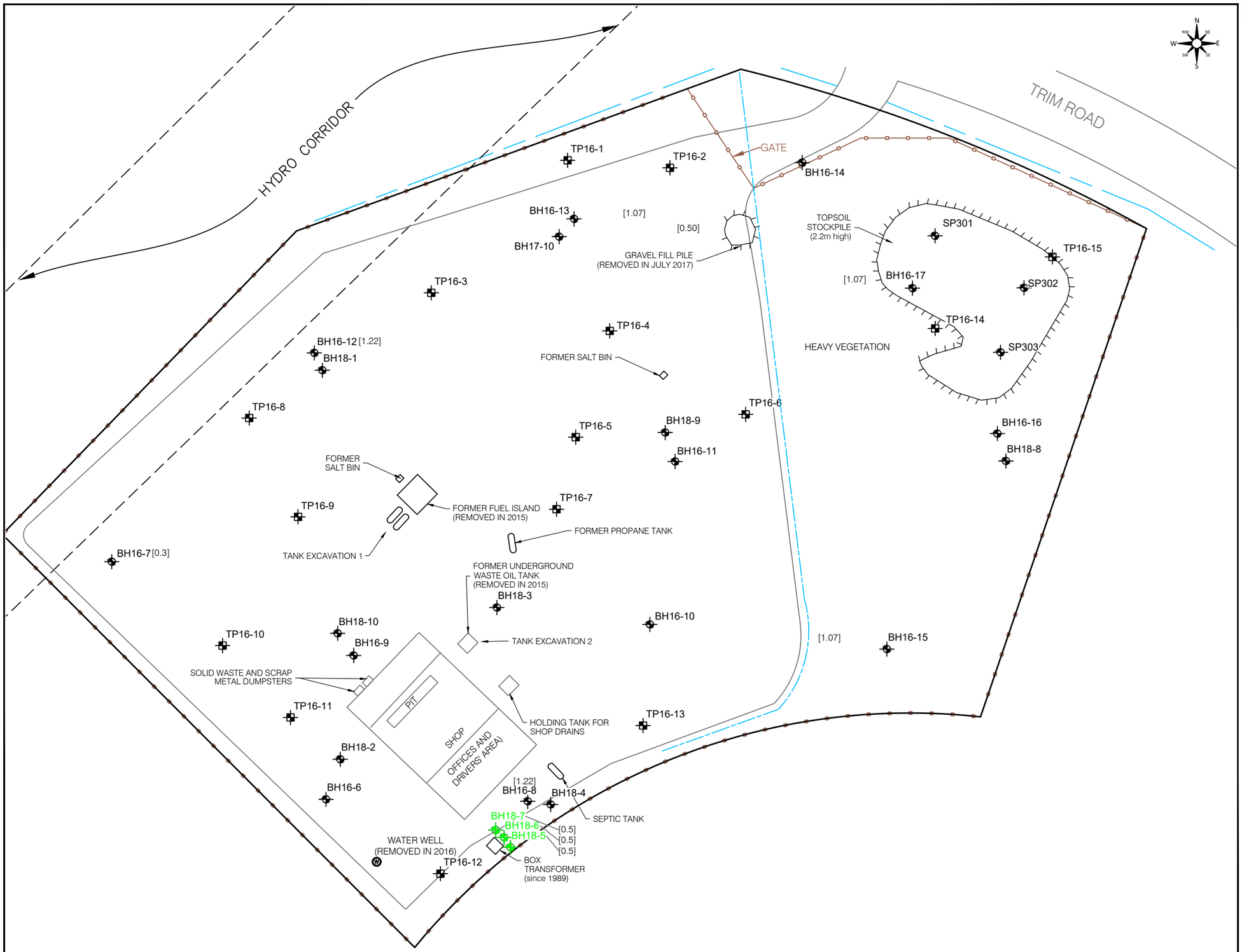
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 17a



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Borehole/Test Pit Not Sampled
- [0.5] Depth of Sample Analyzed (metres)

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **SOIL SAMPLING PLAN AND RESULTS - PCBs**

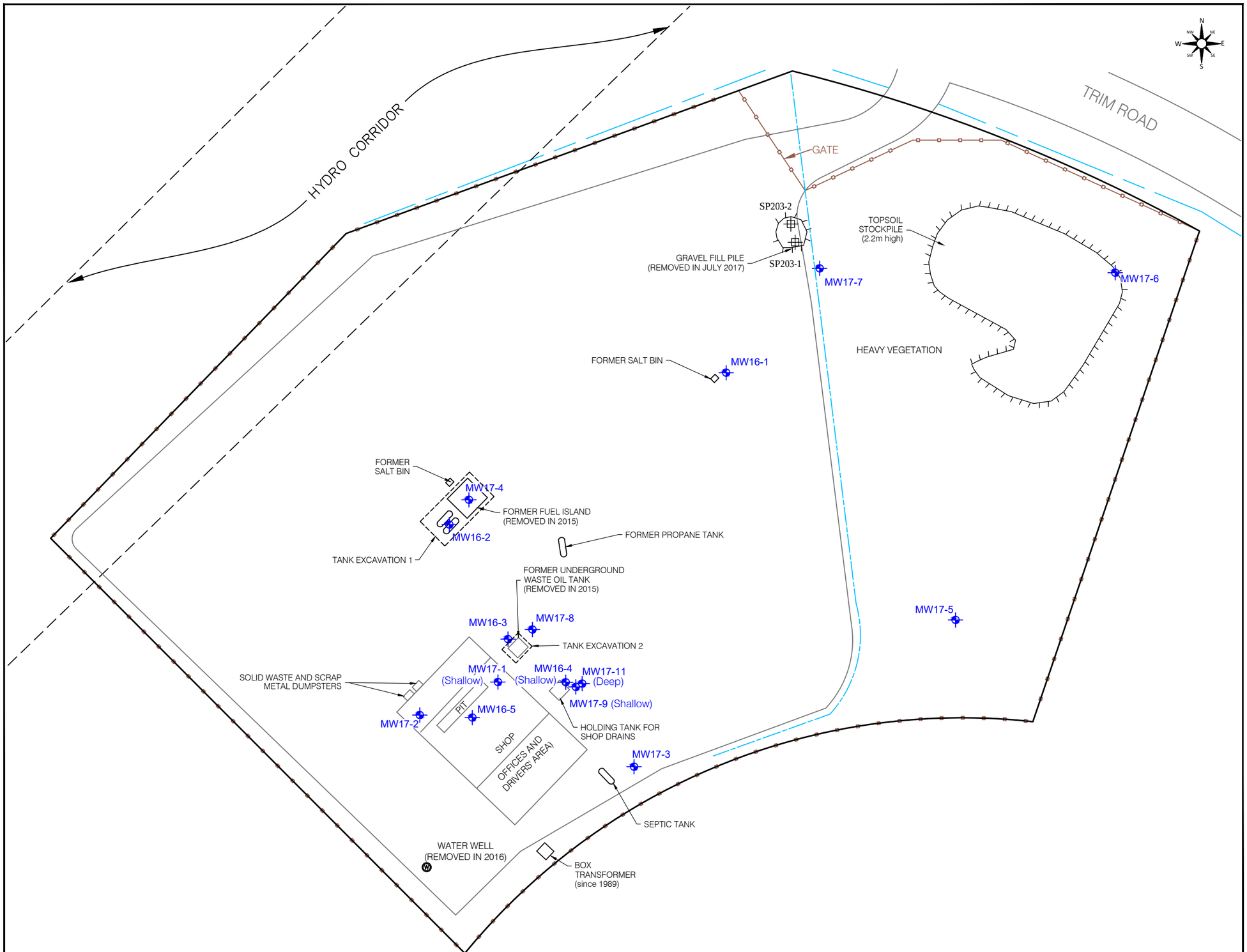
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 17b



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sampled Borehole/Test Pit Location

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title:
GROUNDWATER SAMPLING PLAN
CONTAMINANT DISTRIBUTION PLAN - METALS & INORGANICS

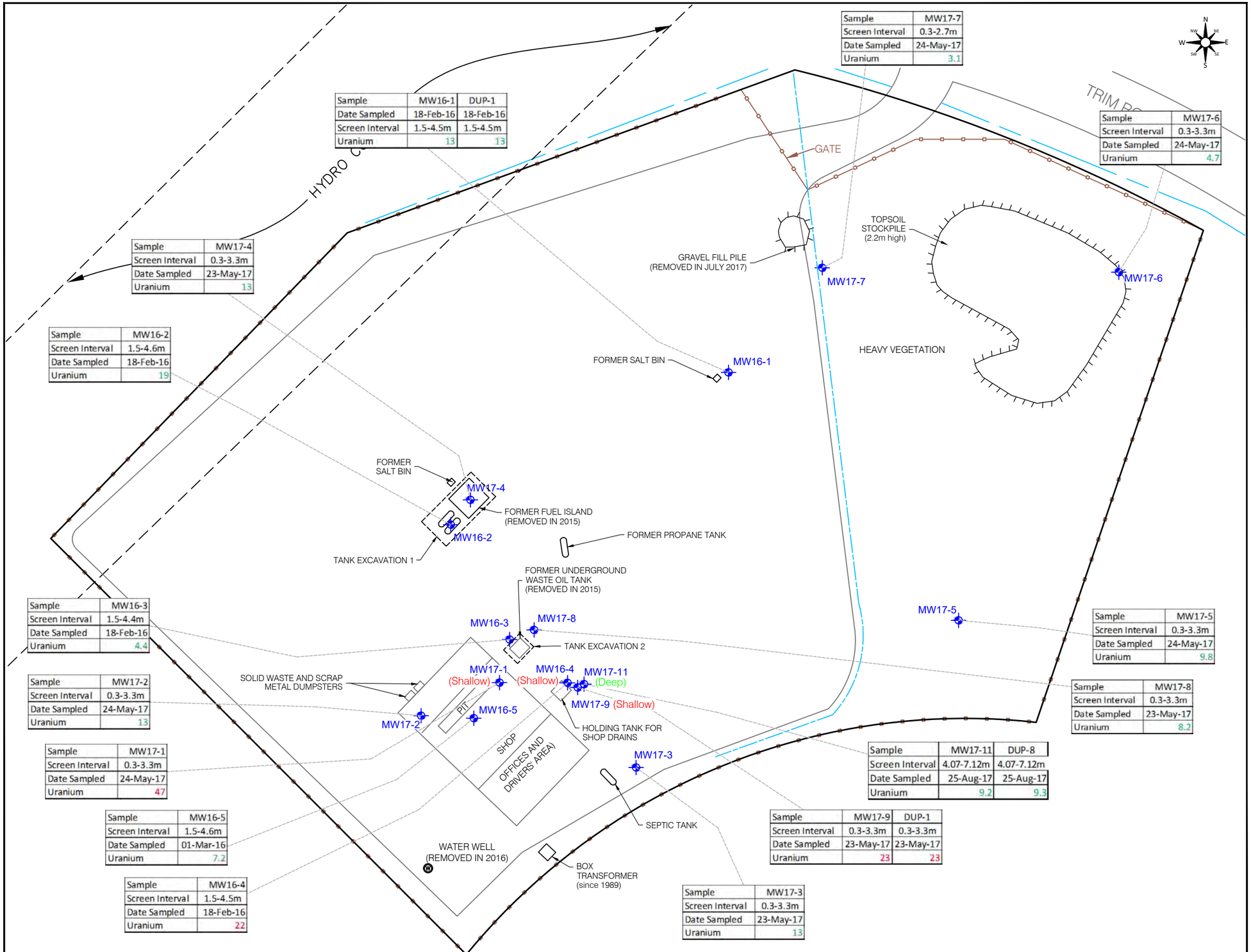
Project:
ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2018

FIGURE 18



Sample	MW16-1	DUP-1
Date Sampled	18-Feb-16	18-Feb-16
Screen Interval	1.5-4.5m	1.5-4.5m
Uranium	13	13

Sample	MW17-7
Screen Interval	0.3-2.7m
Date Sampled	24-May-17
Uranium	3.1

Sample	MW17-6
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Uranium	4.7

Sample	MW17-4
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Uranium	13

Sample	MW16-2
Screen Interval	1.5-4.6m
Date Sampled	18-Feb-16
Uranium	19

Sample	MW16-3
Screen Interval	1.5-4.4m
Date Sampled	18-Feb-16
Uranium	4.4

Sample	MW17-5
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Uranium	9.8

Sample	MW17-2
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Uranium	13

Sample	MW17-8
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Uranium	8.2

Sample	MW17-1
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Uranium	47

Sample	MW17-11	DUP-8
Screen Interval	4.07-7.12m	4.07-7.12m
Date Sampled	25-Aug-17	25-Aug-17
Uranium	9.2	9.3

Sample	MW16-5
Screen Interval	1.5-4.6m
Date Sampled	01-Mar-16
Uranium	7.2

Sample	MW17-9	DUP-1
Screen Interval	0.3-3.3m	0.3-3.3m
Date Sampled	23-May-17	23-May-17
Uranium	23	23

Sample	MW16-4
Screen Interval	1.5-4.5m
Date Sampled	18-Feb-16
Uranium	22

Sample	MW17-3
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Uranium	13

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Uranium
- Sample Exceeds the Applicable SCS for Uranium
- Monitoring Well Not Sampled

Parameter	MOECC Table 6 Site Condition Standard
Uranium	20

Units: µg/L

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER SAMPLING PLAN CONTAMINANT DISTRIBUTION PLAN - URANIUM**

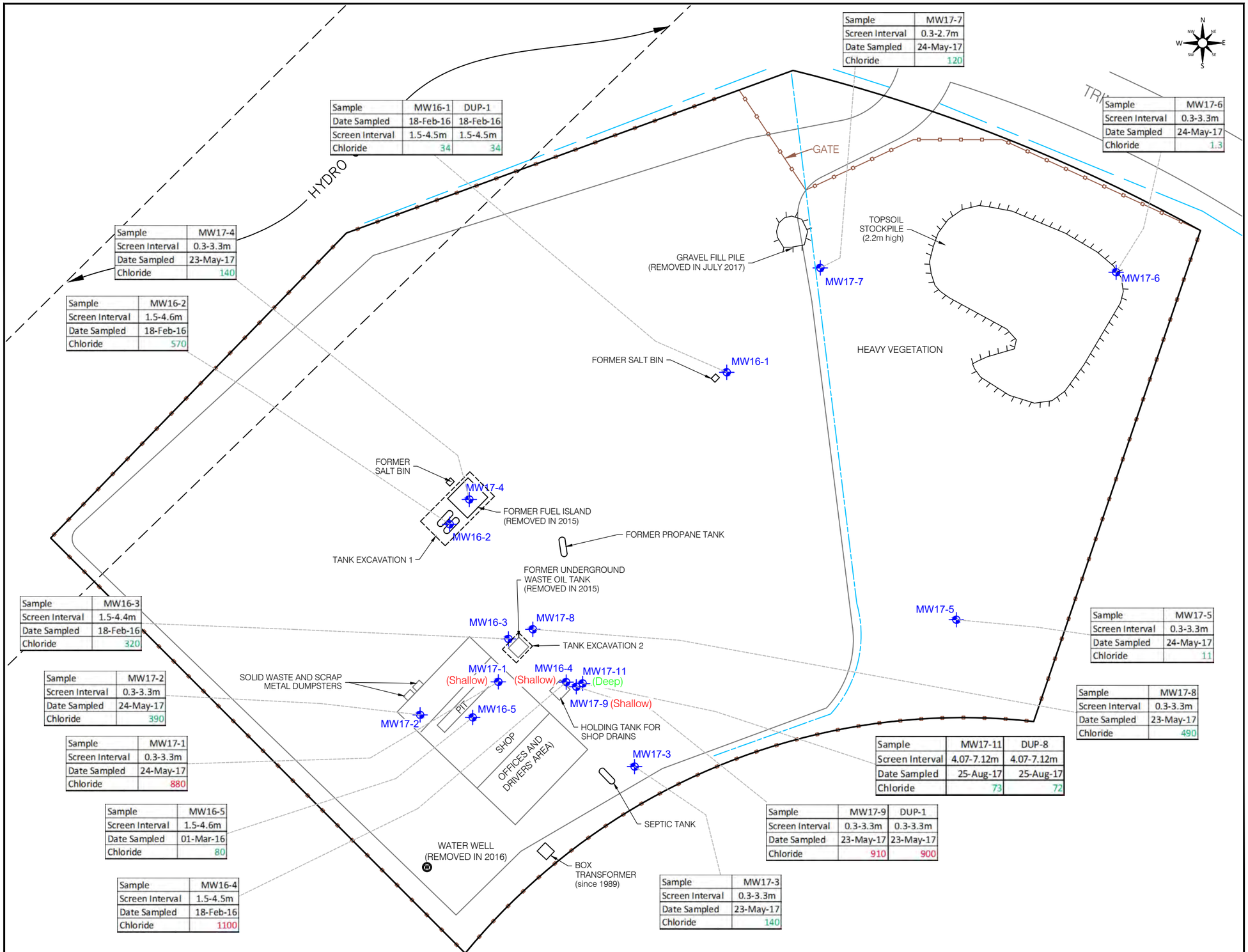
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 19



Sample	MW16-1	DUP-1
Date Sampled	18-Feb-16	18-Feb-16
Screen Interval	1.5-4.5m	1.5-4.5m
Chloride	34	34

Sample	MW17-7
Screen Interval	0.3-2.7m
Date Sampled	24-May-17
Chloride	120

Sample	MW17-6
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Chloride	1.3

Sample	MW17-4
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Chloride	140

Sample	MW16-2
Screen Interval	1.5-4.6m
Date Sampled	18-Feb-16
Chloride	570

Sample	MW16-3
Screen Interval	1.5-4.4m
Date Sampled	18-Feb-16
Chloride	320

Sample	MW17-5
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Chloride	11

Sample	MW17-2
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Chloride	390

Sample	MW17-8
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Chloride	490

Sample	MW17-1
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Chloride	880

Sample	MW17-11	DUP-8
Screen Interval	4.07-7.12m	4.07-7.12m
Date Sampled	25-Aug-17	25-Aug-17
Chloride	73	72

Sample	MW16-5
Screen Interval	1.5-4.6m
Date Sampled	01-Mar-16
Chloride	80

Sample	MW17-9	DUP-1
Screen Interval	0.3-3.3m	0.3-3.3m
Date Sampled	23-May-17	23-May-17
Chloride	910	900

Sample	MW16-4
Screen Interval	1.5-4.5m
Date Sampled	18-Feb-16
Chloride	1100

Sample	MW17-3
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Chloride	140

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for Chloride
- Sample Exceeds the Applicable SCS for Chloride
- Monitoring Well Not Sampled

Parameter	MOECC Table 6 Site Condition Standard
Chloride	790

Units: mg/L

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER SAMPLING PLAN CONTAMINANT DISTRIBUTION PLAN -CHLORIDE**

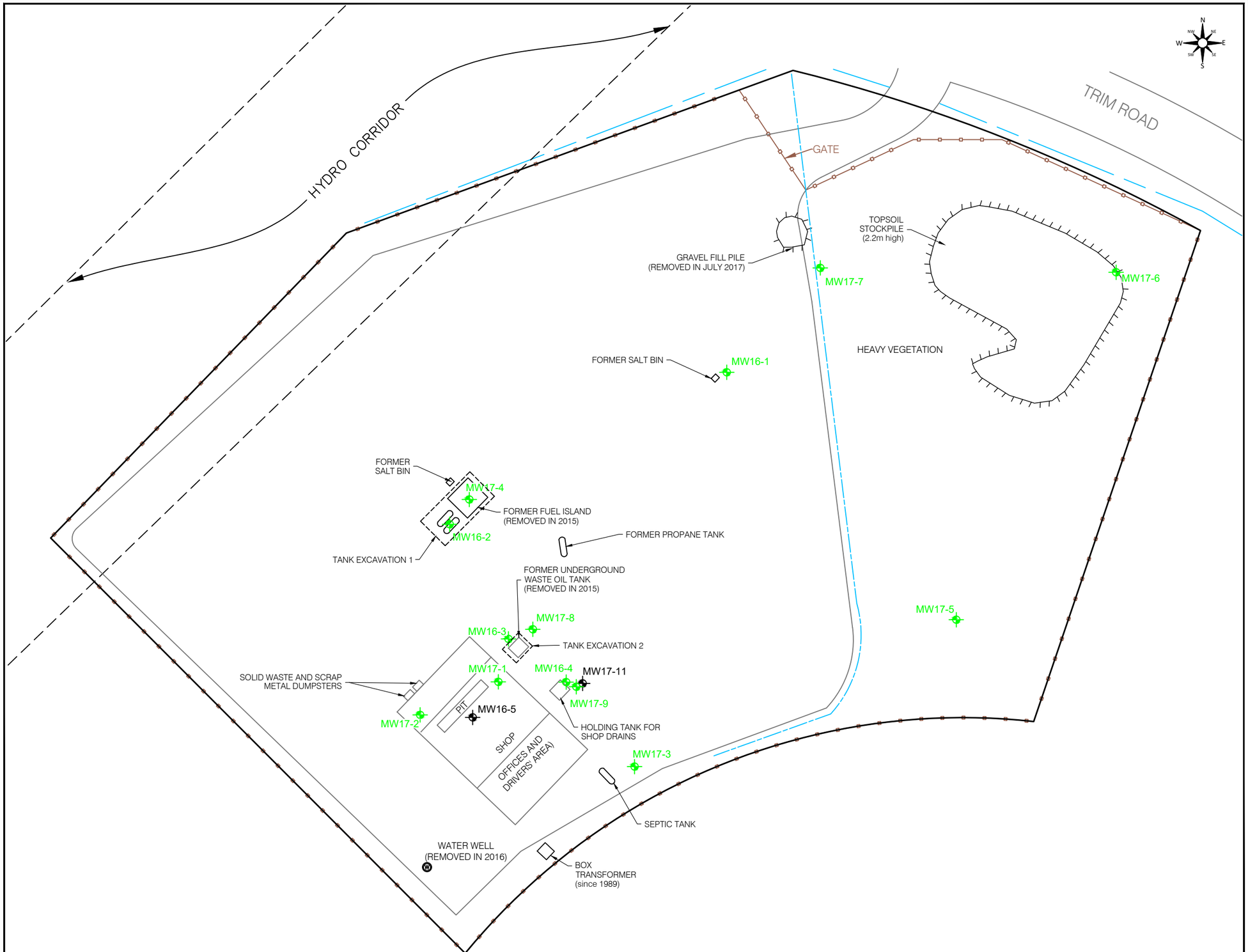
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 20



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Monitoring Well Not Sampled

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER SAMPLING PLAN AND RESULTS - PHCs & VOCs**

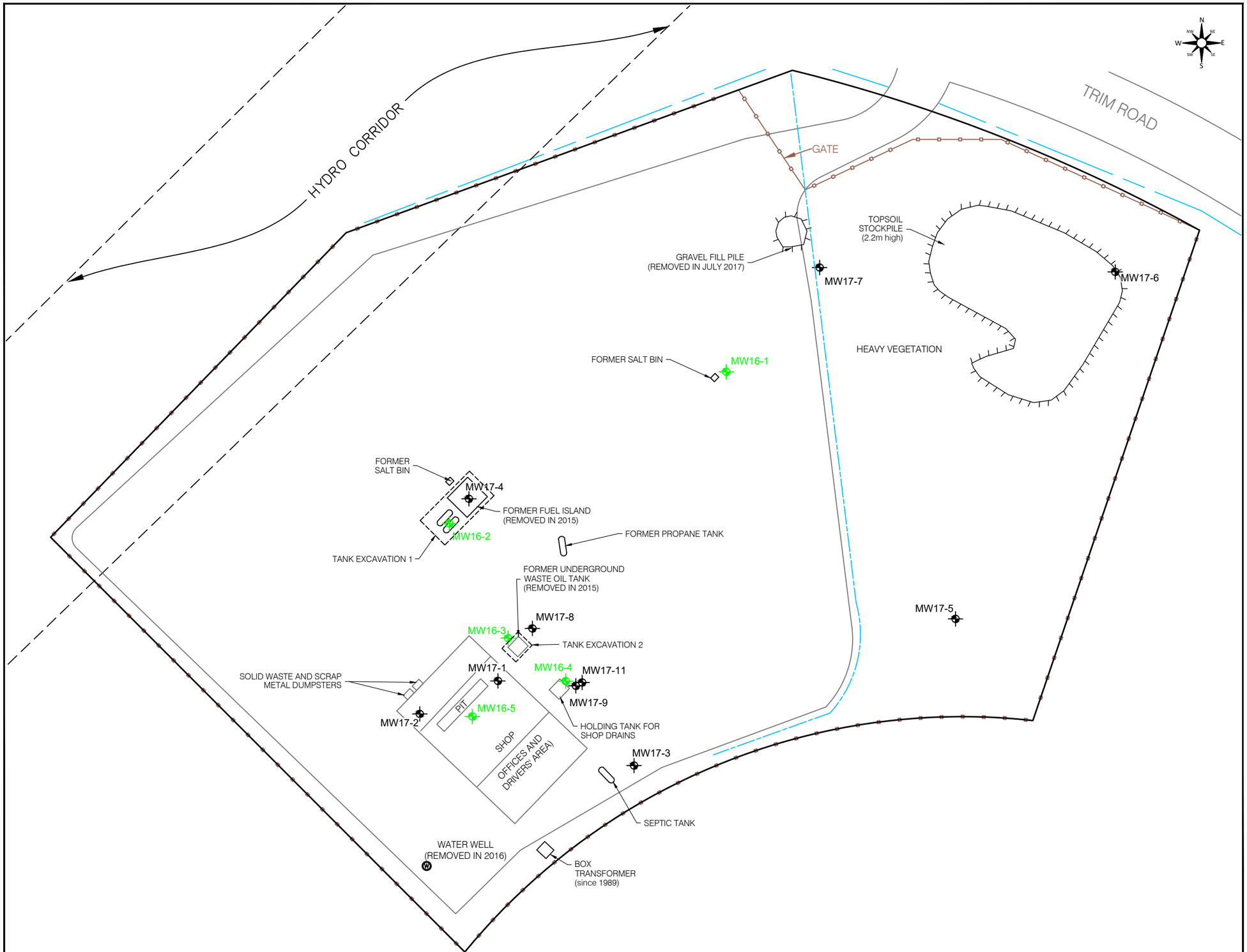
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 21



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Monitoring Well Not Sampled

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER SAMPLING PLAN AND RESULTS - PAHs**

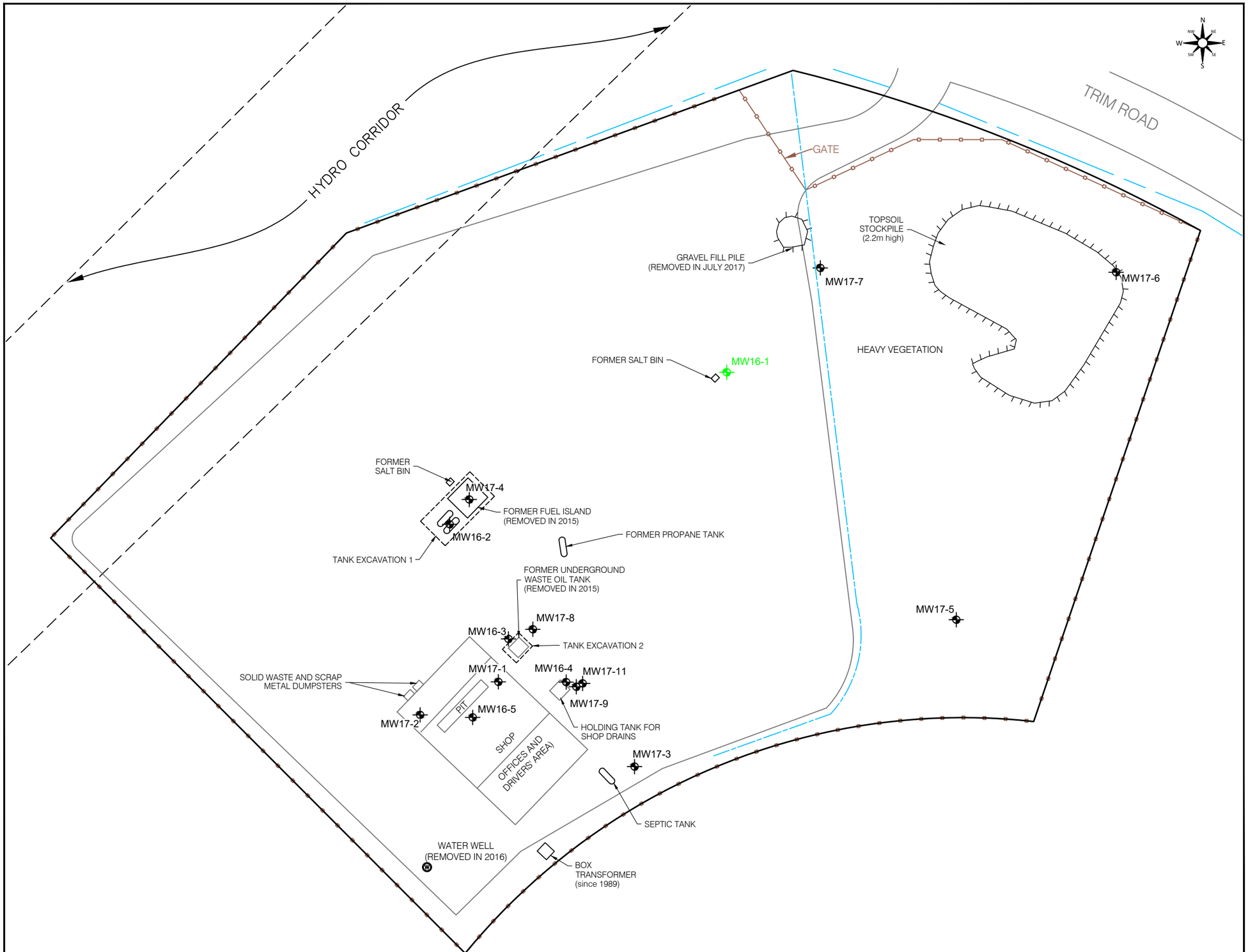
Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 22



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Meets the Applicable SCS for All Analyzed Parameters
- Monitoring Well Not Sampled

Reference: Surveyor's Real Property Report, Fairhall, Moffatt & Woodland Ref # 137-9 Cumberland

10 0 Metres 10 20
1:1000

Title: **GROUNDWATER SAMPLING PLAN AND RESULTS - PESTICIDES AND HERBICIDES**

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 23

A

Southwest

Looking Northwest

A'

Northeast

Inside Shop

Pit

Fence

BH16-6

BH18-2

MW16-5 (1.7 m offset)

Concrete

MW16-3

BH/MW17-8

BH18-3

BH/MW17-11

BH16-11 (12 m offset)

MW16-1

BH16-13 (39 m offset)

BH/MW17-7

SP203 (REMOVED July 2017)

BH16-14 (7.8 m offset)

Fence

At BH16-13: Chromium detected @170ppm (fully delineated)-1.07mbgs

Barium in soil detected at isolated locations (BH16-6, BH16-11, TP16-4, TP16-5, TP16-11) varying from 440-460ppm.

Sandy Gravel Fill

Gravel Fill

Gravelly Sand Fill

Site-wide surficial soil contaminants: Conductivity (5 borehole locations)

Site-wide sub-surficial soil contaminants: Electrical Conductivity (6 borehole locations)

Elevated cobalt & vanadium concentrations inferred as a natural background condition.

Hydraulic conductivity $1x10^{-6}$ to $8.4x10^{-8}$ (native clays)

Borehole Located within Building Footprint

Sand Fill

Clay

Clayey Silt

Sand and Gravel Fill

Elevation (m)

100.0

99.0

98.0

97.0

96.0

95.0

94.0

93.0

BH16-6	
Depth	0.3
EC	0.25
CN	<0.01
Ba	460
Cr	11
Co	6.6
V	9
PHC F3	<50
PHC F4	<50

BH16-6	
Depth	2.74
EC	0.93
CN	<0.01
Ba	280
Cr	120
Co	native
V	native

MW16-5	
Depth	1.07
EC	0.32
CN	<0.01
Ba	200
Cr	21
Co	8.7
V	22
PHC F3	<50
PHC F4	<50

MW16-5	
Depth	4.27
EC	0.24
CN	<0.01
Ba	240
Cr	150
Co	native
V	native

BH16-3	
Depth	3.2
EC	2.5
CN	0.02
Ba	250
Cr	140
Co	native
V	native

BH16-3	
Depth	0.3
EC	0.29
CN	<0.01
Ba	120
Cr	20
Co	5.7
V	18
PHC F3	<50
PHC F4	<50

BH16-11	
Depth	0.76
EC	1.9
CN	<0.01
Ba	440
Cr	11
Co	6
V	8

BH16-11	
Depth	2.9
EC	0.3
CN	<0.01
Ba	360
Cr	130
Co	native
V	native

BH16-1	
Depth	1.22
EC	0.65
CN	0.01
Ba	240
Cr	89
Co	21
V	72
PHC F3	<50
PHC F4	<50

BH16-13	
Depth	1.07
EC	0.81
CN	0.03
Ba	280
Cr	170
Co	native
V	native
PHC F3	<50
PHC F4	<50

BH16-13	
Depth	3.05
EC	0.34
CN	<0.01
Ba	240
Cr	150
Co	native
V	native

	SP203	DUP-6
PHC F3	1400	1900
PHC F4	4600	6300

BH16-14	
Depth	1.07
EC	0.43
CN	<0.01
Ba	370
Cr	140
Co	native
V	native
PHC F3	<50
PHC F4	<50

BH16-14	
Depth	3.35
EC	0.26
CN	<0.01
Ba	230
Cr	160
Co	native
V	native

*only Chlorides and Uranium in groundwater exceed MOECC Table 6 criteria (fully delineated)

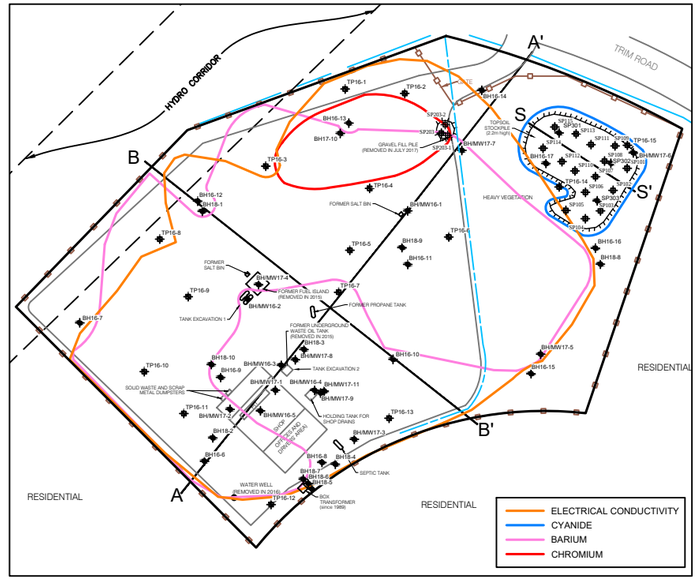
Notes:
- Vertical groundwater gradients range from 0.14 to 0.87. Horizontal groundwater gradients range from 0.01 to $1.97x10^{-4}$
- Soil stratigraphy between and beyond boreholes may vary; saturated Leda clay present beneath entire site
- No sediments present at Phase Two property
- Bedrock not encountered at maximum depth of boreholes advanced (bedrock estimated at 28 to 35m bgs)
- Phase Two property not within 30m of any ANSI or subject to shallow soil/pH requirements under O.Reg 153-04 (as amended)
- Inferred contaminant zones shown are approximate only
- No known presence of preferential pathways
- EC exceeds MOECC Table 6 residential criteria across gravel parking area
- Isolated Barium and Chromium exceedances observed in surficial topsoil only
- Cyanide in soil exceeds at large stockpile only
- F3 & F4 PHCs exceed only at small stockpile (since removed in 2017)
- No soil exceedances observed for PAHs, Pesticides or VOCs
- Site is to be redeveloped for single storey residential homes

0 0.5 1 metres

VERTICAL SCALE 1:30

LEGEND

- BH16-4: BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (February 18, 2016)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- INTERPRETED EXTENT OF SCS EXCEEDANCES FOR METALS PARAMETERS, ASIDE FROM CO + V
- INTERPRETED EXTENT OF EC EXCEEDANCE



0 20 40 metres

HORIZONTAL SCALE 1:1000

Title: **PHASE TWO ESA CONCEPTUAL SITE MODEL**

ARCADIS

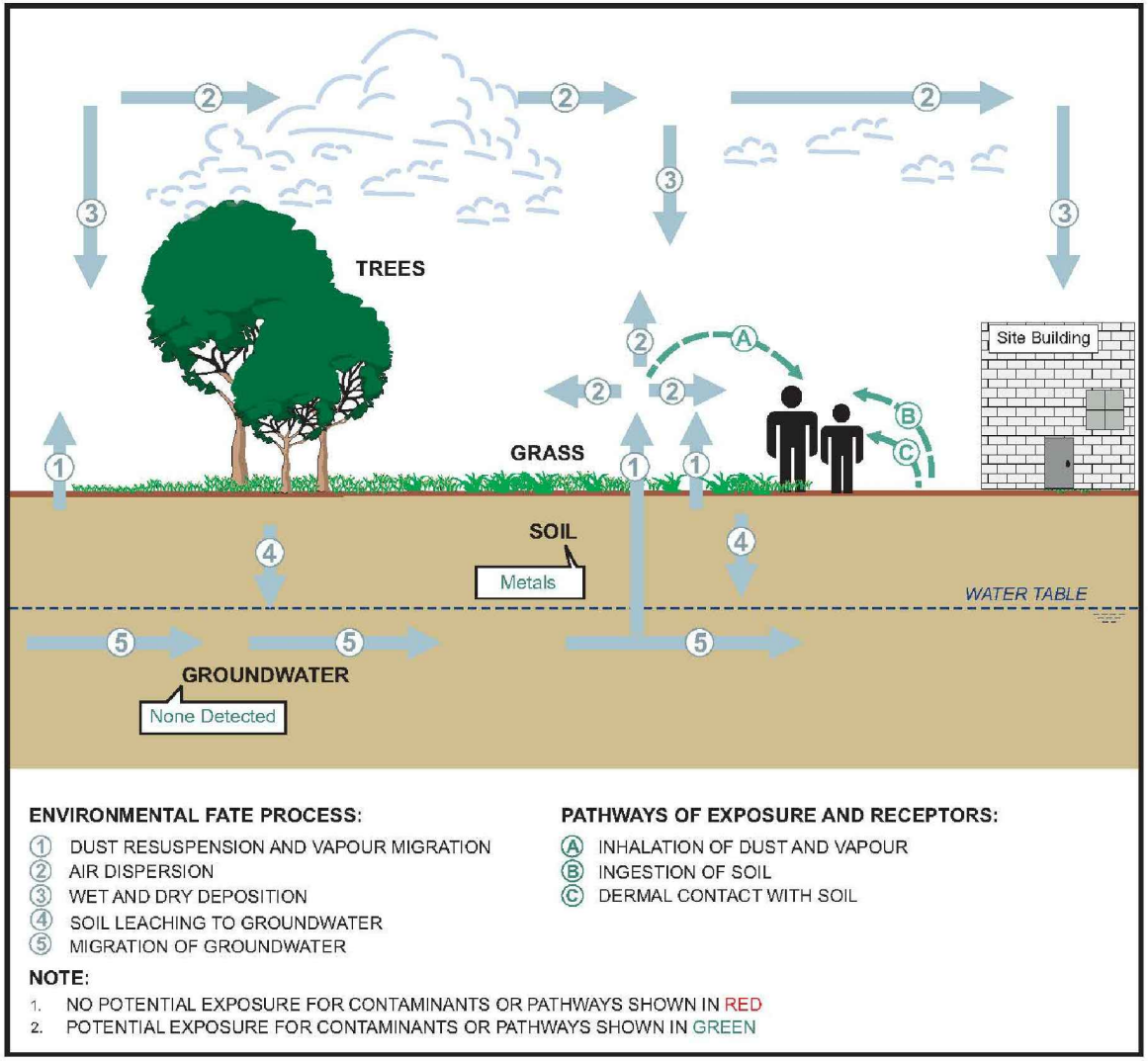
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

FIGURE 24

last saved 16-Nov-18 by dlogan



LEGEND

Title: **CONCEPTUAL SITE MODEL - HUMAN RECEPTORS**

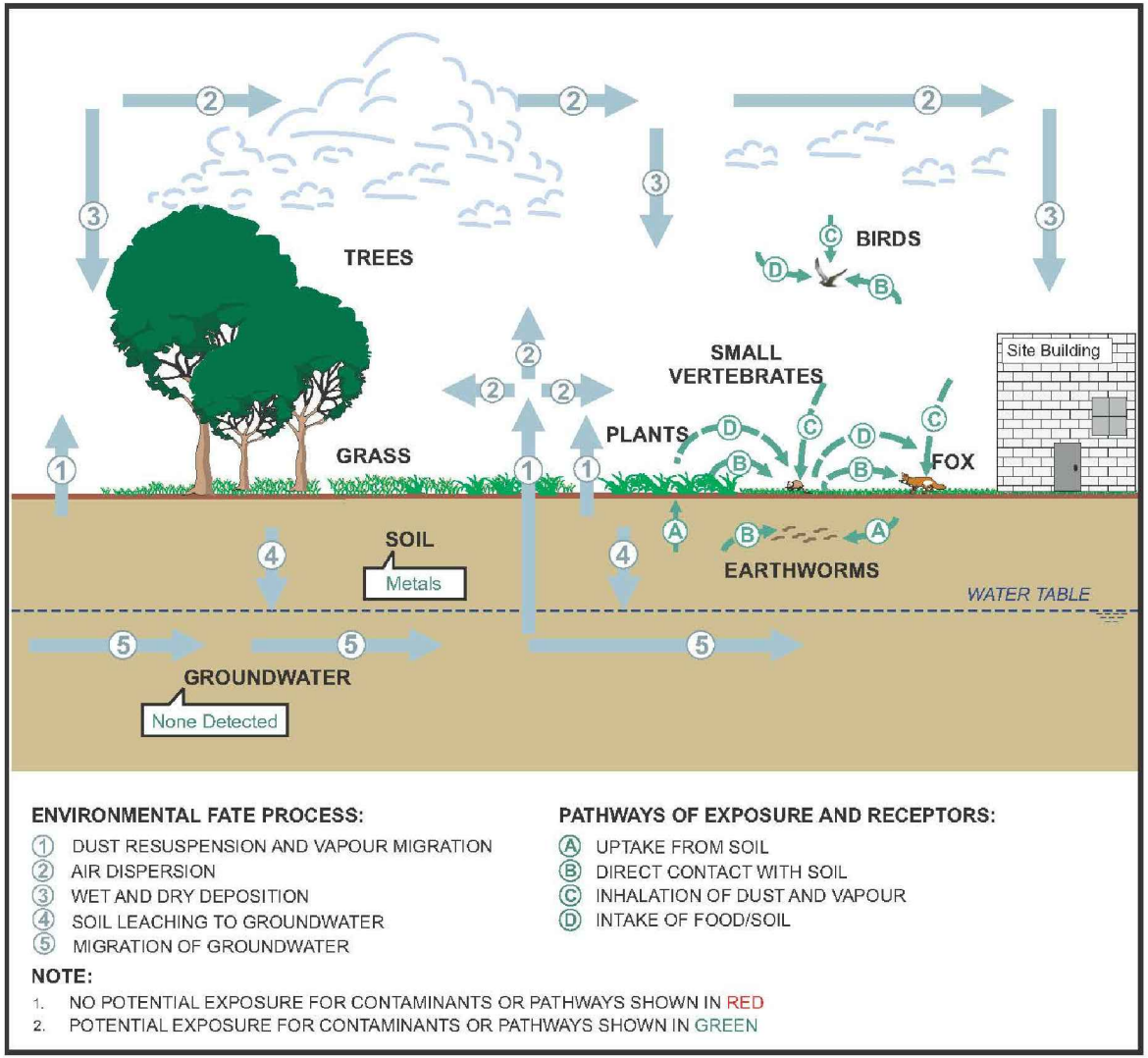
ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

FIGURE 25



LEGEND

Title: **CONCEPTUAL SITE MODEL - ECOLOGICAL RECEPTORS**	
ARCADIS	Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**
Date: **OCTOBER 2018**	Client: **FirstGroup America Inc.**
	FIGURE 26

A

Southwest

A'

Northeast

Inside Shop

Pit

MW16-5 (1.7 m offset)

Fence

BH16-6

BH18-2

Concrete

MW16-3

BH/MW17-11

BH/MW17-8

BH18-3

Ground Surface

BH16-11 (12 m offset)

MW16-1

BH16-13 (39 m offset)

BH/MW17-7

BH16-14 (7.8 m offset)

Fence

Sandy Gravel Fill

Sand Fill

Gravel & Sand Fill

Sand and Gravel Fill

Gravel Fill

Sand Fill

Gravel Fill

Sand and Gravel Fill

Gravel Fill

FILL

NATIVE

Clay

Clayey Silt

Elevation (m)

100.0

99.0

98.0

97.0

96.0

95.0

94.0

93.0

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Conductivity	0.25	0.93

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Conductivity	0.029	2.5

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Conductivity	1.9	0.3

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Conductivity	0.43	0.29	0.26

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Conductivity	0.81	0.34

Sample	BH17-7-1
Depth (mbgs)	0.0 - 0.76
Conductivity	1.14

Sample	BH18-2
Depth (mbgs)	3.5
Conductivity	0.33

Sample	BH18-3
Depth (mbgs)	4
Conductivity	0.63

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Conductivity	0.65	0.24

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Conductivity	0.32	0.24

Borehole Located within Building Footprint

0 0.5 1 metres

VERTICAL SCALE 1:30

LEGEND

BH16-4 BOREHOLE LOCATION

GROUND SURFACE

GROUNDWATER ELEVATION (February 18, 2016)

SCREEN INTERVAL

CLAY

CONCRETE

GRAVEL FILL

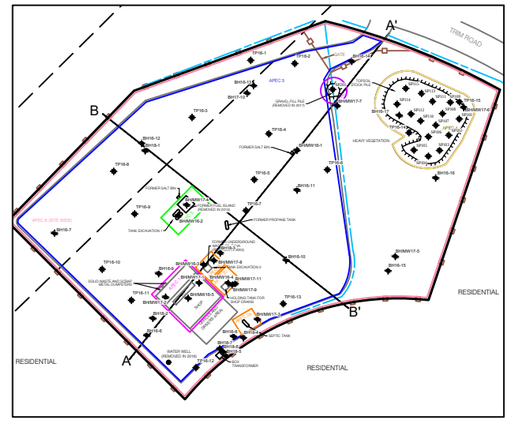
SAND FILL

SILT

EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Conductivity	0.7

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: mS/cm
Note: Residential Land Use applied



Title:

CROSS SECTION A-A' - CONDUCTIVITY

ARCADIS

Project:

ENVIRONMENTAL RISK ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Date:

OCTOBER 2018

Client:

FirstGroup America Inc.

0 20 40 metres

HORIZONTAL SCALE 1:1000

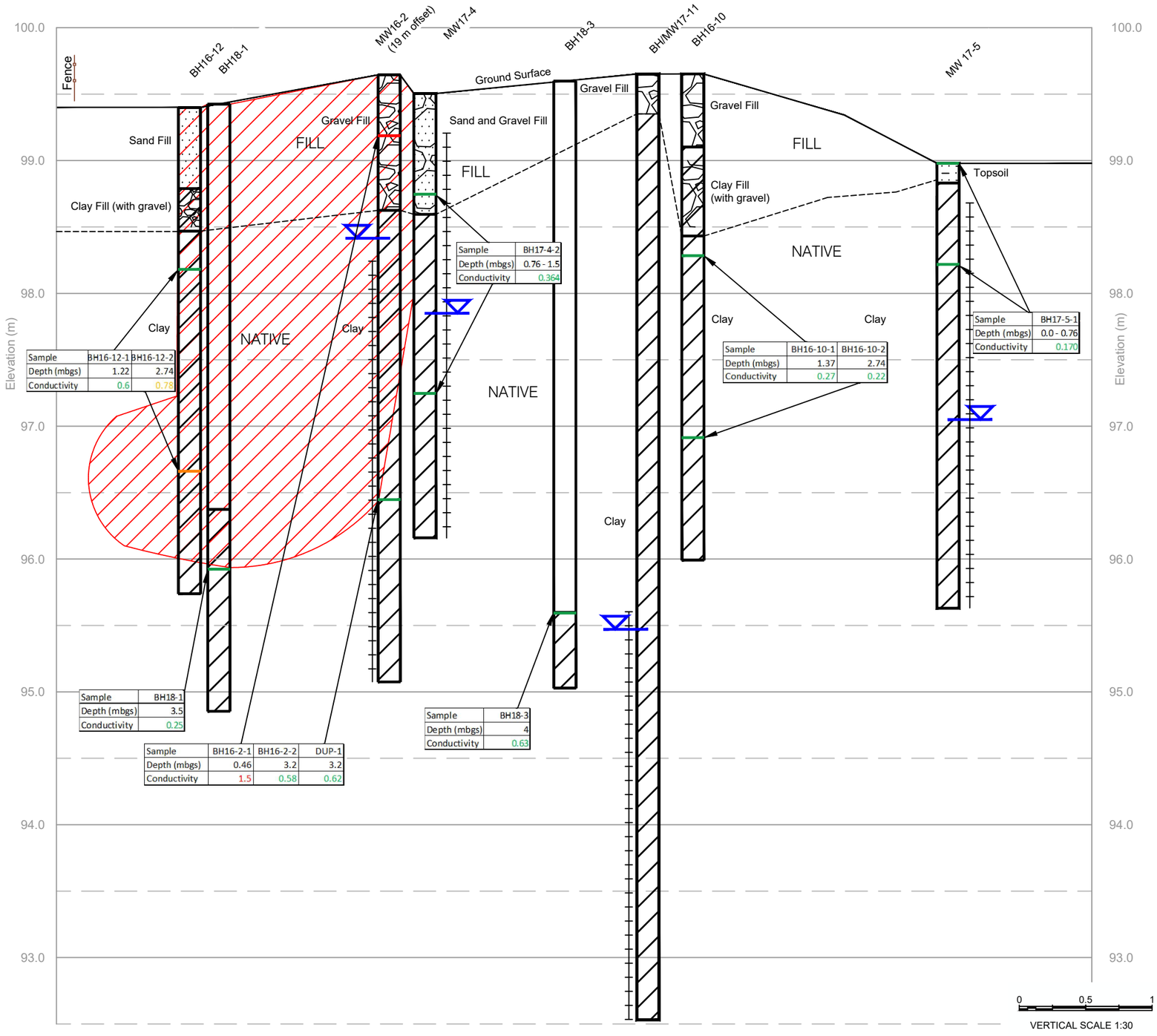
FIGURE 27

B

Northwest

B'

Southeast



0 0.5 1 metres

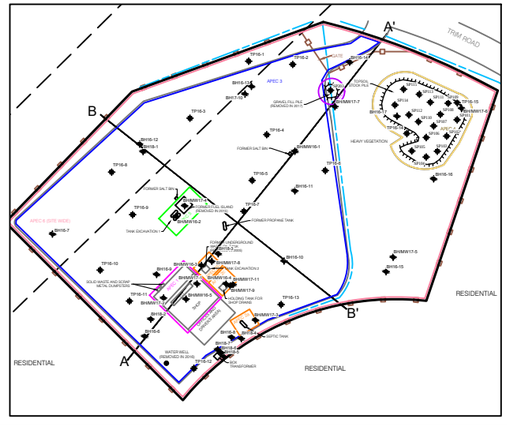
VERTICAL SCALE 1:30

LEGEND

- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (February 18, 2016)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- TOPSOIL/ORGANICS
- EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Conductivity	0.7

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: mS/cm



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

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres

HORIZONTAL SCALE 1:1000

FIGURE 28

A

Southwest

A'

Northeast

Inside Shop

Pit

MW16-5 (1.7 m offset)

MW16-3

BH/MW17-11

BH/MW17-8

BH16-6

Fence

Concrete

Sand Fill

Gravel & Sand Fill

Sandy Gravel Fill

FILL

NATIVE

Clay

Sand and Gravel Fill

Ground Surface

BH16-11 (12 m offset)

MW16-1

BH16-13 (39 m offset)

BH/MW17-7

BH16-14 (7.8 m offset)

Fence

Gravel Fill

Sand Fill

Clayey Silt

Clay

Gravel Fill

Sand and Gravel Fill

FILL

NATIVE

Clay

Gravel Fill

Elevation (m)

100.0

99.0

98.0

97.0

96.0

95.0

94.0

93.0

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Free Cyanide	<0.01	<0.01

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Free Cyanide	<0.01	0.02

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Free Cyanide	<0.01	<0.01

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Free Cyanide	0.03	<0.01

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Free Cyanide	<0.01	<0.01	<0.01

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Free Cyanide	<0.01	<0.01

Borehole Located within Building Footprint

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Free Cyanide	0.01	0.02

0 0.5 1 metres

VERTICAL SCALE 1:30

LEGEND

BH16-4 BOREHOLE LOCATION

GROUND SURFACE

GROUNDWATER ELEVATION (February 18, 2016)

SCREEN INTERVAL

CLAY

CONCRETE

GRAVEL FILL

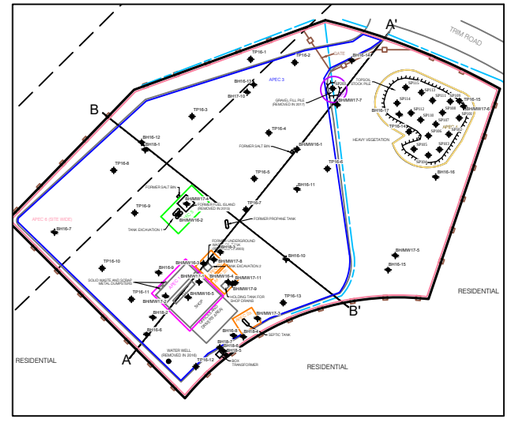
SAND FILL

SILT

EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Free Cyanide	0.051

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: µg/g
Note: Soil exceedances for Cyanide only observed within above-grade topsoil stockpile



Title: **CROSS SECTION A-A' - FREE CYANIDE**

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres

HORIZONTAL SCALE 1:1000

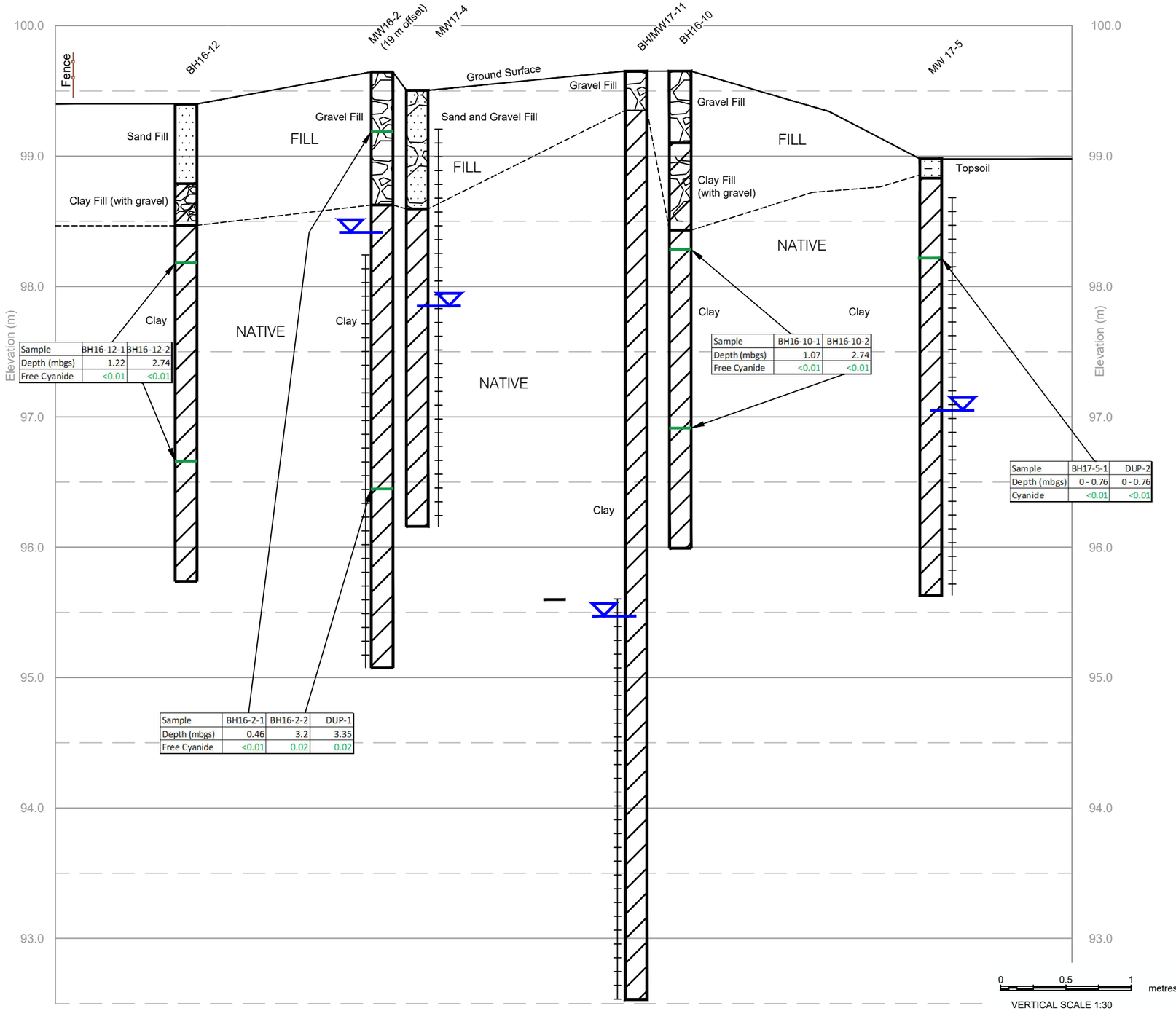
FIGURE 29

B

Northwest

B'

Southeast

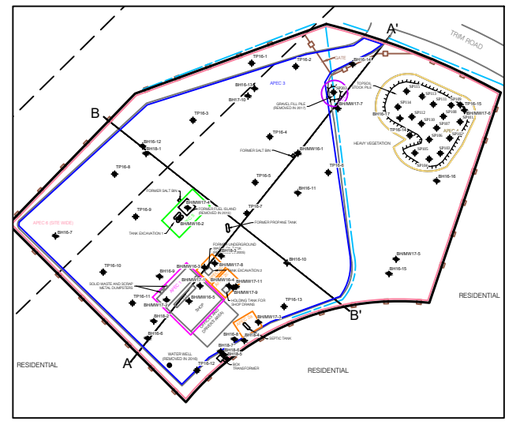


LEGEND

- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (February 18, 2016)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- TOPSOIL/ORGANICS
- EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Free Cyanide	0.051

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: µg/g
Note: Soil exceedances for Cyanide only observed within above-grade topsoil stockpile



Title: **CROSS SECTION B-B' FREE CYANIDE**

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres
HORIZONTAL SCALE 1:1000

FIGURE 30

last saved 16-Nov-18 by dlogan

G:\Projects\2016\450271-000 1830 Trim Road\All Figures\1-CAD\NOVEMBER2018\SUBMITTED\450271-000 Trim Road_RA_ x-sections.dwg

A

Southwest

A'

Northeast

Inside Shop

Pit

MW16-5 (1.7 m offset)

MW16-3

BH/MW17-11

BH/MW17-8

BH16-6

Fence

Concrete

Sand Fill

Gravel & Sand Fill

Sandy Gravel Fill

FILL

NATIVE

Clay

Sand and Gravel Fill

Ground Surface

BH16-11 (12 m offset)

MW16-1

Gravel Fill

Sand Fill

Clayey Silt

BH16-13 (39 m offset)

BH/MW17-7

BH16-14 (7.8 m offset)

Fence

Sand and Gravel Fill

Gravel Fill

Borehole Located within Building Footprint

Elevation (m)

100.0

99.0

98.0

97.0

96.0

95.0

94.0

93.0

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Barium	460	280

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Barium	120	250

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Barium	440	360

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Barium	280	240

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Barium	370	360	230

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Barium	200	240

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Barium	240	270

0 0.5 1 metres

VERTICAL SCALE 1:30

LEGEND

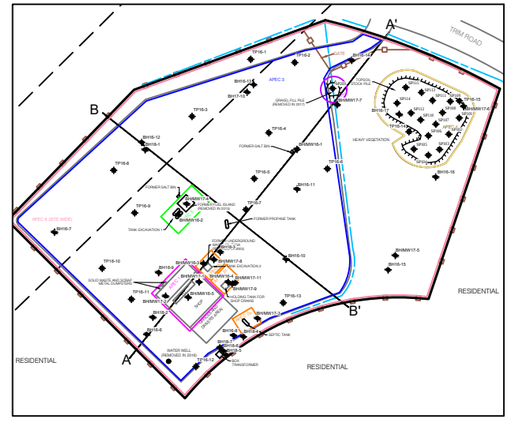
- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (February 18, 2016)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Barium	390

"####" - Red exceeds MOECC SCS standard

"####" - Green below MOECC SCS standard

Units: µg/g



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

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres

HORIZONTAL SCALE 1:1000

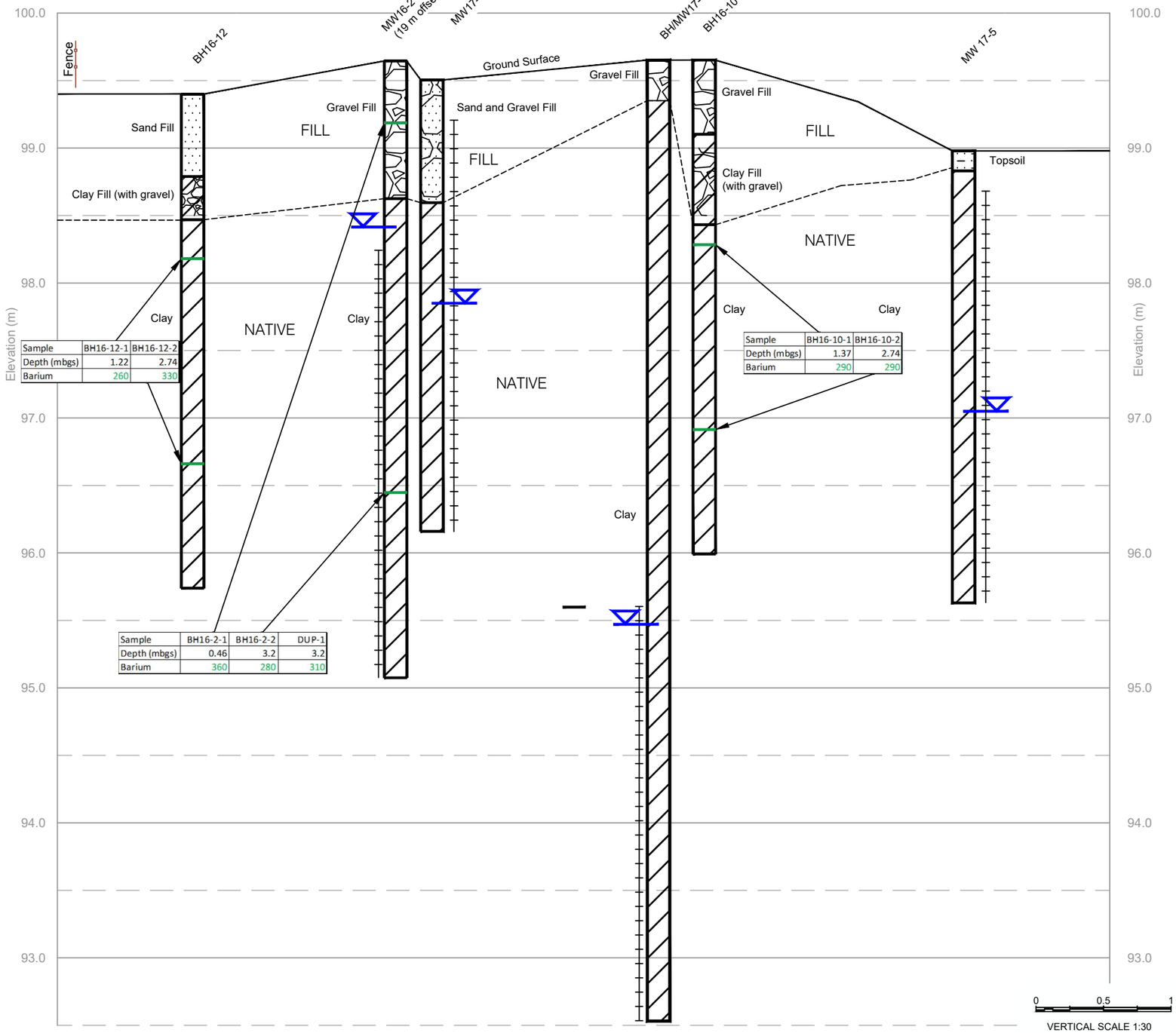
FIGURE 31

B

Northwest

B'

Southeast

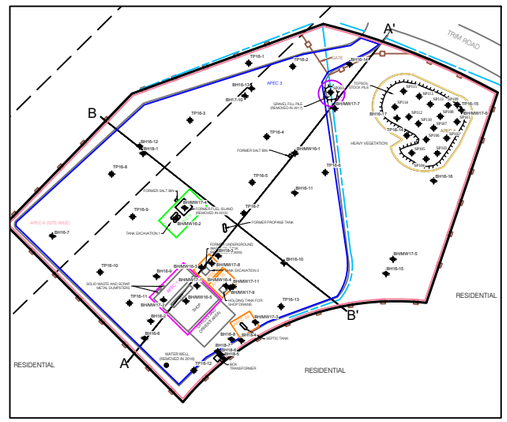


LEGEND

- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (February 18, 2016)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- TOPSOIL/ORGANICS
- EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Barium	390

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: µg/g



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

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres
HORIZONTAL SCALE 1:1000

FIGURE 32

A

Southwest

A'

Northeast

Inside Shop

Pit

MW16-5 (1.7 m offset)

MW16-3

BH/MW17-11

BH/MW17-8

BH16-6

Fence

Concrete

Sand Fill

Gravel & Sand Fill

Sandy Gravel Fill

FILL

NATIVE

Clay

Sand and Gravel Fill

Ground Surface

BH16-11 (12 m offset)

MW16-1

BH16-13 (39 m offset)

BH/MW17-7

BH16-14 (7.8 m offset)

Fence

Gravel Fill

Sand Fill

Clayey Silt

Gravel Fill

Sand and Gravel Fill

Gravel Fill

Clay

Sand Fill

Clay

FILL

NATIVE

Clay

NATIVE

Clay

Clay

Clay

Clay

Borehole Located within Building Footprint

Elevation (m)

100.0

99.0

98.0

97.0

96.0

95.0

94.0

93.0

Sample	BH16-6-1	BH16-6-2
Depth (mbgs)	0.3	2.74
Chromium	11	120

Sample	BH16-3-1	BH16-3-2
Depth (mbgs)	0.3	3.2
Chromium	20	140

Sample	BH16-11-1	BH16-11-2
Depth (mbgs)	0.76	2.9
Chromium	11	130

Sample	BH16-13-1	BH16-13-2
Depth (mbgs)	1.07	3.05
Chromium	170	150

Sample	BH16-14-1	DUP-2	BH16-14-2
Depth (mbgs)	1.07	1.07	3.35
Chromium	140	140	160

Sample	BH16-5-1	BH16-5-2
Depth (mbgs)	1.07	4.27
Chromium	21	150

Sample	BH16-1-1	BH16-1-2
Depth (mbgs)	1.22	3.35
Chromium	89	130

0 0.5 1 metres

VERTICAL SCALE 1:30

LEGEND

BH16-4 — BOREHOLE LOCATION

GROUND SURFACE

GROUNDWATER ELEVATION (February 18, 2016)

SCREEN INTERVAL

CLAY

CONCRETE

GRAVEL FILL

SAND FILL

SILT

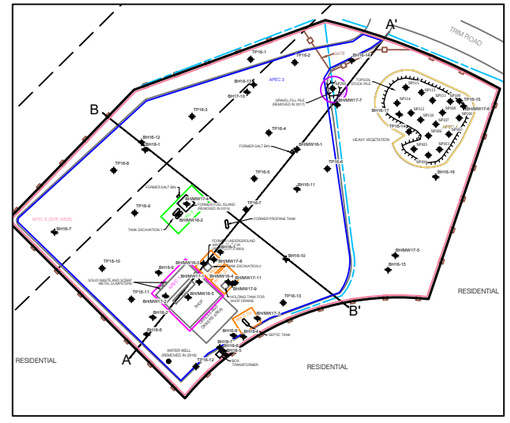
EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Chromium	160

"####" - Red exceeds MOECC SCS standard

"####" - Green below MOECC SCS standard

Units: µg/g



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

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres

HORIZONTAL SCALE 1:1000

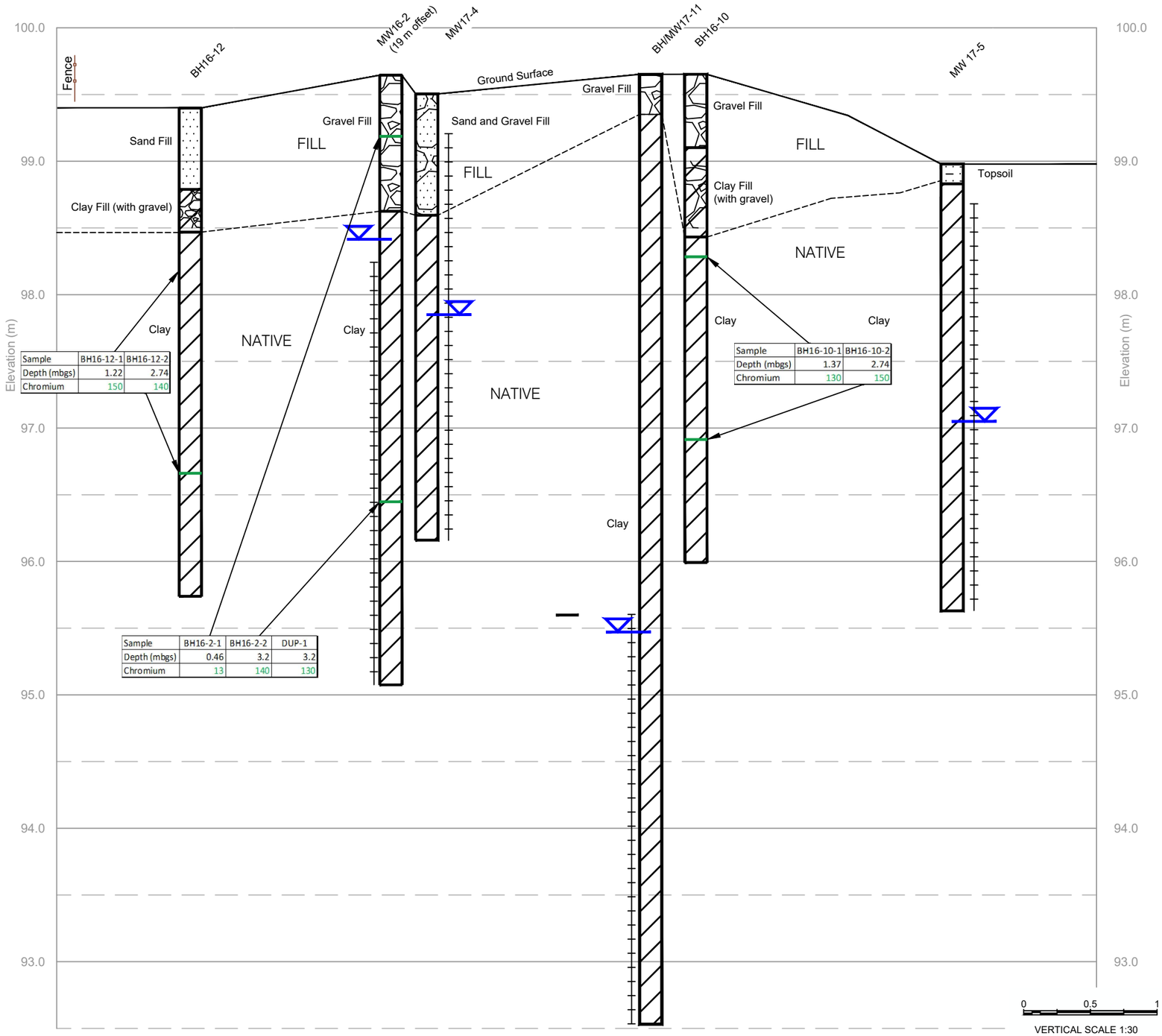
FIGURE 33

B

Northwest

B'

Southeast

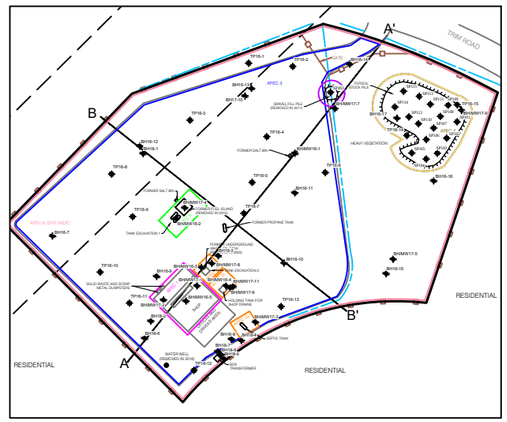


LEGEND

- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (February 18, 2016)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- TOPSOIL/ORGANICS
- EXCEEDS MOECC SCS TABLE 6 STANDARD

Parameter	MOECC Table 6 Site Condition Standard
Chromium	160

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: µg/g



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

ARCADIS

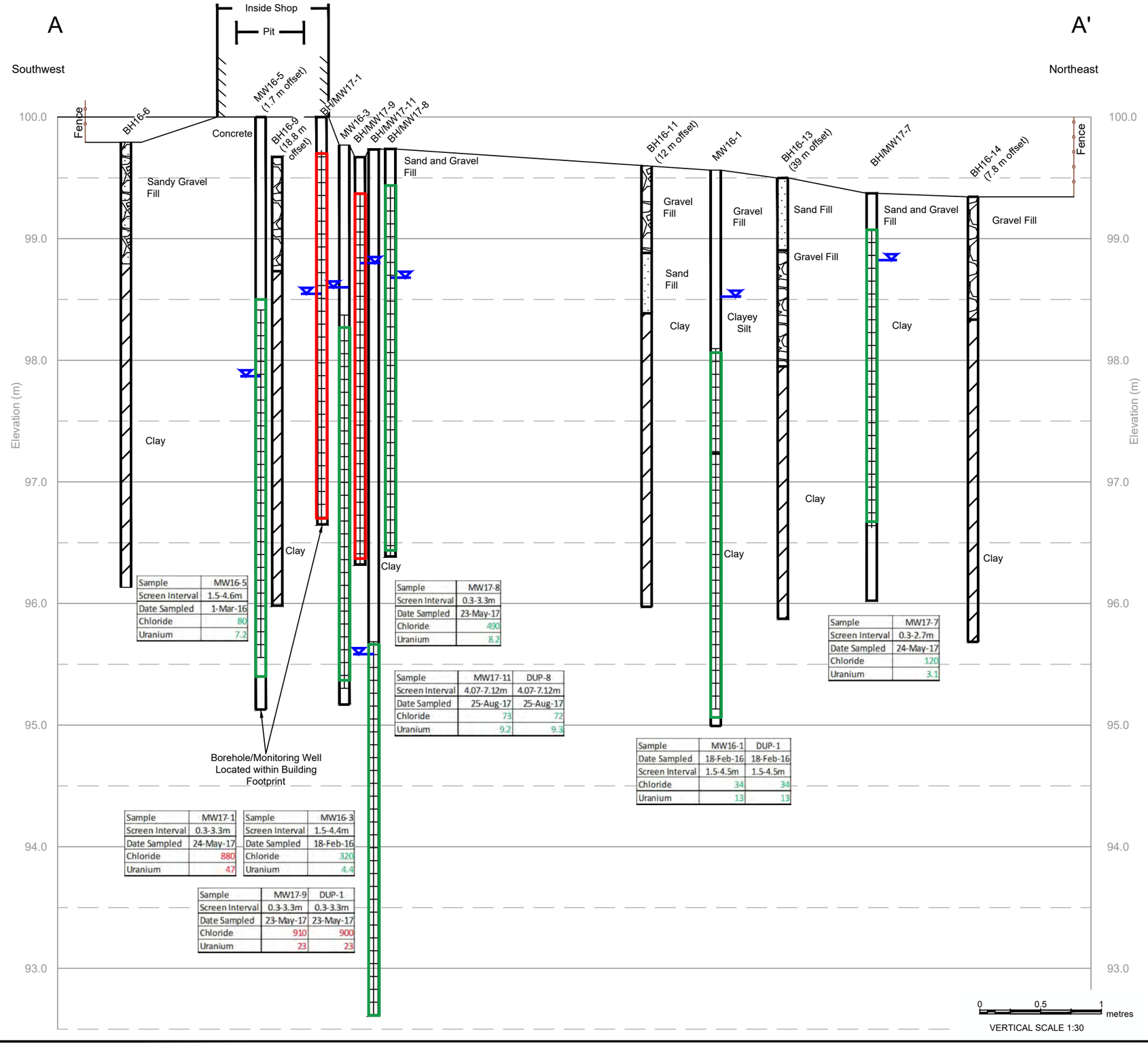
Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres
HORIZONTAL SCALE 1:1000

FIGURE 34



Sample	MW16-5
Screen Interval	1.5-4.6m
Date Sampled	1-Mar-16
Chloride	80
Uranium	7.2

Sample	MW17-8
Screen Interval	0.3-3.3m
Date Sampled	23-May-17
Chloride	490
Uranium	8.2

Sample	MW17-11	DUP-8
Screen Interval	4.07-7.12m	4.07-7.12m
Date Sampled	25-Aug-17	25-Aug-17
Chloride	73	72
Uranium	9.2	9.3

Sample	MW17-7
Screen Interval	0.3-2.7m
Date Sampled	24-May-17
Chloride	120
Uranium	3.1

Sample	MW16-1	DUP-1
Date Sampled	18-Feb-16	18-Feb-16
Screen Interval	1.5-4.5m	1.5-4.5m
Chloride	34	34
Uranium	13	13

Sample	MW17-1
Screen Interval	0.3-3.3m
Date Sampled	24-May-17
Chloride	880
Uranium	47

Sample	MW16-3
Screen Interval	1.5-4.4m
Date Sampled	18-Feb-16
Chloride	320
Uranium	4.4

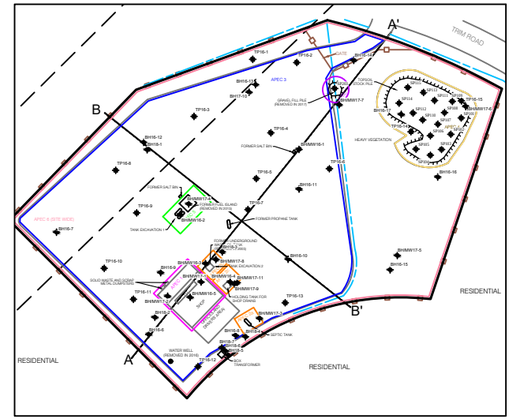
Sample	MW17-9	DUP-1
Screen Interval	0.3-3.3m	0.3-3.3m
Date Sampled	23-May-17	23-May-17
Chloride	910	900
Uranium	23	23

LEGEND

- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (Dates Vary)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- SAMPLE MEETS THE APPLICABLE SCS
- SAMPLE EXCEEDS THE APPLICABLE SCS

Parameter	MOECC Table 6 Site Condition Standard
Chloride	790
Uranium	20

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: Chloride - mg/L, Uranium - µg/L



CROSS SECTION A-A' - CHLORIDE & URANIUM IN GROUNDWATER

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres
HORIZONTAL SCALE 1:1000

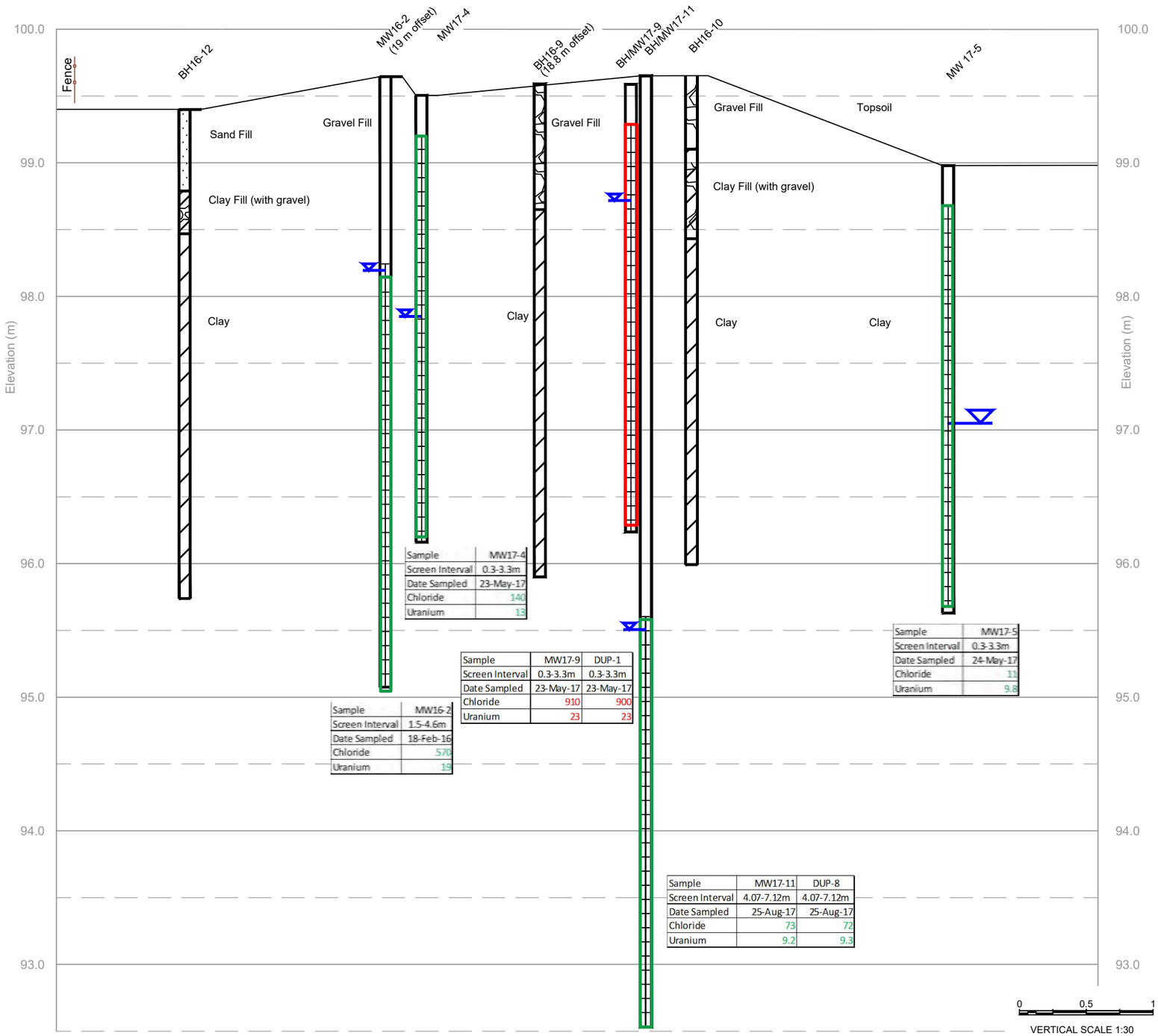
FIGURE 35

B

Northwest

B'

Southeast

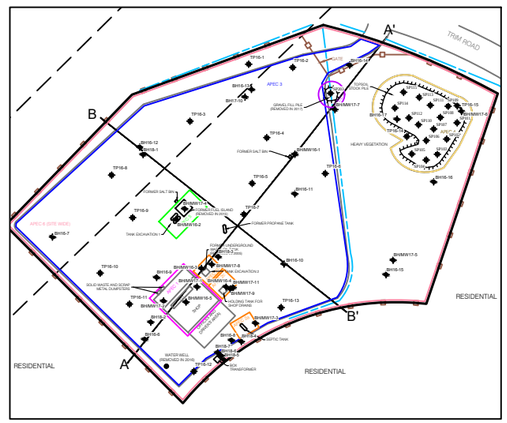


LEGEND

- BH16-4 — BOREHOLE LOCATION
- GROUND SURFACE
- GROUNDWATER ELEVATION (Dates Vary)
- SCREEN INTERVAL
- CLAY
- CONCRETE
- GRAVEL FILL
- SAND FILL
- SILT
- TOPSOIL/ORGANICS
- SAMPLE MEETS THE APPLICABLE SCS
- SAMPLE EXCEEDS THE APPLICABLE SCS

Parameter	MOECC Table 6 Site Condition Standard
Chloride	790
Uranium	20

"####" - Red exceeds MOECC SCS standard
"####" - Green below MOECC SCS standard
Units: Chloride - mg/L, Uranium - µg/L



Title: **CROSS SECTION B-B' - CHLORIDE & URANIUM IN GRWOUNDWATER**

ARCADIS

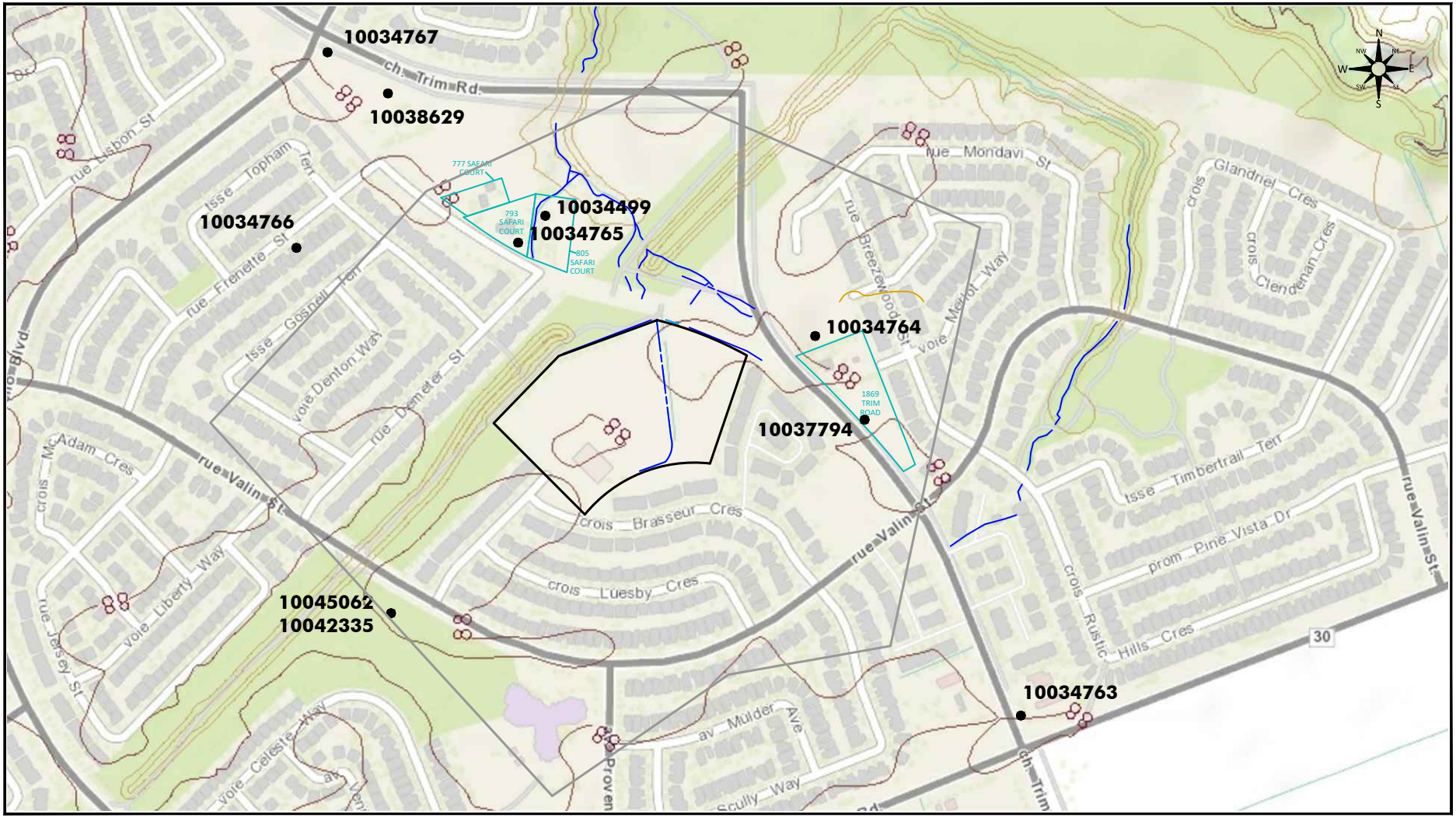
Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Date: **OCTOBER 2018**

Client: **FirstGroup America Inc.**

0 20 40 metres
HORIZONTAL SCALE 1:1000

FIGURE 36



LEGEND

- Site Property Line/Phase One Study Area
- Phase One Study Area
- Off-Site Drinking Water Well Locations
- Topographic Contours - Major
- Topographic Contours - Minor
- Surface Water Bodies
- Ephemeral Streams
- Ontario Groundwater Well

Note: No areas of natural significance found within 250m of subject property boundaries.

Title: **OFF-SITE DRINKING WATER WELL LOCATIONS**

ARCADIS

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Date: **OCTOBER 2018**

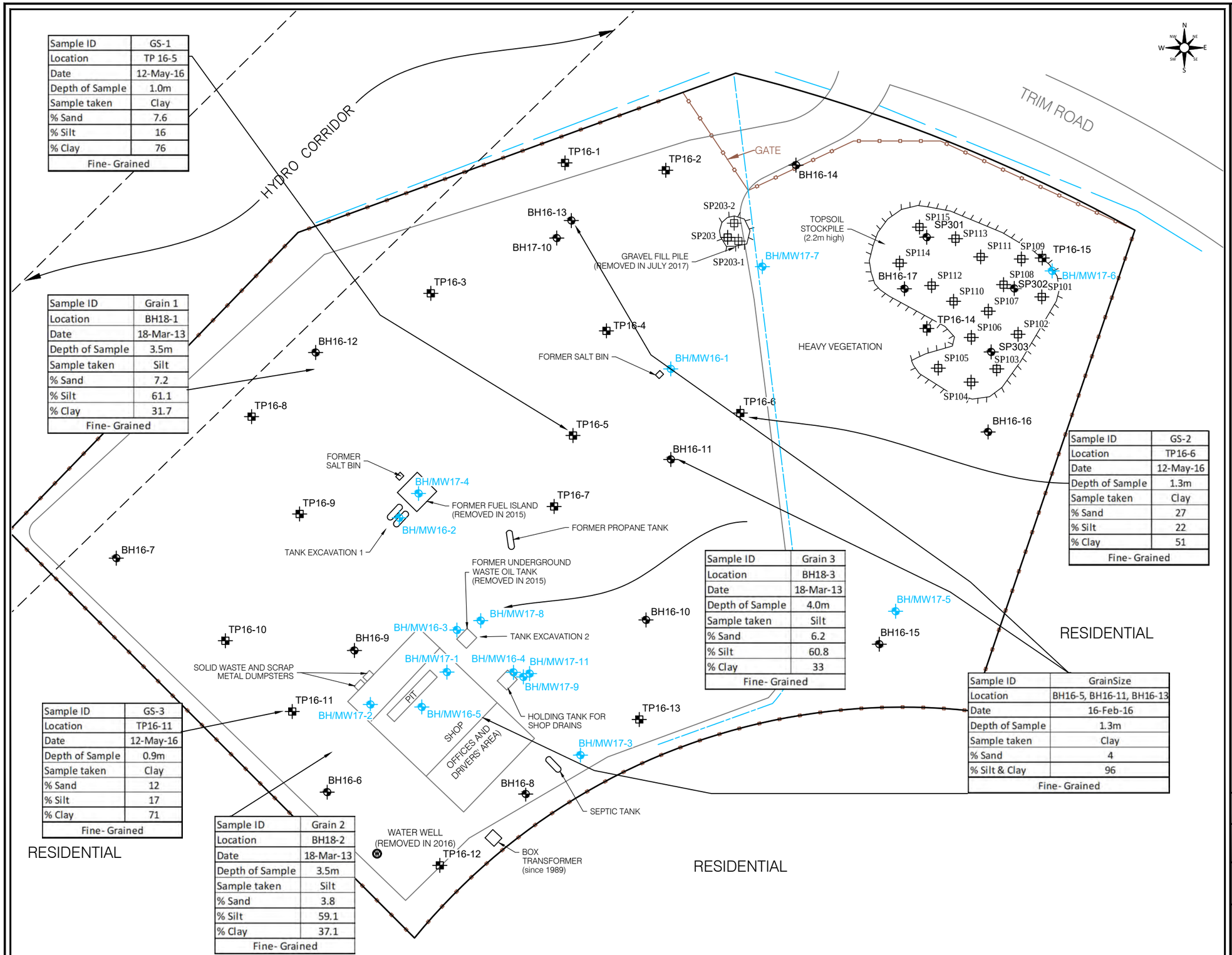
Client: **FirstGroup America Inc.**

Metres
100 0 100 200.0001
1:7000.0019

FIGURE 37

last saved 16-Nov-18 by dlogan

G:\Projects\2016\450271-000 1830 Trim Road\All Figures\1-CAD\NOVEMBER2018\SUBMITTED\450271-000 Trim Road_RA.dwg



Sample ID	GS-1
Location	TP 16-5
Date	12-May-16
Depth of Sample	1.0m
Sample taken	Clay
% Sand	7.6
% Silt	16
% Clay	76
Fine- Grained	

Sample ID	Grain 1
Location	BH18-1
Date	18-Mar-13
Depth of Sample	3.5m
Sample taken	Silt
% Sand	7.2
% Silt	61.1
% Clay	31.7
Fine- Grained	

Sample ID	GS-2
Location	TP16-6
Date	12-May-16
Depth of Sample	1.3m
Sample taken	Clay
% Sand	27
% Silt	22
% Clay	51
Fine- Grained	

Sample ID	Grain 3
Location	BH18-3
Date	18-Mar-13
Depth of Sample	4.0m
Sample taken	Silt
% Sand	6.2
% Silt	60.8
% Clay	33
Fine- Grained	

Sample ID	GS-3
Location	TP16-11
Date	12-May-16
Depth of Sample	0.9m
Sample taken	Clay
% Sand	12
% Silt	17
% Clay	71
Fine- Grained	

Sample ID	Grain 2
Location	BH18-2
Date	18-Mar-13
Depth of Sample	3.5m
Sample taken	Silt
% Sand	3.8
% Silt	59.1
% Clay	37.1
Fine- Grained	

Sample ID	GrainSize
Location	BH16-5, BH16-11, BH16-13
Date	16-Feb-16
Depth of Sample	1.3m
Sample taken	Clay
% Sand	4
% Silt & Clay	96
Fine- Grained	

LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- BH/MW17-1 — Monitoring Well (May & Aug. 2017)
- BH17-10 — Borehole (May 2017)
- TP16-1 — Test Pit (May 2016)
- SP203 — Stockpile Test Pit (May 2016)
- BH/MW16-1 — Monitoring Well (Feb. 2016)
- BH16-6 — Borehole (Feb. 2016)

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

Metres
10 0 10 20
1:1000

Title: **GRAIN SIZE**

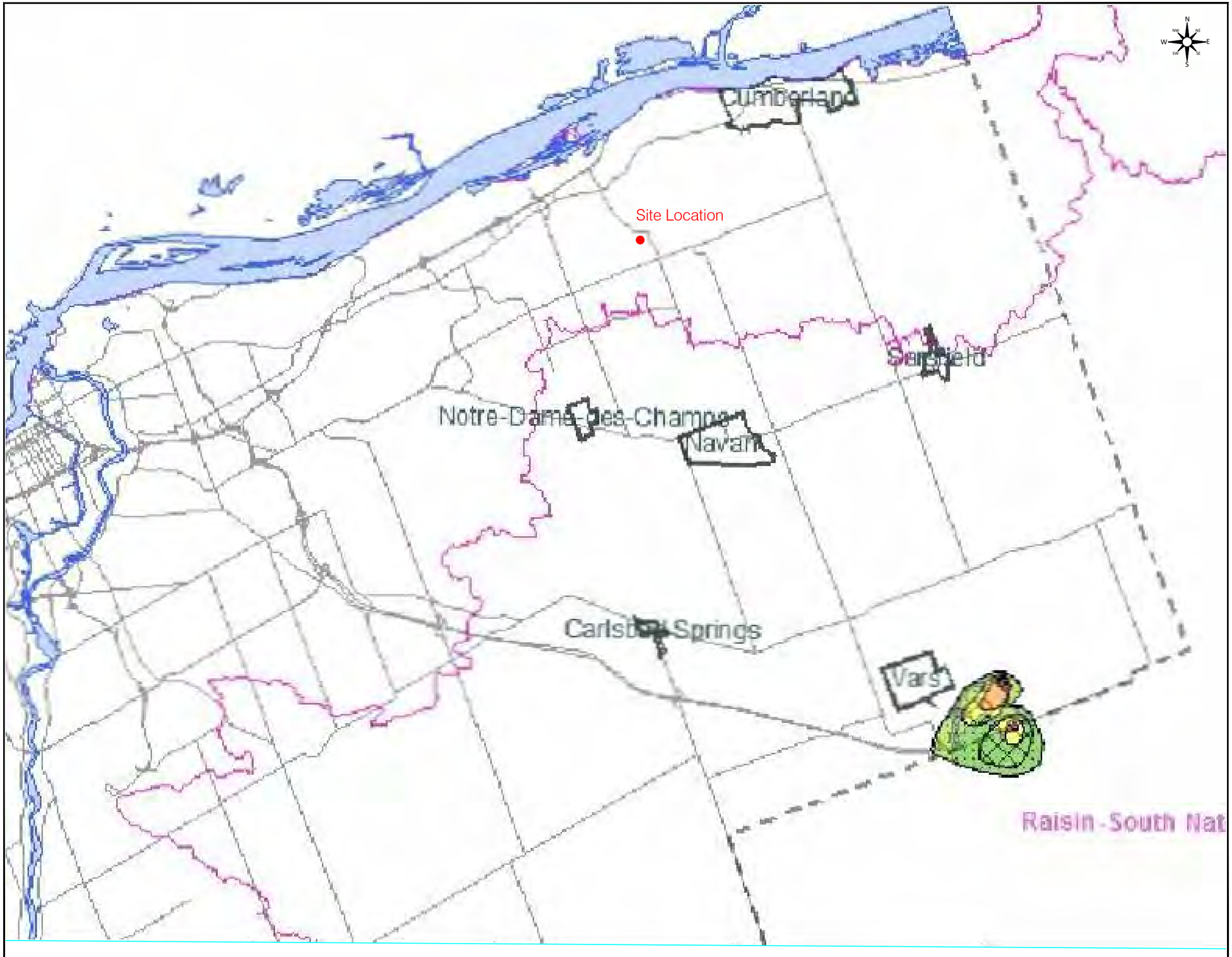
Project: **ENVIRONMENTAL RISK ASSESSMENT**
1830 TRIM ROAD, OTTAWA, ONTARIO

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 38



LEGEND

Vulnerability Score

- 2
- 4
- 6
- 8
- 10

- IPZ-1 (Score 9)
- IPZ-2 (Score 8.1)
- Water / Eau
- Village Boundaries / Limite du village
- City Boundary / Limite de la Ville d'Ottawa

Reference: http://ottawa.ca/en/residents/water-and-environment/air-land-and-water/source-water-protection

Metres 1000 0 1000 2000 1:115000

Title: **Source Protection Area Map**

Project: **ENVIRONMENTAL RISK ASSESSMENT 1830 TRIM ROAD, OTTAWA, ONTARIO**

Client: **FirstGroup America Inc.**

ARCADIS

Date: **OCTOBER 2018**

FIGURE 39

10 USE AND LIMITATIONS OF THIS PHASE TWO ESA REPORT

This report, prepared for FirstGroup America, Inc., does not provide certification or warranty, expressed or implied, that the investigation conducted by Arcadis uncovered all potential contaminants of environmental concern at the Site. The work undertaken by Arcadis was directed to provide information on potential contamination that might have accrued from its historic use. Based on the results of the investigation, Arcadis found some evidence of chemical parameters in concentrations exceeding the evaluation criteria selected for the Site. The test data, chemical analyses and conclusions given in the reports, however, are the result of the sampling of subsoils and ground water encountered during the program, and based upon the total number of boreholes and monitoring wells performed, are considered to fairly represent the subsurface conditions within each area tested. It should be noted, however, that any assessment regarding the presence of contamination at the Site is based on interpretation of conditions determined at specific locations and depths. This assessment cannot warrant that other isolated pockets of contaminated soils are not located on the Site. Chemical parameters were chosen based on potential contamination sources and, therefore, results are limited to those parameters tested.

Further, the report was prepared by Arcadis for FirstGroup America, Inc. The material in it reflects Arcadis' best judgement in light of the information available at the time of preparation, in February 2019. Changes to soil and/or ground water quality in the areas investigated can occur following the date of testing. Any use which a third party makes of the report, or reliance on, or decisions to be based on it, is the responsibility of such third parties.

APPENDIX A

Sampling and Analysis Plans

Privileged and Confidential

Susan Kirkpatrick
Environmental Program Manager
FirstGroup America Inc.
600 Vine Street, Suite 1400
Cincinnati, OH 45202

ARCADIS Canada Inc.
121 Granton Drive
Unit 11
Richmond Hill
Ontario L4B 3N4
Tel 905 882 5984
Fax 905 882 8962
www.arcadis.com

Subject:
Sampling and Analysis Plan
-1830 Trim Road property, Ottawa, Ontario

ENVIRONMENT

Date:
February 4, 2016

Contact:
Troy Austrins

Email:
troy.austrins@
arcadis.com

Our ref:
450271-000

Dear Ms. Kirkpatrick:

Further to our proposal dated December 18, 2015, we are pleased to submit a Sampling and Analysis Plan for the Phase II Environmental Site Assessment (ESA) at 1830 Trim Road in Ottawa, Ontario.

Until recently, the site at 1830 Trim Road was used for school bus parking and as a school bus maintenance garage. The parcel is owned by First Canada, but is currently for sale. The site was serviced by 1) two former 45,500 L diesel underground storage tanks (USTs), 2) a 2,270 L waste oil UST, 3) a holding tank for maintenance shop drains, 4) an interior bus garage wash bay, 5) an interior maintenance pit, 6) two 1,130 L motor oil aboveground storage tanks (ASTs), 7) one 1,130 L automatic transmission fluid (ATF) AST, 8) one windshield washer fluid AST, and 9) new and used antifreeze and grease and gear oil storage drums. The site utilizes an onsite water well and septic. The two 45,500 L diesel USTs were removed in July 2015, where contaminated soil was excavated. Post-excavation sample results detected exceedances of cobalt and vanadium. FirstGroup intends to obtain a Record of Site Condition (RSC) for the property to facilitate its sale. Therefore, the goal for this site is to file an RSC and obtain Ministry of the Environment and Climate Change (MOECC) sign off.

For the Phase II ESA, Arcadis Canada Inc. (Arcadis) will advance approximately 17 boreholes (including installation of a minimum of five monitoring wells) to investigate potentially-contaminating activities (PCAs) and areas of potential environmental concern (APECs) noted during the Phase I ESA. This will provide

the information necessary to complete the environmental reporting as well as the Record of Site Condition (RSC) application.

Based on information provided by FirstGroup America Inc. (FirstGroup), PCAs and APECs that will require assessment as part of an O. Reg. 153/04 compliant Phase II ESA program include:

- The former presence of two 45,500 L diesel fuel USTs and a fuel pump island centrally located on the property;
- The former presence of a 2,270 L waste oil UST situated adjacent to the exterior north-east corner of the garage building;
- The presence of a holding tank for maintenance shop drains situated near the south east corner of the garage building;
- Bus maintenance operations within the garage building including the presence of a maintenance pit at the north end of the building and AST's and storage drums for oil, waste oil, windshield washer fluids, antifreeze, grease and gear oil throughout the garage building;
- Potential historical use of the property and surrounding lands for Agricultural purposes; and
- Fill soils present on the property.

These PCAs and APECs may have affected:

- groundwater in overburden that may have been contaminated from spills/losses from historic USTs on the property or during bus maintenance work;
- possible contamination in fill soils at the site. Fill material was observed to extend from surface to depths of between 0.6 to 0.9 m bgs across the tank removal excavation areas. A potential fill stockpile is also visible in satellite imagery at the north east corner of the property;
- possible contamination in native overburden underlying the site from spills/losses during bus maintenance work and by pesticides from historical agricultural use.

However, a review of the cobalt and vanadium concentrations reported by Strata for the native clay samples indicates that they meet the MOECC Table 5 Stratified Site Condition Standards (SCS) for sub-surface soils (soils situated below 1.5 m from ground surface) for RPI land use in a non-potable groundwater condition. It may be possible to file a RSC if the Phase II ESA program shows that these SCS are acceptable for use at the site and that the following conditions are met:

- Surface soils (within 1.5 m bgs) meet the Table 5 surface soil SCS (These are the same as the Table 3 SCS);
- Sub-surface soils meet the Table 5 Sub-surface soil SCS; and that
- Groundwater conditions meet the Table 5 SCS (these are the same as the Table 3 SCS);

If all the above conditions are met, it may be possible to file an RSC for the property for acknowledgement by the MOECC using a stratified approach following completion of the O. Reg. 153/04 compliant Phase I and II ESAs. As such, our proposed sub-surface investigation calls for a number of shallow boreholes to be across the property to characterize soil quality in the upper 1.5 m of the site.

If the Phase II ESA shows that the Table 5 SCS are not applicable to the site and that soil and/or groundwater conditions exceed the SCS that are determined to be applicable to the site, either a remediation program to remove the soil and/or groundwater contamination from the property or a risk assessment will be required to be completed prior to filing an RSC for the property with the MOECC.

IMPLEMENTATION OF SAMPLING AND ANALYTICAL PROGRAM

Arcadis will advance approximately 17 boreholes (including installation of a minimum of five monitoring wells) to investigate PCAs and APECs noted during the Phase I ESA. The goal of the borehole and well installations is to provide details of soil and groundwater quality, with particular attention to soil in the top 1.5 m.

A review of background documents and preliminary analysis of the site has been conducted (a summary provided in Arcadis proposal).

Prior to drilling operations, Arcadis will complete locates using the services of Ontario One Call and a private locator to determine the location of all underground services on the property.

The locations of the boreholes and monitoring wells will be measured to existing site features and with GPS coordinates obtained for each locations. The attached draft site plan shows the proposed borehole locations. The rationale for each borehole location is provided in Table 1 (also attached). The rationale for borehole locations was based on a judgmental system following from review of the Phase I ESA APECs. An outline of sampling media, number of samples, sampling points, depth intervals, is provided on Table 1 (Borehole Rationale).

Other field information to be obtained includes water levels, all field measurements, and elevation surveying of borehole and monitoring well locations.

The Phase II ESA work will be conducted in accordance with Part VIII -Phase II ESA and Schedule E of the revised Brownfield Regulation (i.e. O. Reg. 511/09).

The work program is scheduled to begin on February 9, 2016. Arcadis staff will backfill boreholes following drilling operations.

COLLECTION AND HANDLING OF SOIL SAMPLES

Advancement of the boreholes and construction of monitoring wells will be supervised on a full time basis by Arcadis personnel. Soil samples will be recovered from both the surface soil (up to 1.5 m below ground surface (bgs)) and the subsurface soils (below 1.5 m bgs). During monitoring well installations, soil samples will be collected in the same manner (i.e. one sample from the surface soil and one from the subsurface soil). Surface and subsurface soil samples will be collected from different layers of material (i.e. surface soil will likely be fill material, subsurface soil will likely be native clay material).

Samples will be visually characterized and logged in the field. Each collected sample will be split in half, with one half of the sample placed in a clean glass jar for future analysis. The remainder of the sample will be used for soil vapour screening and then archived.

It is estimated that a total of 34 soil samples will be taken as well as at least three duplicate samples for quality assurance/quality control (QA/QC) purposes. Soil sampling procedures will be conducted as outlined in O.Reg 511/09 and in accordance with the MOECC's *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*. Soil samples, for purposes of volatile organic compounds (VOCs), benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbon compounds (PHCs) F1 analyses, will be collected using specialized methanol preservation.

Following visual and olfactory characterization, each soil sample will be split and half of the soil placed into a dedicated, laboratory supplied sample container and the other half placed into a plastic bag, sealed with nominal headspace, and labelled with the sample identified. Headspace vapour readings will then be taken and recorded for each bagged soil sample using a RKI Eagle, a portable hydrocarbon vapour detector, with dual sensors and operated in methane

elimination mode. Subsurface conditions encountered in the borehole will be logged at the time of the investigation.

Samples destined for laboratory analysis will be placed on ice in a cooler, kept at temperature of approximately 4 °C and delivered promptly to the laboratory upon completion of the field investigation under a chain of custody. Soil samples will be analyzed for one of more of the following:

- Metals and inorganics;
- Polycyclic aromatic hydrocarbons (PAHs);
- PHCs fractions F1 to F4;
- VOCs; and
- Pesticides.

Samples to be submitted for laboratory analyses will be chosen based on the presence of staining, odours, elevated soil vapour readings and to be representative of the upper 1.5 m as well as varying soil stratigraphy.

GROUNDWATER MONITORING AND SAMPLE COLLECTION

Groundwater samples will be described qualitatively. Field measurements of surface elevation, groundwater elevation, depth to bottom of screen, temperature, pH, conductivity, turbidity and GPS locations will be recorded. Water levels and the presence or absence of light non-aqueous phase liquids and dense non-aqueous phase liquids will be measured using an interface probe.

Groundwater wells installed on the site will comprise 2” ID PVC pipe. All reasonable attempts will be made to install the well screen such that it straddles the groundwater table, thereby determining if free product is present. However, if the groundwater table is shallow (i.e. less than 0.5 m bgs), the regulations regarding construction of monitoring wells (O. Reg. 903) may preclude this possibility.

Reference elevations for all the monitoring wells will be surveyed relative to a temporary benchmark.

Prior to groundwater sampling from the newly installed monitoring wells, a minimum of three well volumes of water will be purged from each monitoring well, or the wells will be purged dry and allowed to recover, to ensure that representative groundwater samples are recovered. The wells will be purged using dedicated polyethylene tubing equipped with a Waterra-type foot valve. Each well will be

instrumented with dedicated sampling equipment such as “Waterra” pumps and bailers, as appropriate, which will not be moved from one monitoring well to the next, so as to minimize the risk of cross-contamination.

Groundwater samples will be collected using low-flow techniques, to minimize sediment in sample bottles.

One groundwater sample from each monitoring well installed during this investigation will be obtained and submitted to an independent CALA-accredited laboratory (Maxxam Analytics) for analysis of one or more of the following parameters:

- Metals and inorganics;
- PAHs;
- PHC F1 to F4;
- VOCs; and
- Pesticides.

Field blind duplicates will be secured for QA/QC purposes of up to 10% of the original sampling quantities for soil and groundwater. A trip blank will be used for purposes of the groundwater sampling program.

PHYSICAL IMPEDIMENTS

As the field work for this Phase II ESA is being conducted under winter conditions, there may be impediments in collection of surface soils due to frozen conditions and difficulties in collecting groundwater samples and keeping them from sub-zero temperature conditions.

QUALITY ASSURANCE & QUALITY CONTROL

Field blind duplicate samples will be secured for QA/QC purposes from both the soil and groundwater sampling programs. Up to 10% of the original sampling quantities for soil and groundwater will comprise field blind duplicates. A trip blank will be used for purposes of the groundwater sampling program.

Soil, and groundwater samples will be retrieved in the field in adherence to Arcadis’ Standard Field Sampling Procedures which were developed in accordance with the sampling procedures as outlined in O.Reg 511/09 and in accordance with the

MOECC's *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*.

All non-dedicated sampling and monitoring equipment will be cleaned following each use.

Where groundwater samples are to be analyzed for VOCs, one trip blank shall be submitted for laboratory analysis with each laboratory submission.

Calibration checks will be undertaken on all field instruments.

All soil, and groundwater samples will be submitted to the testing laboratory via a Chain Of Custody record documenting the time and date the sample was collected, the requested analysis, and the time, date and temperature the samples arrived at the laboratory. Coolers will be dropped off or picked up by the laboratory using custody seals.

As for data quality objectives, Relative Percent Difference (RPD) values will be calculated on all duplicate sampling. The RPD values for homogeneous samples are generally considered acceptable in laboratory QC if they are generally less than 30% for water and less than 50% for soils (MOE, March 2004). However, due to different conditions encountered in the field, the acceptance limits for RPD in field QC are often broader. A soil RPD alert value of 80% will be applied to this site, as applicable to heterogeneous shallow surface soils, while a value of 50% will be applied to the groundwater sampling program.

The data quality objectives for all types of field data collected during the Phase II ESA field investigation shall be such that the decision-making is not affected and that overall objectives of the investigation are met.

Standard operating procedures have been developed by Arcadis to cover various aspects of the field investigation, including: borehole drilling, soil sampling, field screening, monitoring well installations and development, field measurement for water quality indicators, and ground water sampling.

LABORATORY ANALYTICAL PROGRAM

Soil and groundwater samples recovered from the boreholes and monitoring wells will be submitted to Maxxam Analytics Inc. of Ottawa, Ontario for chemical analysis.

To investigate the presence of previously-identified contaminants of concern, soil and groundwater samples will be analyzed for one or more of the following:

- Metals and inorganics;
- PAHs;
- PHC F1 to F4;
- VOCs; and
- Pesticides.

The proposed analytical program is presented in Table 1 (Borehole Rationale), attached to this letter.

Given the stratified conditions at the site, it is anticipated that the applicable reference criteria would be the 2009 Table 5 Stratified Site Conditions Standards in a Non-Potable Groundwater Condition. There is one water well on the property, but the site planned for demolition and it is likely future buildings will be serviced by the municipal water supply. The land use is currently commercial, but, as filing of an RSC is proposed, results will be compared to guidelines for both commercial and residential land uses.

MANAGEMENT OF SOIL CUTTINGS AND PURGED GROUNDWATER

Arcadis has planned for the off-site removal and disposal of generated borehole cuttings and purge water. Collected purge water will be drummed awaiting arrangement for disposal and evaluation of laboratory testing results. If current groundwater standards are met, purge water will be collected and disposed of by Drain-All of Ottawa, a licensed hauler of liquid water.

Borehole cuttings will be reviewed for impact prior to drumming. If no elevated petroleum hydrocarbon vapours are detected by field screening methods in the soil cuttings, they may then be left on-site. If hydrocarbon impacts are noted in the field, cuttings will be placed in a drum. Disposal of cuttings will occur at a MOECC-licensed landfill.

REPORTING

The final Phase II ESA report will include a primary figure that shows the property boundaries, the location of significant structures and the locations of on- and off-

site issues examined during the Phase II ESA. Additional figures will show groundwater elevation contours, areas impacted by contaminants and delineation of contaminants (if possible). All figures will be to scale, with borehole/monitoring well locations measured using GPS co-ordinates references to 17T NAD83. All reporting will be prepared and signed by a Qualified Person, as defined in O. Reg. 153/04 as amended by O. Reg. 511/09.

CLOSURE

A consideration by the QP of findings about PCAs, all contaminants of potential concern or appropriate subsets of them, and any other information and matters relating to the environmental condition of the property that are relevant to an informed professional judgment, was undertaken.

Following sample acquisition, the QP will determine the sampling and analysis for all contaminants of potential concern or appropriate subsets of them, and appropriate sampling and analysis for any other relevant contaminants.

We trust this Sampling and Analysis Plan is sufficient for the current purposes. Should you have any questions, do not hesitate to contact the undersigned.

Sincerely,

Arcadis Canada Inc.

Troy Austins, P.Eng., QP_{ESA}
Project Manager

Enclosures:

Tables

1 Borehole Rationale for Environmental Assessment

Figures

1 Proposed Borehole Locations

TABLE 1

BOREHOLE RATIONALE FOR ENVIRONMENTAL ASSESSMENT

Borehole ID	Location	Monitoring Well Installed Y/N	Estimated BH Depth (mbgs)	Screen Interval (mbgs)	Rationale	Laboratory Testing Program			
						Stratum	Soil Samples	Aquifer	Groundwater Samples
MW16-1	Centre of Site	Y	4.5	1.5-4.5 m	Borhole to assess fill quality and upper native soil conditions. Monitoring well to be installed to allow for characterization of groundwater flow in the native clay aquifer at the site.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (2) PHC F1-F4/VOC (2)	Clay	Metals and Inorganics (1) PAH (1) PHC F1-F4/VOC (1) Pesticides (1)
MW16-2	Central-North Portion of Site	Y	4.5	1.5-4.5 m	Borehole required to obtain data on the environmental condition of soil and groundwater at former location of Diesel Fuel USTs and pump island and to assess native clay conditions	Granular Fill Native Clay	Metals and Inorganics (2) PAH (2) PHC F1-F4/VOC (2)	Clay	Metals and Inorganics (1) PAH (1) PHC F1-F4/VOC (1)
MW16-3	Southwest Portion of Site	Y	4.5	1.5-4.5 m	Borehole required to obtain data on the environmental condition of soil and groundwater at former location of waste oil UST and to assess native clay conditions	Granular Fill Native Clay	Metals and Inorganics (2) PAH (2) PHC F1-F4/VOC (2)	Clay	Metals and Inorganics (1) PAH (1) PHC F1-F4/VOC (1)
MW16-4	Southwest Portion of Site	Y	4.5	1.5-4.5 m	Borehole required to obtain data on the environmental condition of soil and groundwater at location of shop drain holding tank and to assess environmental conditions of fill and upper native clay soils in this area of the site.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (2) PHC F1-F4/VOC (2)	Clay	Metals and Inorganics (1) PAH (1) PHC F1-F4/VOC (1)
MW16-5	Interior of Garage Building	Y	4.5	1.5-4.5 m	Borehole required to obtain data on the environmental condition of soil and groundwater at location of the bus garage maintenance pit.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (2) PHC F1-F4/VOC (2)	Clay	Metals and Inorganics (1) PAH (1) PHC F1-F4/VOC (1)
BH16-6	West Side of Site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1)	-	-
BH16-7	Northwest Corner	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1) Pesticides (1)	-	-
BH16-8	South side of site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) Pesticides (1) PHC F1-F4/VOC (1)	-	-
BH16-9	North of Garage Building	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1)	-	-
BH16-10	South side of site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1)	-	-
BH16-11	Centre of Site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2)	-	-

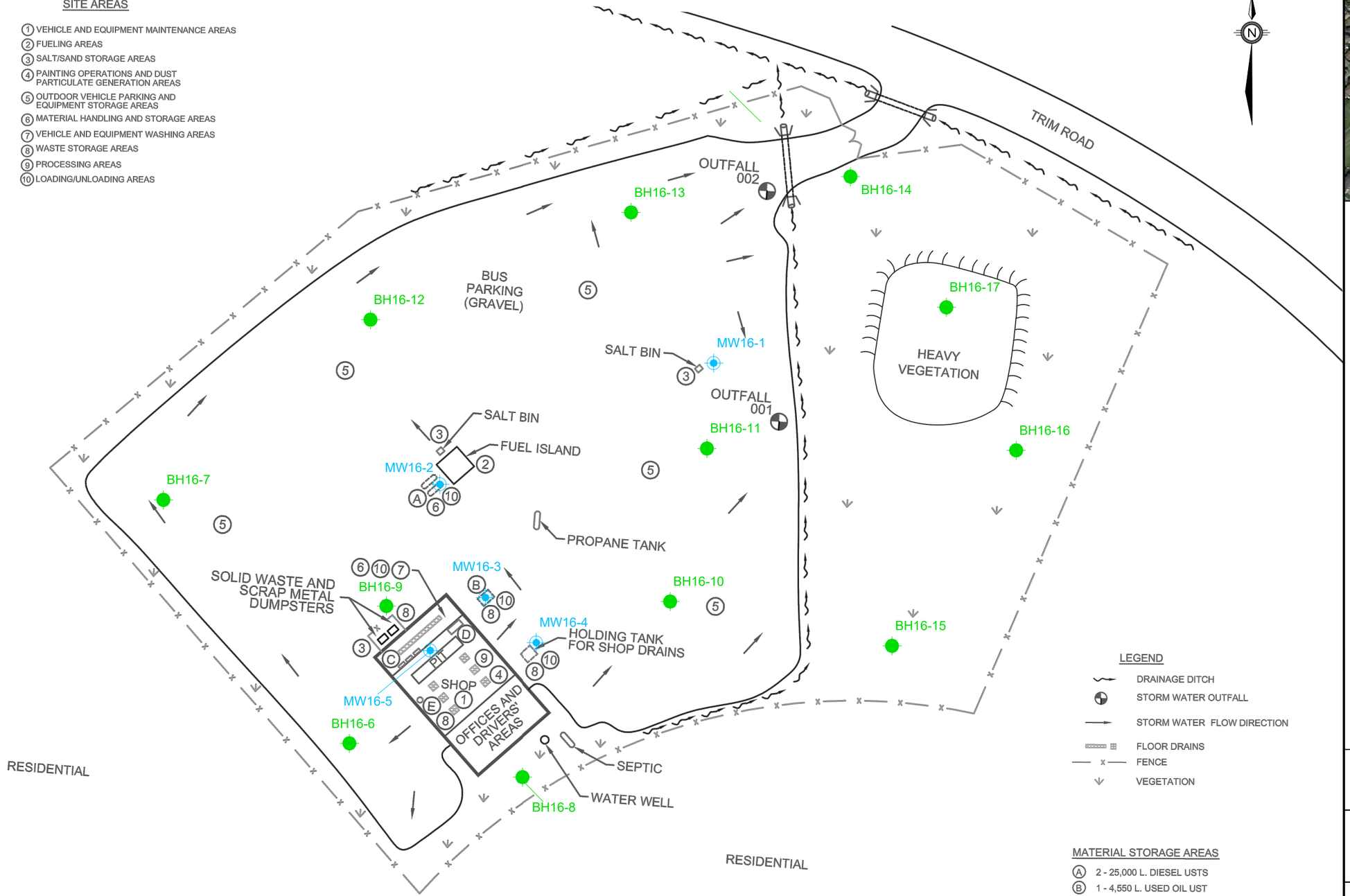
TABLE 1

BOREHOLE RATIONALE FOR ENVIRONMENTAL ASSESSMENT

Borehole ID	Location	Monitoring Well Installed Y/N	Estimated BH Depth (mbgs)	Screen Interval (mbgs)	Rationale	Laboratory Testing Program			
						Stratum	Soil Samples	Aquifer	Groundwater Samples
BH16-12	North Side of Site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1) Pesticides (1)	-	-
BH16-13	North Side of Site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1) Pesticides (1)	-	-
BH16-14	Northwest Corner of Vegetated Area of Site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1)	-	-
BH16-15	South side of Vegetated area of site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1) Pesticides (1)	-	-
BH16-16	Northeast corner of Vegetated area of site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2)	-	-
BH16-17	Possible Stockpile in Vegetated Area of Site	N	3	-	Borehole required to obtain general data on the environmental condition of fill and native soils underlying this portion of the site to determine whether meet the Table 5 Stratified SCS.	Granular Fill Native Clay	Metals and Inorganics (2) PAH (1) PHC F1-F4/VOC (1) Pesticides (1)	-	-

SITE AREAS

1. VEHICLE AND EQUIPMENT MAINTENANCE AREAS
2. FUELING AREAS
3. SALT/SAND STORAGE AREAS
4. PAINTING OPERATIONS AND DUST PARTICULATE GENERATION AREAS
5. OUTDOOR VEHICLE PARKING AND EQUIPMENT STORAGE AREAS
6. MATERIAL HANDLING AND STORAGE AREAS
7. VEHICLE AND EQUIPMENT WASHING AREAS
8. WASTE STORAGE AREAS
9. PROCESSING AREAS
10. LOADING/UNLOADING AREAS



LEGEND:

- BH16-20 — PROPOSED BOREHOLE LOCATION
- MW16-1 — PROPOSED MONITORING WELL LOCATION
- POTENTIAL SOIL STOCKPILE

LEGEND

- DRAINAGE DITCH
- STORM WATER OUTFALL
- STORM WATER FLOW DIRECTION
- FLOOR DRAINS
- FENCE
- VEGETATION

MATERIAL STORAGE AREAS

- (A) 2 - 25,000 L. DIESEL USTS
- (B) 1 - 4,550 L. USED OIL UST
- (C) 2 - 1,130 L. MOTOR OIL ASTS
  1 - 1,130 L. ATF AST
  1 - WINDSHIELD WASHER FLUID AST
- (D) 4 - 55 GAL ANTIFREEZE DRUMS
  4 - 120 LB. GREASE AND GEAR OIL DRUMS
- (E) 1 - 55 GAL USED ANTIFREEZE DRUM

0 20 40 metres

SCALE 1:1000

ARCADIS

FIRST GROUP AMERICA INC.

PHASE I/II ESA PROGRAM

1830 Trim Road, Orleans, ON

PROPOSED BOREHOLE LOCATION PLAN

Drawn By: J.B.S.	Approved By: C.A.A.	Project No: 562775	
Date: DEC 2015	Scale: AS SHOWN	Drawing No: 562775-1	

Z:\560000 Series\562775-1830 TRIM\562775 PH I_II ESA.dwg LAYOUT: LAYOUT1 SAVED: 12/17/2015 10:19 AM PLOTTED: 12/17/2015 10:25 AM BY: PAUL LANDRY

APPENDIX B

Borehole, Monitoring Well and Test Pit Logs

Date: 12-May-16	**Test Pit: TP16-1**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 464012, N 5035821, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.1	**Topsoil** brownish grey, dry	-	-	-	-	
0.1 - 0.6	**Sand and Gravel Fill** brown, dry	-	-	-	-	
0.6 - 2.0	**Silty Clay** greenish grey,oxidized, soft to stiff and blocky at 2.0 m bgs, dry	Grab	TP16-1-1	0.7	chromium and electrical conductivity	
		Grab	TP16-1-2	1.7	chromium and electrical conductivity	
End Depth 2.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-2**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 464039, N 5035819, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 1.0	**Sand and Gravel Fill** brownish grey, dry	Grab	TP16-2-1 (Dup-3)	1	chromium and electrical conductivity	
1.0 - 2.0	**Silty Clay** brownish grey, dry	Grab	TP16-2-2	1.7	chromium and electrical conductivity	
End Depth 2.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-3**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 463976, N 5035786, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.7	**Sand and Gravel Fill** brownish grey, dry					
0.7 - 2.0	**Silty Clay** greenish grey, some oxidation, soft to stiff and blocky, dry	Grab	TP16-3-1 (Dup-1)	0.7	chromium and electrical conductivity	
		Grab	TP16-3-2	1.9	chromium and electrical conductivity	
End Depth 2.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-4**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 464023, N 5035776, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 1.0	**Sand and Gravel Fill** brownish grey, water seeping in at 1.0 m bgs	Grab	TP16-4-1 (Dup-2)	0.4	FOC (for Dup-2 only), chromium and electrical conductivity	
1.0 - 2.0	**Silty Clay** greenish grey, soft, wet	Grab	TP16-4-2	1.9	chromium and electrical conductivity	
End Depth 2.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-5**	SAMPLES			
Logged by: S. Hannington Method: Backhoe Location: E 464014, N 5035748, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 0.9	**Sand and Gravel Fill** brownish grey, dry, some water seeping 0.9 m bgs	Grab	TP16-5-1	0.7	barium and electrical conductivity
0.9 - 2.0	**Silty Clay** greenish grey, some oxidation, soft, dry	Grab	G.S.-1	1	grain size
		Grab	TP16-5-2	1.9	barium and electrical conductivity
End Depth 2.0 m bgs					

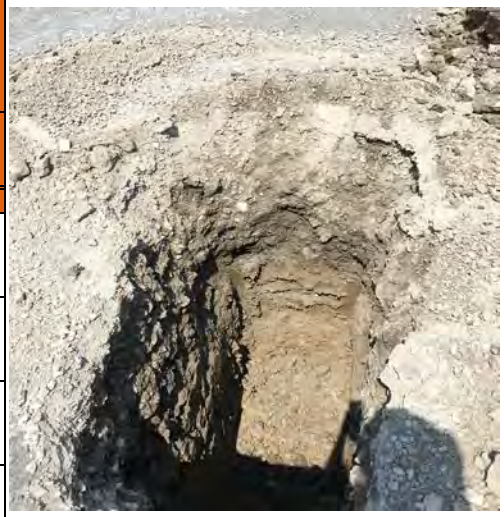
Date: 12-May-16	**Test Pit: TP16-6**	SAMPLES			
Logged by: S. Hannington Method: Backhoe Location: E 464059, N 5035754, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 1.0	**Sand and Gravel Fill** brownish grey, water seeping in at 1.0 m bgs	Grab	TP16-6-1	0.5	barium and electrical conductivity
1.0 - 2.0	**Silty Clay** greenish grey, wet	Grab	TP16-6-2 G.S.-2	1.3	FOC (for TP16-6-2 only), barium and electrical conductivity, grain size
		Grab	TP16-6-3	2	barium and electrical conductivity
End Depth 2.0 m bgs					

Date: 12-May-16	**Test Pit: TP16-7**	SAMPLES			
Logged by: S. Hannington Method: Backhoe Location: E 464009, N 5035729, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 0.9	**Sand and Gravel Fill** brownish grey, some silty clay, dry	Grab	TP16-7-1	0.7	barium and electrical conductivity
0.9 - 2.0	**Silty Clay** brown to greenish grey, soft, dry	Grab	TP16-7-2	2	barium and electrical conductivity
End Depth 2.0 m bgs					

Date: 12-May-16	**Test Pit: TP16-8**	SAMPLES			
Logged by: S. Hannington Method: Backhoe Location: E 463928, N 5035753, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 0.6	**Sand and Gravel Fill** brownish grey, dry	-	-	-	-
0.6 - 1.0	**Silty Clay** brown to greenish grey, soft, dry	Grab	TP16-8-1	0.7	electrical conductivity
End Depth 1.0 m bgs					

Date: 12-May-16	**Test Pit: TP16-9**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 463941, N 5035727, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.6	**Sand and Gravel Fill** brownish grey, dry to damp	-	-	-	-	
0.6 - 1.0	**Silty Clay** dark greenish grey, some black staining, some oxidation, damp	Grab	TP16-9-1	0.6	electrical conductivity	
End Depth 1.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-10**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 463921, N 5035693, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.6	**Sand and Gravel Fill** brownish grey, dry	-	-	-	-	
0.6 - 1.0	**Silty Clay** dark greenish grey, some brown bands, some oxidation, soft, damp	Grab	TP16-10-1	0.7	electrical conductivity	
End Depth 1.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-11**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 463939, N 5035674, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.7	**Sand and Gravel Fill** brownish grey, dry	-	-	-	-	
0.7 - 2.0	**Silty Clay** dark greenish grey and brown, dry	Grab	TP16-11-1	0.8	barium and electrical conductivity	
		Grab	G.S.-3	0.9	grain size	
		Grab	TP16-11-2	1.8	barium and electrical conductivity	
End Depth 2.0 m bgs						

Date: 12-May-16	**Test Pit: TP16-12**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 463973, N 5035635 Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.7	**Sand and Gravel Fill** brownish grey, dry	-	-	-	-	
0.7 - 2.0	**Silty Clay** dark greenish grey, minor oxidation, dry	Grab	TP16-12-1	0.8	barium and electrical conductivity	
		Grab	TP16-12-2	0.9	FOC	
		Grab	TP16-12-3	1.8	barium and electrical conductivity	
End Depth 2.0 m bgs						

Date:	12-May-16	**Test Pit: TP16-13**	SAMPLES				
Logged by:	S. Hannington		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Method:	Backhoe						
Location:	E 464032, N 5035672, Zone 18 N						
Depth (m)	Description						
0 - 0.8	**Sand and Gravel Fill** brownish grey, dry		-	-	-	-	
0.8 - 1.0	**Silty Clay** greenish grey to brown, dry		Grab	TP16-13-1	0.9	electrical conductivity	
End Depth 1.0 m bgs							

Date:	12-May-16	**Test Pit: TP16-14**	SAMPLES				
Logged by:	S. Hannington		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Method:	Backhoe						
Location:	E 464101, N 5035795, Zone 18 N						
Depth (m)	Description						
0 - 0.5	**Topsoil** grassy surface, brown, dry		-	-	-	-	
0.5 - 1.2	**Silty Clay** greenish grey, dry		Grab	TP16-14-1	0.8	cyanide	
End Depth 1.2 m bgs							

Date: 12-May-16	**Test Pit: TP16-15**	SAMPLES				
Logged by: S. Hannington Method: Backhoe Location: E 464131, N 5035812, Zone 18 N		Type	Sample I.D.	Depth (m bgs)	Sample Analysis	
Depth (m)	Description					
0 - 0.5	**Topsoil** grassy surface, brown, dry	-	-	-	-	
0.5 - 1.2	**Silty Clay** greenish grey, dry	Grab	TP16-15-1	0.8	cyanide	
End Depth 1.2 m bgs						

Test Pit Logs
FirstGroup America
1830 Trim Road
Ottawa, Ont.
(March 2018)

ARCADIS Design & Consultancy for natural and built assets

Date: 13-Mar-18	**Test Pit: BH18-5**	SAMPLES			
Logged by: A. Williamson Method: Hand Shovel Location:		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 0.5	**Topsoil** dark brown, black, rootlets, wet	Grab	BH18-5	0.5	PCBs, PHC F1-F4
End Depth 0.5 m bgs					

Date: 13-Mar-18	**Test Pit: BH18-6**	SAMPLES			
Logged by: A. Williamson Method: Hand Shovel Location:		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 0.5	**Topsoil** dark brown, black, rootlets, wet	Grab	BH18-6 / DUP-3	0.5	PCBs, PHC F1-F4
End Depth 0.5 m bgs					

Date: 13-Mar-18	**Test Pit: BH18-7**	SAMPLES			
Logged by: A. Williamson Method: Hand Shovel Location:		Type	Sample I.D.	Depth (m bgs)	Sample Analysis
Depth (m)	Description				
0 - 0.65	**Topsoil** dark brown, black, rootlets, wet	Grab	BH18-6	0.65	PCBs, PHC F1-F4
End Depth 0.65 m bgs					

LOG NO: BH16-1

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

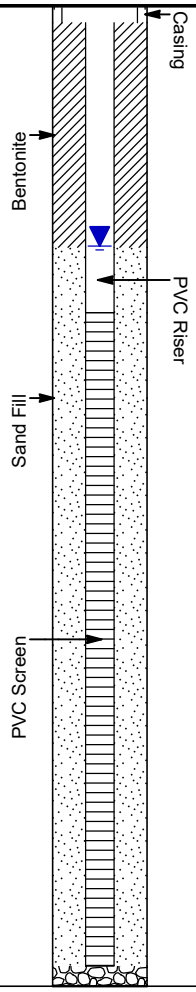
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035764 **EASTING** 463430
DRILL DATE 16-2-9
GROUND ELEVATION 99.56 masl **TOC ELEVATION** 99.49 masl
LOGGED BY Alisha Williamson **CHECKED BY** TA
GROUND WATER LEVEL 1.04 mbgs (2016-02-18)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.52 masl (2016-02-18)

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (masl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.0	**GRAVEL**, FILL, no staining, no odour			G	100		55 ppm	
1.0		98.55 / 1.01						
1.0	**CLAYEY SILT**, NATIVE, with gravel, loose, very moist by 1.2 m depth, no staining, no odour		1		50	4-5-3-3	60 ppm	M, I, P, B, F1, F2, V
2.2		97.23 / 2.33			0	5-5-5-7	0 ppm	
2.4	**CLAY**, light greyish blue, firm to very soft, wet, no staining, no odour				95	2-4-3-4	0 ppm	
3.4			2		100	2-2-2-2	0 ppm	M, I, P, B, F1, F2, V
4.2					100	1		
4.4		94.99 / 4.57						

End of Borehole at 4.57meters

WELL DIAGRAM

Casing Type: Flush Mount
Ground Level to TOC: -0.08 (m)



NOTES:

masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

G Grab Sample
Split Spoon

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.

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LOG NO: BH16-2

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

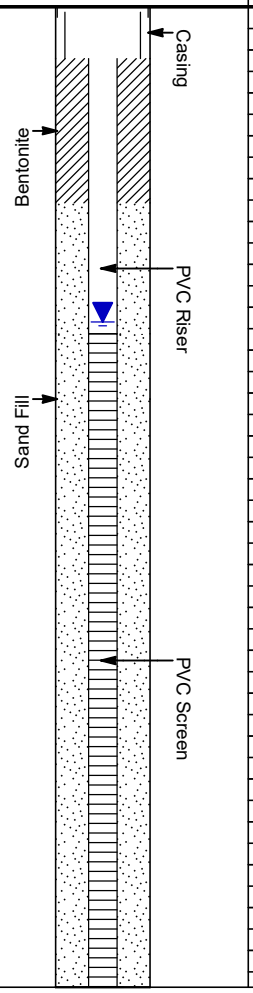
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035748 **EASTING** 463980
DRILL DATE 16-2-9
GROUND ELEVATION 99.65 masl **TOC ELEVATION** 99.4 masl
LOGGED BY Alisha Williamson **CHECKED BY** TA
GROUND WATER LEVEL 1.23 mbgs (2016-02-18)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.42 masl (2016-02-18)

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.0	**GRAVEL**, FILL, light to dark brown, no staining, no odour			G	100		0 ppm	
0.6			1					M, I, P, B, F1, F2, V
1.0		98.63 / 1.02						
1.0	**CLAY**, NATIVE, light grey, firm, wet, no staining, no odour				0	3-3-5-7	0 ppm	
2.0					100	1-2-5-5	0 ppm	
2.2	Becoming soft at 2.13m	2.13						
3.0					100	2-2-1-2	0 ppm	
3.0	Becoming very soft at 3.05m	3.05						
3.4			2		100	1-1-1-1	0 ppm	M, I, P, B, F1, F2, V
4.2					100	1	0 ppm	
4.4		95.08 / 4.57						

End of Borehole at 4.57meters

WELL DIAGRAM

Casing Type: Flush Mount
Ground Level to TOC: -0.24 (m)



NOTES:

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ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

G Grab Sample
Split Spoon

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LOG NO: BH16-3

BOREHOLE LOG

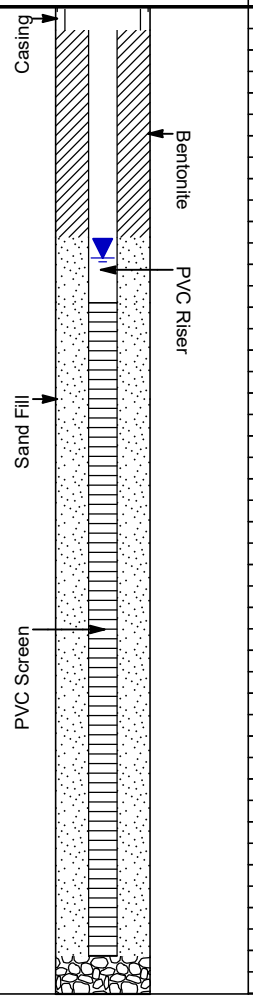
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035700 **EASTING** 463982
DRILL DATE 16-2-9
GROUND ELEVATION 99.77 masl **TOC ELEVATION** 99.66 masl
LOGGED BY Alisha Williamson **CHECKED BY** TA
GROUND WATER LEVEL 1.06 mbgs (2016-02-09)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.71 masl (2016-02-09)

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (masl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.0	**GRAVEL**, FILL, no staining, no odour							
			1	G	100		0 ppm	M, I, P, B, F1, F2, V
1.0		98.72						
1.05	**CLAY**, NATIVE, light brown, soft to firm, moist, no staining, no odour, inferred to commence at 1.05 mbgs				5	3-2-2-2	0 ppm	
					100	1-2-3-3	0 ppm	
2.32	Becoming soft to very soft and saturated at 2.32m				100	2-2-2-2	0 ppm	
			2		100	1-2-2-1	0 ppm	M, I, P, B, F1, F2, V
					100		0 ppm	
4.6		95.17						
4.60	End of Borehole at 4.60meters							

WELL DIAGRAM

Casing Type: Flush Mount
Ground Level to TOC: -0.11 (m)



NOTES:

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mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

G Grab Sample
Split Spoon

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LOG NO: BH16-4

BOREHOLE LOG

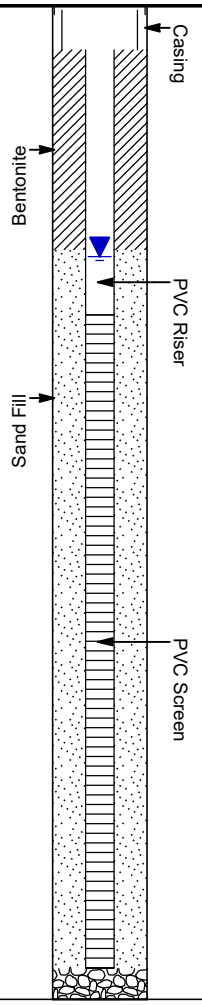
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035687 **EASTING** 463995
DRILL DATE 16-2-9
GROUND ELEVATION 99.76 masl **TOC ELEVATION** 99.56 masl
LOGGED BY Alisha Williamson **CHECKED BY** TA
GROUND WATER LEVEL 0.97 mbgs (2016-02-18)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.79 masl (2016-02-18)

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (masl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.0	**GRAVEL**, FILL, no staining, no odour							
0.2			1	G	100		0 ppm	M, I, P, B, F1, F2, V
0.4								
0.6								
0.8								
1.0								
1.2		98.45			0	5-3-3-3	0 ppm	
1.4	**CLAY**, NATIVE, light orangeish grey, stiff to firm, no odour, no staining	1.31						
1.6								
1.8					90	2-4-5-6	0 ppm	
2.0								
2.2								
2.4								
2.6					100	2-2-3-3	0 ppm	
2.8								
3.0		96.71						
3.2	**CLAY**, light grey, soft to very soft, no staining, no odour	3.05						
3.4			2		100	1-2-1-2	0 ppm	M, I, P, B, F1, F2, V
3.6								
3.8								
4.0								
4.2					100	1-1-1-1	0 ppm	
4.4								
4.6		95.13						
	End of Borehole at 4.63meters	4.63						

WELL DIAGRAM

Casing Type: Flush Mount
Ground Level to TOC: -0.20 (m)



NOTES:

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toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

G Grab Sample
Split Spoon

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LOG NO: BH16-5

BOREHOLE LOG

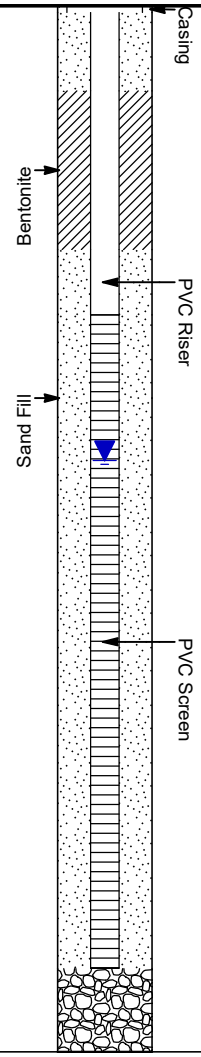
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035673 **EASTING** 463997
DRILL DATE 16-2-16
GROUND ELEVATION 100.01 masl **TOC ELEVATION** 100.02 masl
LOGGED BY Chris Davis **CHECKED BY** TA
GROUND WATER LEVEL 2.13 mbgs (2016-03-01)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 97.88 masl (2016-03-01)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.2		**CONCRETE**, Augered through concrete surface	99.78						
0.4		**GRAVELLY SAND**, FILL, brown, dry, no staining, no odour	0.23			50		0 ppm	
0.6									
0.8									
1.0			99.01						
1.2		**CLAY**, NATIVE, grey, moist to wet, no staining, no odour	1.00	1					M, I, P, B, F1, F2, V
1.4									
1.6									
1.8						100		0 ppm	
2.0									
2.2									
2.4									
2.6									
2.8									
3.0						100		0 ppm	
3.2									
3.4									
3.6									
3.8									
4.0									
4.2						100		0 ppm	
4.4				2					M, I, P, B, F1, F2, V
4.6									
4.8		End of Borehole at 4.88meters	95.13 4.88						

WELL DIAGRAM

Casing Type: Flush Mount
Ground Level to TOC: 0.01 (m)



NOTES:

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mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH16-6

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035655
EASTING 463945
DRILL DATE 16-2-17
HOLE DIAMETER 0.203 "
GROUND ELEVATION 99.79 masl
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**SANDY GRAVEL**, FILL, brown, loose, dry, no staining, no odour								0.2
0.4										0.4
0.6				1		100		0 ppm	M, I, P, B, F1, F2, V	0.6
0.8										0.8
1.0			98.78 1.01							1.0
1.2		**CLAY**, NATIVE, grey, compact, no staining, no odour								1.2
1.4										1.4
1.6										1.6
1.8						100		0 ppm		1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						75		0 ppm		3.0
3.2				2					M, I	3.2
3.4										3.4
3.6			96.13 3.66							3.6

End of Borehole at 3.66meters

NOTES:

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LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: BH16-7

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035714
EASTING 463900
DRILL DATE 16-2-17
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**GRAVEL**, FILL, and sand, brown, loose, dry, no staining, no odour								0.2
0.4				1					M, I, P, B, F1, F2, V, Pes	0.4
0.6		**SILT**, NATIVE, dark brown, compact, dry, no staining, no odour	0.58			100		0 ppm		0.6
0.8										0.8
1.0		**CLAY**, grey, compact, moist, no staining, no odour	0.94							1.0
1.2										1.2
1.4										1.4
1.6										1.6
1.8						100		0 ppm		1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						80		0 ppm		3.0
3.2				2					M, I	3.2
3.4										3.4
3.6										3.6
		End of Borehole at 3.66meters	3.66							

NOTES:

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LEL = Lower Explosive Limit

LAB ANALYSIS:

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I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH16-8

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035658
EASTING 463998
DRILL DATE 16-2-17
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**GRAVEL**, FILL, and sand, brown, no staining, no odour			100		0 ppm		0.2
0.4									0.4
0.6									0.6
0.8									0.8
1.0		**CLAY**, NATIVE, grey, moist, no staining, no odour 0.82							1.0
1.2									1.2
1.4			1		90		0 ppm	M, I, P, B, F1, F2, V, Pes	1.4
1.6									1.6
1.8									1.8
2.0									2.0
2.2									2.2
2.4									2.4
2.6									2.6
2.8			2		80		0 ppm	M, I	2.8
3.0									3.0
3.2									3.2
3.4									3.4
3.6		End of Borehole at 3.66meters 3.66							3.6

NOTES:

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ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH16-9

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035688
EASTING 463959
DRILL DATE 16-2-17
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**GRAVEL**, FILL, and sand, brown, dry, no staining, no odour							0.2
0.4									0.4
0.6			1		100		0 ppm	M, I, P, B, F1, F2, V	0.6
0.8									0.8
1.0		**CLAY**, NATIVE, trace gravel, grey, moist, no staining, no odour 0.94							1.0
1.2									1.2
1.4									1.4
1.6		**CLAY**, grey, moist, no staining, no odour 1.52							1.6
1.8					100		0 ppm		1.8
2.0									2.0
2.2									2.2
2.4									2.4
2.6									2.6
2.8									2.8
3.0					60		0 ppm		3.0
3.2			2					M, I	3.2
3.4									3.4
3.6									3.6
		End of Borehole at 3.66meters 3.69							

NOTES:

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toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

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I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH16-10

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035701
EASTING 464035
DRILL DATE 16-2-16
HOLE DIAMETER 0.203 "
GROUND ELEVATION 99.65 masl
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**GRAVEL**, FILL, some sand, dry, no staining, no odour								0.2
0.4			99.10							0.4
0.6		**CLAY**, NATIVE, with gravel, grey, moist, no staining, no odour	0.55			100		0 ppm		0.6
0.8										0.8
1.0										1.0
1.2			98.43							1.2
		CLAY, trace gravel, grey, moist, no staining, no odour	1.22							
1.4										1.4
1.6										1.6
1.8				1		80		0 ppm	M, I, P, B, F1, F2, V	1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						100		0 ppm		3.0
3.2				2					M, I	3.2
3.4										3.4
3.6			95.99							3.6
		End of Borehole at 3.66meters	3.66							

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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Ottawa, ON, K2H 8K7
Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: BH16-11

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035752
EASTING 464048
DRILL DATE 16-2-16
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**GRAVEL**, FILL, cement-like dust light brown, dry, no staining, no odour, Augered through first 2 feet. Frozen								0.2
0.4										0.4
0.6						80		0 ppm		0.6
0.8		**SAND**, FILL, and gravel, brown, dry, no staining, no odour	0.70							0.8
1.0				1					M, I	1.0
1.2		**CLAY**, NATIVE, trace gravel, grey, compact, moist, no staining, no odour	1.22							1.2
1.4										1.4
1.6										1.6
1.8						100		0 ppm		1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						100		0 ppm		3.0
3.2				2					M, I	3.2
3.4										3.4
3.6		End of Borehole at 3.66meters	3.66							3.6

NOTES:
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mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH16-12

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035790
EASTING 463950
DRILL DATE 16-2-17
HOLE DIAMETER 0.203 "
GROUND ELEVATION 99.4 masl
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**SAND**, FILL, and gravel, brown, dry, no staining, no odour								0.2
0.4										0.4
0.6			98.79			100		0 ppm		0.6
0.8		**CLAY**, NATIVE, with gravel, grey, dry, no staining, no odour	0.61							0.8
1.0			98.47							1.0
1.2		**CLAY**, grey, moist, no staining, no odour	0.93							1.2
1.4										1.4
1.6										1.6
1.8				1		100		0 ppm	M, I, P, B, F1, F2, V, Pes	1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						90		0 ppm		3.0
3.2				2					M, I	3.2
3.4										3.4
3.6			95.74							3.6
		End of Borehole at 3.66meters	3.66							

NOTES:
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toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH16-13

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035805
EASTING 464034
DRILL DATE 16-2-16
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**SAND**, light brown, fine grained, no staining, no odour, cement-like dust								0.2
0.4										0.4
0.6		**GRAVEL**, FILL, and sand, trace clay, brown, no staining, no odour	0.61			80		0 ppm		0.6
0.8										0.8
1.0										1.0
1.2		**CLAY**, NATIVE, grey, moist, no staining, no odour	1.07	1					M, I, P, B, F1, F2, V, Pes	1.2
1.4										1.4
1.6										1.6
1.8						100		0 ppm		1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						100		0 ppm		3.0
3.2										3.2
3.4				2					M, I	3.4
3.6		End of Borehole at 3.66meters	3.66							3.6

NOTES:
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mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH16-14

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push
NORTHING 5035825
EASTING 464070
DRILL DATE 16-2-17
HOLE DIAMETER 0.203 "
GROUND ELEVATION 99.34 masl
LOGGED BY Chris Davis
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**GRAVEL**, FILL, and sand, brown, frozen, no staining, no odour								0.2
0.4										0.4
0.6			98.76							0.6
		GRAVEL, FILL, and sand, trace clay, brown, moist, no staining, no odour	0.58			80		0 ppm		
0.8										0.8
1.0			98.33							1.0
		CLAY, NATIVE, trace gravel, grey, moist, no staining	1.01	1					M, I, P, B, F1, F2, V	
1.2										1.2
1.4										1.4
1.6			97.72							1.6
		CLAY, grey, moist, no staining, no odour	1.62			100		0 ppm		
1.8										1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0						80		0 ppm		3.0
3.2										3.2
3.4				2					M, I	3.4
3.6			95.68							3.6
		End of Borehole at 3.66meters	3.66							

NOTES:
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LAB ANALYSIS:
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I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH16-15

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035694
EASTING 464096
DRILL DATE 16-2-9
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Alisha Williamson
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**TOPSOIL/ORGANICS**, rootlets, with vegetation, no staining, no odour							0.2
0.4									0.4
0.6		**CLAY**, NATIVE, dark to light grey, stiff to firm, moist, no staining, no odour 0.43							0.6
0.8									0.8
1.0									1.0
1.2			1		80	2 3 6 6		M, I, P, B, F1, F2, V, Pes	1.2
1.4									1.4
1.6									1.6
1.8									1.8
2.0					100	2 3 4 4			2.0
2.2									2.2
2.4									2.4
2.6			2			3 2 2 2		M, I	2.6
2.8									2.8
3.0		End of Borehole at 3.11meters 3.11							3.0

NOTES:
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ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH16-16

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035737
EASTING 464128
DRILL DATE 16-2-9
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Alisha Williamson
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**TOPSOIL/ORGANICS**, roots, moist, no staining, no odour							0.2
0.4									0.4
0.6		**CLAY**, NATIVE, light grey, stiff to very soft, moist, no staining, no odour							0.6
0.8									0.8
1.0					90	2 3 6 5	0 ppm		1.0
1.2			1					M, I	1.2
1.4									1.4
1.6									1.6
1.8					100	2 2 2 3	0 ppm		1.8
2.0									2.0
2.2									2.2
2.4									2.4
2.6			2			1 1	0 ppm	M, I	2.6
2.8									2.8
		End of Borehole at 2.93meters 2.93							

NOTES:

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LEL = Lower Explosive Limit

LAB ANALYSIS:

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I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH16-17

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Downing
PROJECTION NAD Zone 18
DRILLING METHOD Auger with Continuous Split Spoon Sampling
NORTHING 5035800
EASTING 464118
DRILL DATE 16-2-9
HOLE DIAMETER 0.203 "
GROUND ELEVATION
LOGGED BY Alisha Williamson
CHECKED BY TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		**TOPSOIL/ORGANICS**, roots, grasses, no staining, no odour, Note: advanced at top of stockpile (2.6 m above surrounding grade)							0.2
0.4		**TOPSOIL**, dark brown, dry, iron oxide staining, no odour 0.37							0.4
0.6									0.6
0.8									0.8
1.0									1.0
1.2			1		90	3 5 8 7	0 ppm	M, I, P, B, F1, F2, V, Pes	1.2
1.4									1.4
1.6		**TOPSOIL**, dark brown, dry, iron oxide staining, manure odour 1.52							1.6
1.8					50	2 3 2 4	0 ppm		1.8
2.0									2.0
2.2									2.2
2.4						4 5 6 6			2.4
2.6							0 ppm		2.6
2.8			2					M, I	2.8
		End of Borehole at 2.99meters 2.99							

NOTES:

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LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-1

BOREHOLE LOG

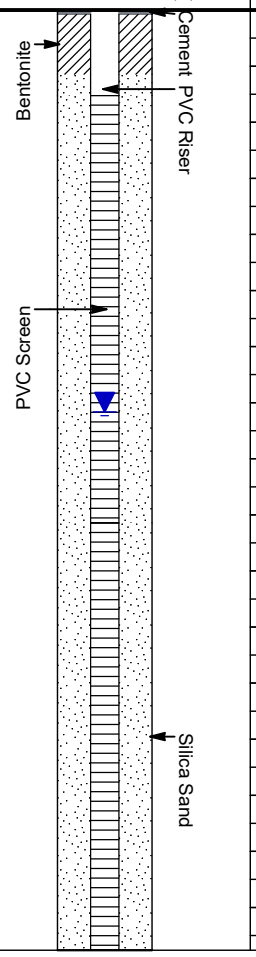
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING _____ **EASTING** _____
DRILL DATE 17-5-9
GROUND ELEVATION 99.972 masl **TOC ELEVATION** 100.914 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 2.38 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.534 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0		**CONCRETE**	99.72						
0.25		**SAND AND GRAVEL**, Fill, brown, dry	99.06	1-1		30		0 ppm	
0.91		**CLAY**, brownish grey, moist to wet, very plastic at depth		1-2		100		20 ppm	B, F1, F2, V
				1-3		100		15 ppm	
3.35		End of Borehole at 3.35meters	96.62						

WELL DIAGRAM

Casing Type: Stick Up
Ground Level to TOC: 0.94 (m)



NOTES:

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mbgs= Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-2

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING _____ **EASTING** _____
DRILL DATE 17-5-9
GROUND ELEVATION 99.966 masl **TOC ELEVATION** 100.562 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 1.99 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.572 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
0.2		**CONCRETE**	99.72							Casing Type: Stick Up Ground Level to TOC: 0.60 (m)	0.2
0.4		**SAND AND GRAVEL**, Fill, brown, dry	0.25							Bentonite, Cement, PVC Riser	0.4
0.6											0.6
0.8				2-1		10		0 ppm			0.8
1.0			99.06								1.0
1.2		**CLAY**, brownish grey, moist to wet, very plastic at depth	0.91								1.2
1.4										PVC Screen	1.4
1.6											1.6
1.8				2-2		100		5 ppm	B, F1, F2, V		1.8
2.0											2.0
2.2											2.2
2.4											2.4
2.6				2-3		100		0 ppm		Silica Sand	2.6
2.8											2.8
3.0											3.0
3.2			96.62								3.2
		End of Borehole at 3.35meters	3.35								

NOTES:
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mbgs= Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH/MW17-3

BOREHOLE LOG

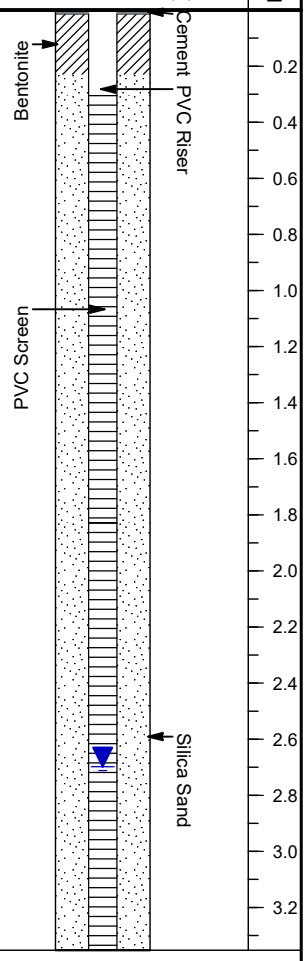
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035664 **EASTING** 464018
DRILL DATE 17-5-9
GROUND ELEVATION 99.699 masl **TOC ELEVATION** 100.661 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 3.66 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 97.001 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (masl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0		**TOPSOIL**, and organics, brown, dry	99.62 / 0.08						
0.2		**SAND**, with topsoil, and organics, dark brown, dry to moist		3-1		50		10 ppm	
0.4									
0.6									
0.8			98.94 / 0.76						
1.0		**CLAY**, trace sand, brownish grey, moist to wet		3-2		100		10 ppm	B, F1, F2, M
1.2									
1.4			98.18 / 1.52						
1.6		**CLAY**, brownish grey, wet, very plastic							
1.8									
2.0									
2.2				3-3		100		5 ppm	
2.4									
2.6									
2.8									
3.0									
3.2									
		End of Borehole at 3.35meters	3.35						

WELL DIAGRAM

Casing Type: Stick Up
Ground Level to TOC: 0.96 (m)



NOTES:

masl = Meters Above Sea Level
mbgs= Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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329 Churchill Ave N.
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Fax: 613-721-0029

LOG NO: BH/MW17-4

BOREHOLE LOG

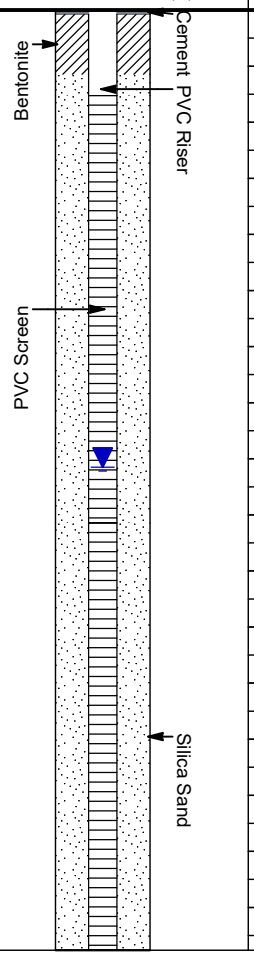
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035752 **EASTING** 463979
DRILL DATE 17-5-9
GROUND ELEVATION 99.505 masl **TOC ELEVATION** 100.418 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 2.54 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 97.878 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.0		**SAND AND GRAVEL**, Fill, trace clay, brown, damp		4-1		30		5 ppm	
0.91		**CLAY**, brownish grey, wet, very plastic at depth	98.60 / 0.91	4-2		100		10 ppm	B, F1, F2
				4-3		100		0 ppm	
3.35		End of Borehole at 3.35meters	96.16 / 3.35						

WELL DIAGRAM

Casing Type: Stick Up
Ground Level to TOC: 0.91 (m)



NOTES:

masl = Meters Above Sea Level
mbgs= Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-5

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035683 **EASTING** 464102
DRILL DATE 17-5-9
GROUND ELEVATION 98.979 masl **TOC ELEVATION** 99.77 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 2.72 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 97.05 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
0		**TOPSOIL**, and organics, brown, dry	98.83							Casing Type: Stick Up Ground Level to TOC: 0.79 (m)	0
0.2		**CLAY**, brownish grey, wet, very plastic at depth	0.15	5-1		100		0 ppm	B, F1, I	Bentonite; Cement PVC Riser	0.2
0.4											0.4
0.6											0.6
0.8											0.8
1.0				5-2		100		0 ppm		PVC Screen	1.0
1.2											1.2
1.4											1.4
1.6											1.6
1.8											1.8
2.0											2.0
2.2				5-3		100		0 ppm			2.2
2.4											2.4
2.6										Silica Sand	2.6
2.8											2.8
3.0											3.0
3.2											3.2
			95.63								
		End of Borehole at 3.35meters	3.35								

NOTES:

masl = Meters Above Sea Level
mbgs= Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-6

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035788 **EASTING** 464151
DRILL DATE 17-5-9
GROUND ELEVATION 98.976 masl **TOC ELEVATION** 99.98 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 2.70 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 97.28 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	WELL DIAGRAM (Casing Type: Stick Up; Ground Level to TOC: 1.00 (m))	DEPTH (m)
0		**TOPSOIL**, and organics, brown, dry	98.83							Bentonite; Cement PVC Riser	0
0.2		**CLAY**, brownish grey, wet, very plastic at depth	0.15	6-1		100		5 ppm	B, F1, I		0.2
0.4											0.4
0.6											0.6
0.8											0.8
1.0				6-2		100		5 ppm		PVC Screen	1.0
1.2											1.2
1.4											1.4
1.6											1.6
1.8											1.8
2.0											2.0
2.2				6-3		100		10 ppm			2.2
2.4											2.4
2.6										Silica Sand	2.6
2.8											2.8
3.0											3.0
3.2											3.2
			95.63								
		End of Borehole at 3.35meters	3.35								

NOTES:

masl = Meters Above Sea Level
mbgs= Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-7

BOREHOLE LOG

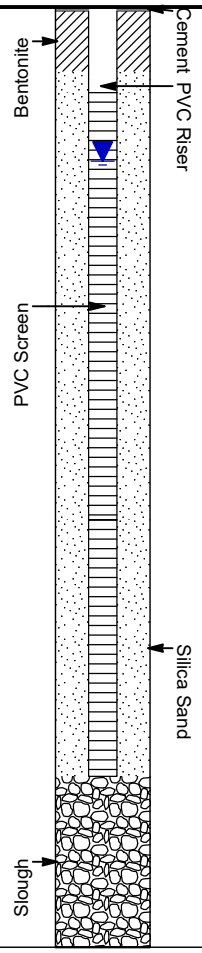
PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035800 **EASTING** 464057
DRILL DATE 17-5-9
GROUND ELEVATION 99.373 masl **TOC ELEVATION** 100.332 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 1.51 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.822 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS
0.0		**SAND AND GRAVEL** Fill, trace clay, brown, damp to wet, minor oxidation		7-1		30		0 ppm	B, F1, F2
			98.61 / 0.76						
		CLAY, trace sand and gravel, brownish grey, wet, minor oxidation		7-2		100		0 ppm	
			97.85 / 1.52						
		CLAY, brownish grey, wet, very plastic		7-3		100		0 ppm	
3.35		End of Borehole at 3.35meters	3.35						

WELL DIAGRAM

Casing Type: Stick Up
Ground Level to TOC: 0.96 (m)



NOTES:

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toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-8

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035703 **EASTING** 463980
DRILL DATE 17-5-9
GROUND ELEVATION 99.737 masl **TOC ELEVATION** 100.569 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 1.89 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.679 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	WELL DIAGRAM (Casing Type: Stick Up; Ground Level to TOC: 0.83 (m))
0.2 – 0.8		**SAND AND GRAVEL**, Fill, grey, dry		8-1		30		5 ppm		Bentonite; Cement; PVC Riser
			98.83 / 0.91							
1.0 – 1.4		**CLAY**, trace sand and gravel, brownish grey, damp to wet		8-2		100		10 ppm	B, F1, F2	PVC Screen
			98.22 / 1.52							
1.6 – 3.2		**CLAY**, brownish grey, wet, very plastic		8-3		100		0 ppm		Silica Sand
		End of Borehole at 3.35meters	3.35							

NOTES:

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LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

☒ Split Spoon

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LOG NO: BH/MW17-9

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario

DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035687 **EASTING** 463986
DRILL DATE 17-5-9
GROUND ELEVATION 99.671 masl **TOC ELEVATION** 100.519 masl
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL 1.71 mbtoc (2017-05-23)
HOLE DIAMETER 0.203 " **WELL DIAMETER** 0.051 "
GROUND WATER ELEVATION 98.809 mbgs (2017-05-23)

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (mbsl) / DEPTH (mbgs)	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	WELL DIAGRAM (Casing Type: Stick Up; Ground Level to TOC: 0.85 (m))	DEPTH (m)
0.0 – 0.91		**SAND AND GRAVEL**, Fill, grey, dry	98.76 / 0.91	9-1		10		0 ppm	B, F1, F2	Bentonite; Cement PVC Riser; PVC Screen	
0.91 – 1.52		**CLAY**, trace sand and gravel, brownish grey, damp to wet	98.15 / 1.52								
1.52 – 3.35		**CLAY**, brownish grey, wet, very plastic		9-2		50		0 ppm		Silica Sand	
3.35		End of Borehole at 3.35meters									

NOTES:
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LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:
☒ Split Spoon

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Fax: 613-721-0029

LOG NO: BH17-10

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT FirstGroup America
PROJECT NAME 1830 Trim Road Phase II ESA
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
DRILLING CONTRACTOR Strata Drilling Group
PROJECTION NAD Zone 18
DRILLING METHOD Direct Push Split Spoon Sampling
NORTHING 5035814 **EASTING** 464032
DRILL DATE 17-5-9
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
LOGGED BY Steve Hannington **CHECKED BY** TA
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.0		**SAND AND GRAVEL**, Fill, brown, dry to damp							0.0
1.07		**CLAY**, brownish grey, moist to wet, very plastic at depth							1.07
3.35		End of Borehole at 3.05meters							3.35

NOTES:

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LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

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LOG NO: BH/MW17-11

BOREHOLE LOG

PROJECT NUMBER 450271-000
CLIENT First Group America Inc
PROJECT NAME Phase II Environmental Site Assessment
PROJECT LOCATION 1830 Trim Road, Ottawa, ON

DRILLING CONTRACTOR Downing
PROJECTION NAD83 18T
DRILLING METHOD Truck Mount
NORTHING _____ **EASTING** _____
DRILL DATE 18/8/17
GROUND ELEVATION _____ **TOC ELEVATION** _____
LOGGED BY L. de Groot **CHECKED BY** Troy Austrins
GROUND WATER LEVEL 4.15 mbgs (19/08/2017)
HOLE DIAMETER 2.5 " **WELL DIAMETER** 1.25 "
GROUND WATER ELEVATION n/a

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	WELL DIAGRAM (Casing Type: Stick Up)	DEPTH (m)
0.2		**GRAVEL**							Clay Backfill	0.2
0.4		**CLAY**, grey, moist, high plasticity 0.30								0.4
0.6										0.6
0.8										0.8
1.0										1.0
1.2										1.2
1.4										1.4
1.6										1.6
1.8									Bentonite	1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0										3.0
3.2										3.2
3.4										3.4
3.6										3.6
3.8										3.8
4.0									Silica Sand	4.0
4.2										4.2
4.4										4.4
4.6										4.6
4.8										4.8
5.0										5.0
5.2										5.2
5.4										5.4
5.6										5.6
5.8										5.8
6.0										6.0
6.2										6.2
6.4										6.4
6.6										6.6
6.8										6.8
7.0										7.0

End of Borehole at 7.12 mbgs 7.12

NOTES:

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LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides

SAMPLE TYPE:

Auger Cuttings

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LOG NO: BH18-1

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING 5035760 **EASTING** 463958
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		No core, soil was not characterized							0.2
0.4									0.4
0.6									0.6
0.8									0.8
1.0									1.0
1.2									1.2
1.4									1.4
1.6									1.6
1.8									1.8
2.0									2.0
2.2									2.2
2.4									2.4
2.6									2.6
2.8									2.8
3.0									3.0
3.2		**CLAY**, light grey, moist to wet	BH18-1					EC	3.2
3.4									3.4
3.6									3.6
3.8									3.8
4.0									4.0
4.2									4.2
4.4									4.4
		3.05							
		End of Borehole at 4.57meters							
		4.57							

NOTES:
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ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
EC = Electrical Conductivity

SAMPLE TYPE:
☒ Split Spoon

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LOG NO: BH18-2

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING 5035636 **EASTING** 464023
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.0		No core, soil was not characterized								0.0
3.0		**CLAY**, light grey, moist to wet	3.05	BH18-2					EC	3.0
4.4		End of Borehole at 4.57meters	4.57							4.4

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
EC = Electrical Conductivity

SAMPLE TYPE:
☒ Split Spoon

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.

Arcadis Canada Inc.
329 Churchill Avenue
Ottawa, ON K1Z 5B8
Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: BH18-3

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING 5035698 **EASTING** 464001
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
GROUND WATER LEVEL ▼ ( )
GROUND WATER ELEVATION ▼ mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		No core, soil was not characterized							0.2
0.4									0.4
0.6									0.6
0.8									0.8
1.0									1.0
1.2									1.2
1.4									1.4
1.6									1.6
1.8									1.8
2.0									2.0
2.2									2.2
2.4									2.4
2.6									2.6
2.8									2.8
3.0									3.0
3.2									3.2
3.4									3.4
3.6									3.6
3.8									3.8
4.0									4.0
4.2		**CLAY**, light grey, moist to wet	BH18-3					EC	4.2
4.4		4.00							4.4
		End of Borehole at 4.57meters 4.57							

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
EC = Electrical Conductivity

SAMPLE TYPE:
☒ Split Spoon

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.

Arcadis Canada Inc.
329 Churchill Avenue
Ottawa, ON K1Z 5B8
Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: BH18-4

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING 5035636 **EASTING** 464023
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.0		No core, soil was not characterized							0.0
3.0									3.0
3.2		**CLAY**, light grey, moist to wet						EC	3.2
3.6			BH18-4	☒					3.6
4.4									4.4
4.57		End of Borehole at 4.57meters							

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
EC = Electrical Conductivity

SAMPLE TYPE:
☒ Split Spoon

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Arcadis Canada Inc.
329 Churchill Avenue
Ottawa, ON K1Z 5B8
Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: SP301

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING 5035790 **EASTING** 464132
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
GROUND WATER LEVEL ▼ ( )
GROUND WATER ELEVATION ▼ mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		No core, soil was not characterized (Borehole location on top of stockpile; 3.8 meters above grade)								0.2
0.4										0.4
0.6										0.6
0.8										0.8
1.0										1.0
1.2										1.2
1.4										1.4
1.6										1.6
1.8										1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0										3.0
3.2										3.2
3.4										3.4
3.6										3.6
3.8		**CLAY**, light grey, moist (Sample taken at grade)	3.80	SP301					Cy	3.8
4.0										4.0
4.2										4.2
4.4										4.4
4.6										4.6
		End of Borehole at 4.80meters	4.80							

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
Cy = Cyanide

SAMPLE TYPE:
☒ Split Spoon

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Arcadis Canada Inc.
329 Churchill Avenue
Ottawa, ON K1Z 5B8
Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: SP302

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING 5035790 **EASTING** 464132
HOLE DIAMETER 0.203 " **GROUND ELEVATION**
GROUND WATER LEVEL ( )
GROUND WATER ELEVATION mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		No core, soil was not characterized (Borehole location on top of stockpile; 4.0 meters above grade)								0.2
0.4										0.4
0.6										0.6
0.8										0.8
1.0										1.0
1.2										1.2
1.4										1.4
1.6										1.6
1.8										1.8
2.0										2.0
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3.0										3.0
3.2										3.2
3.4										3.4
3.6										3.6
3.8										3.8
4.0										4.0
4.2		**CLAY**, light grey, moist to wet (Sample taken at grade)	4.00	SP302					Cy	4.2
4.4										4.4
4.6										4.6
4.8										4.8
		End of Borehole at 5.00meters	5.00							

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
Cy = Cyanide

SAMPLE TYPE:
☒ Split Spoon

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Arcadis Canada Inc.
329 Churchill Avenue
Ottawa, ON K1Z 5B8
Telephone: 613-721-0555
Fax: 613-721-0029

LOG NO: SP303

BOREHOLE LOG

PROJECT NUMBER 450271-000
PROJECT NAME 1830 Trim Road Phase II ESA
DRILLING CONTRACTOR Strata Drilling Group
DRILLING METHOD Geoprobe 7822DT
DRILL DATE 5/13/18
LOGGED BY Lennart de Groot **CHECKED BY** TA

CLIENT FirstGroup America
PROJECT LOCATION 1830 Trim Road Property, Ottawa, Ontario
PROJECTION NAD Zone 18
NORTHING _____ **EASTING** _____
HOLE DIAMETER 0.203 " **GROUND ELEVATION** _____
GROUND WATER LEVEL ▼ ( )
GROUND WATER ELEVATION ▼ mbgs ( )

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	RKI READINGS	LAB ANALYSIS	DEPTH (m)
0.2		No core, soil was not characterized (Borehole location on top of stockpile; 4.0 meters above grade)							0.2
0.4									0.4
0.6									0.6
0.8									0.8
1.0									1.0
1.2									1.2
1.4									1.4
1.6									1.6
1.8									1.8
2.0									2.0
2.2									2.2
2.4									2.4
2.6									2.6
2.8									2.8
3.0									3.0
3.2									3.2
3.4									3.4
3.6									3.6
3.8									3.8
4.0									4.0
4.2		**CLAY**, light grey, moist to wet (Sample taken at grade)	SP303	☒				Cy	4.2
4.4									4.4
4.6									4.6
4.8									4.8
		4.00							
		End of Borehole at 5.00meters							
		5.00							

NOTES:
masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:
M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
F1 = PHC F1
F2 = PHC F2-F4
PCB = PCB's
Pes = Pesticides
Cy = Cyanide

SAMPLE TYPE:
☒ Split Spoon

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329 Churchill Avenue
Ottawa, ON K1Z 5B8
Telephone: 613-721-0555
Fax: 613-721-0029

APPENDIX C

Hydraulic Conductivity Test Report

Arcadis Canada Inc.
329 Churchill Avenue North
Ottawa, ON K1Z 5B8
Telephone: 613 721 0555 / Fax: 613 721 0029

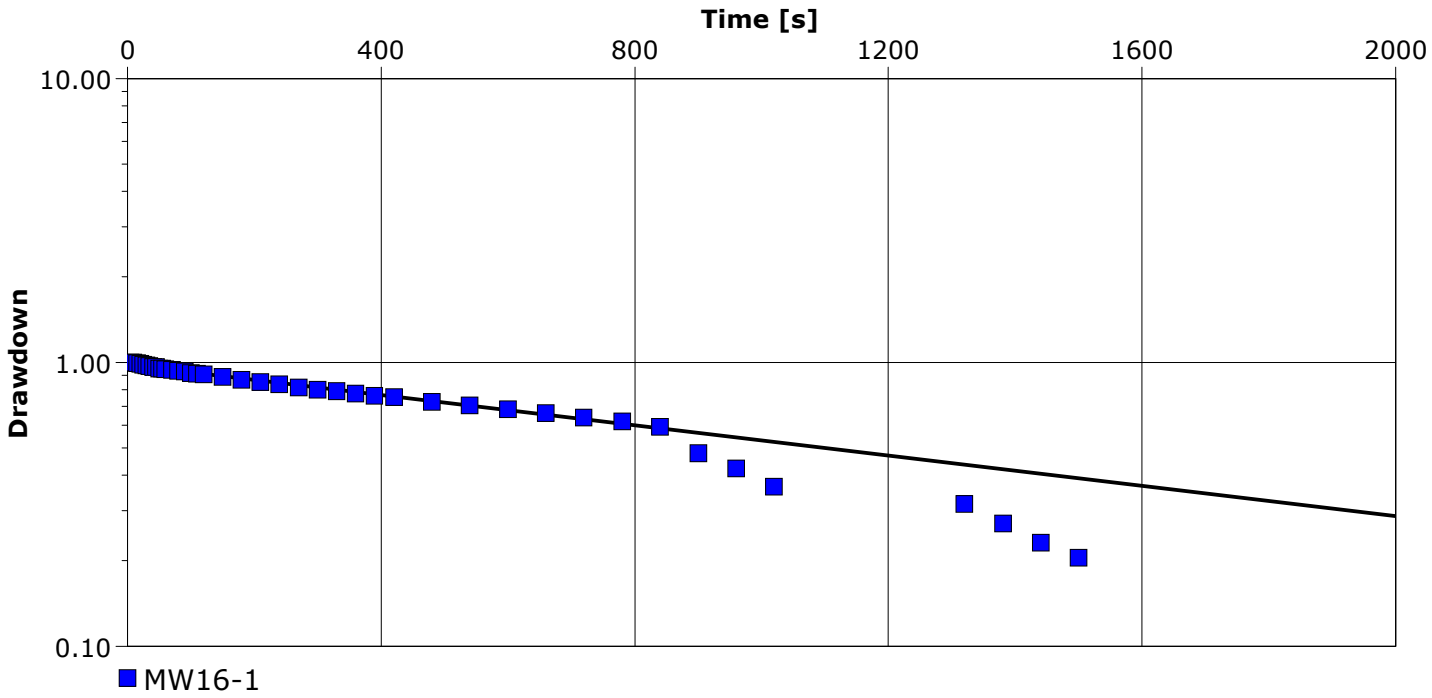
Slug Test Analysis Report

Project: 1830 Trim Road Phase II ESA

Number: 450271-000

Client: FirstGroup America

Location: 1830 Trim Road Property, Ottawa, Ontario	Slug Test: MW16-1	Test Well: MW16-1
Test Conducted by: Alisha Williamson		Test Date: 24/05/2017
Analysis Performed by: Ishtiaque Khandker		Analysis Date: 03/08/2017
Aquifer Thickness: 3.50 m		



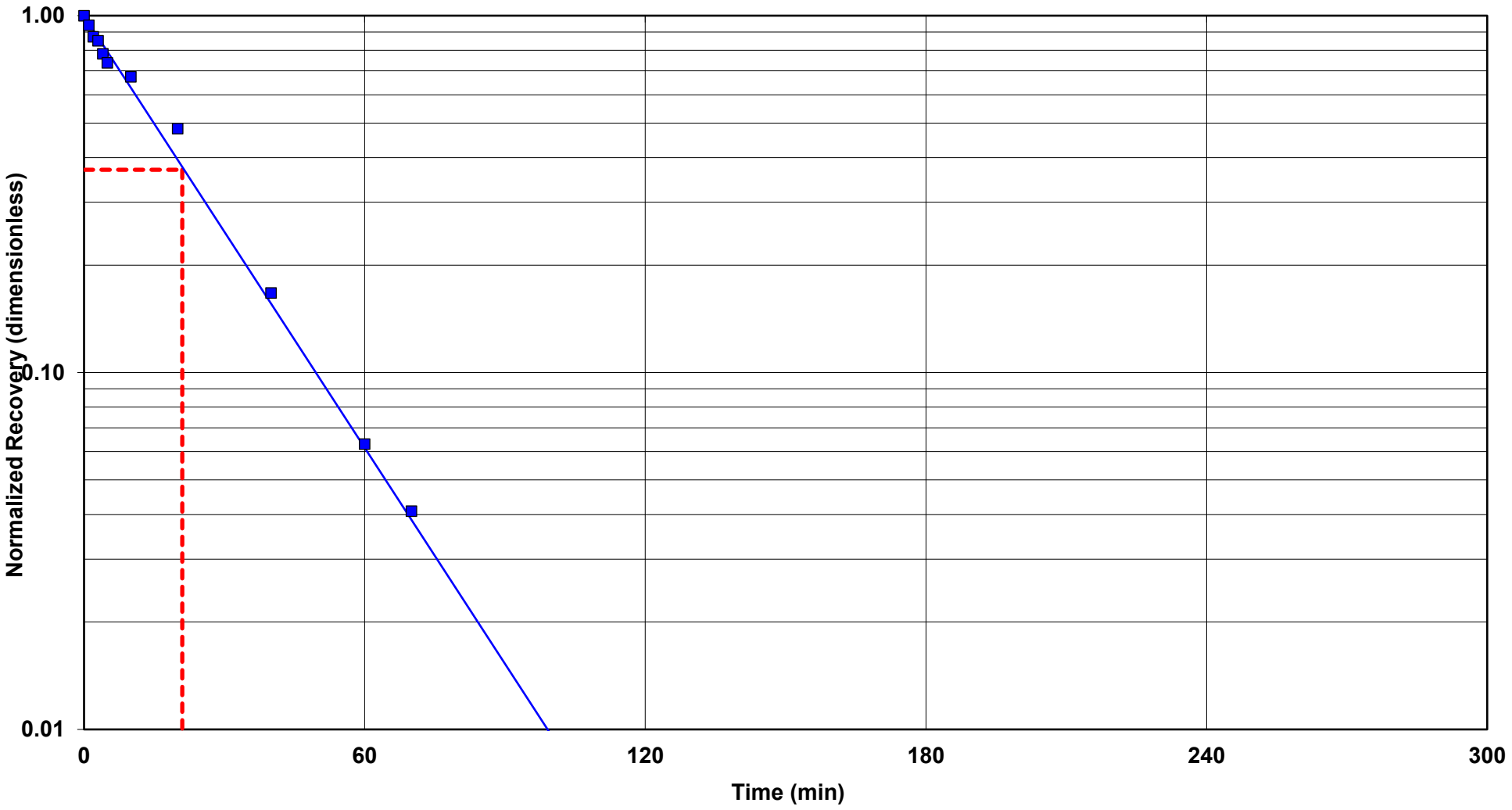
Calculation after Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW16-1	2.42×10^{-7}	

Hydraulic Conductivity Test Report

MW16-2

FIGURE X



Time Lag (T_0) =	21 min	Hvorslev Analysis	
Length of Intake (L) =	3.20 m	$K = \frac{(r^2)\ln(L/R)}{2T_0L}$ =	2.7E-05 cm/s
Radius of Piezometer Casing (r) =	0.0252 m		
Radius of Well Screen (R) =	0.1016 m		

Prepared by: **CSK**

CHK: _____

Arcadis Canada Inc.
329 Churchill Avenue North
Ottawa, ON K1Z 5B8
Telephone: 613 721 0555 / Fax: 613 721 0029

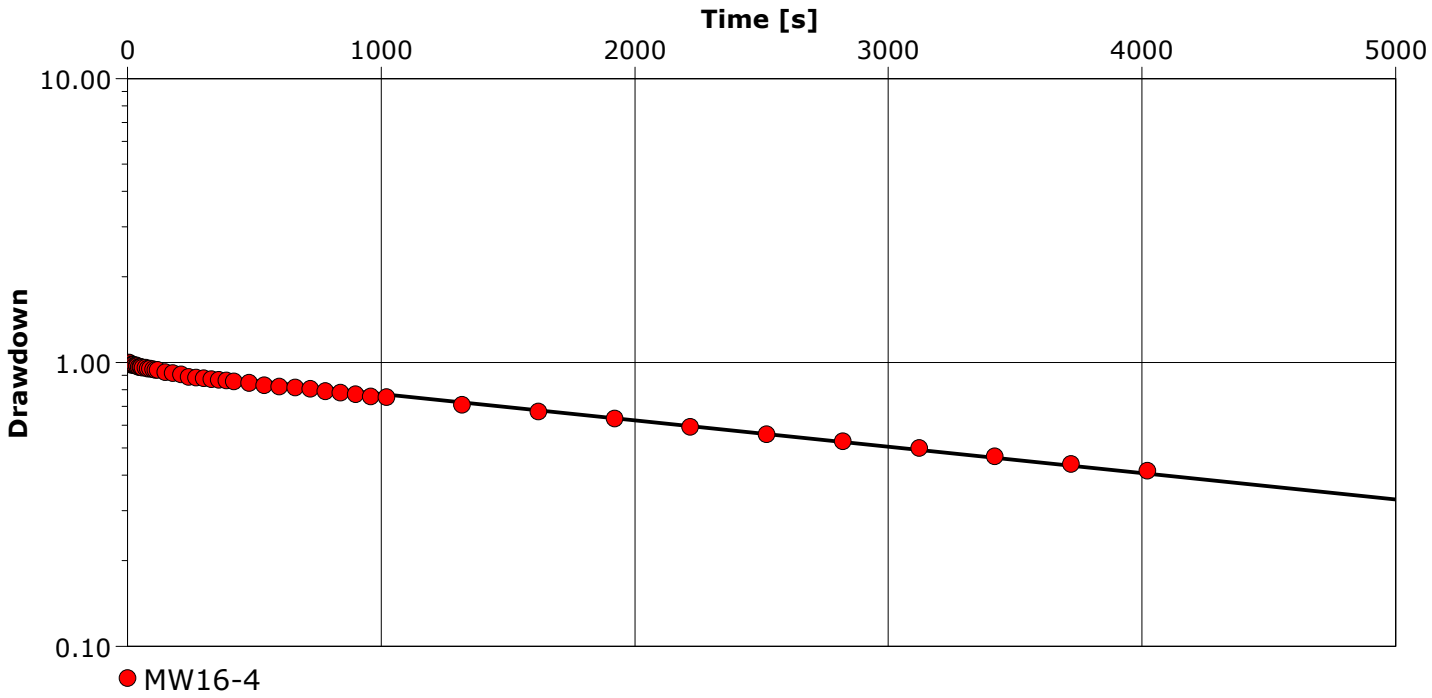
Slug Test Analysis Report

Project: 1830 Trim Road Phase II ESA

Number: 450271-000

Client: FirstGroup America

Location: 1830 Trim Road Property, Ottawa, Ontario	Slug Test: MW16-4	Test Well: MW16-4
Test Conducted by: Alisha Williamson		Test Date: 24/05/2017
Analysis Performed by: Ishtiaque Khandker		Analysis Date: 03/08/2017
Aquifer Thickness: 3.50 m		



Calculation after Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW16-4	8.42×10^{-8}	

Arcadis Canada Inc.
329 Churchill Avenue North
Ottawa, ON K1Z 5B8
Telephone: 613 721 0555 / Fax: 613 721 0029

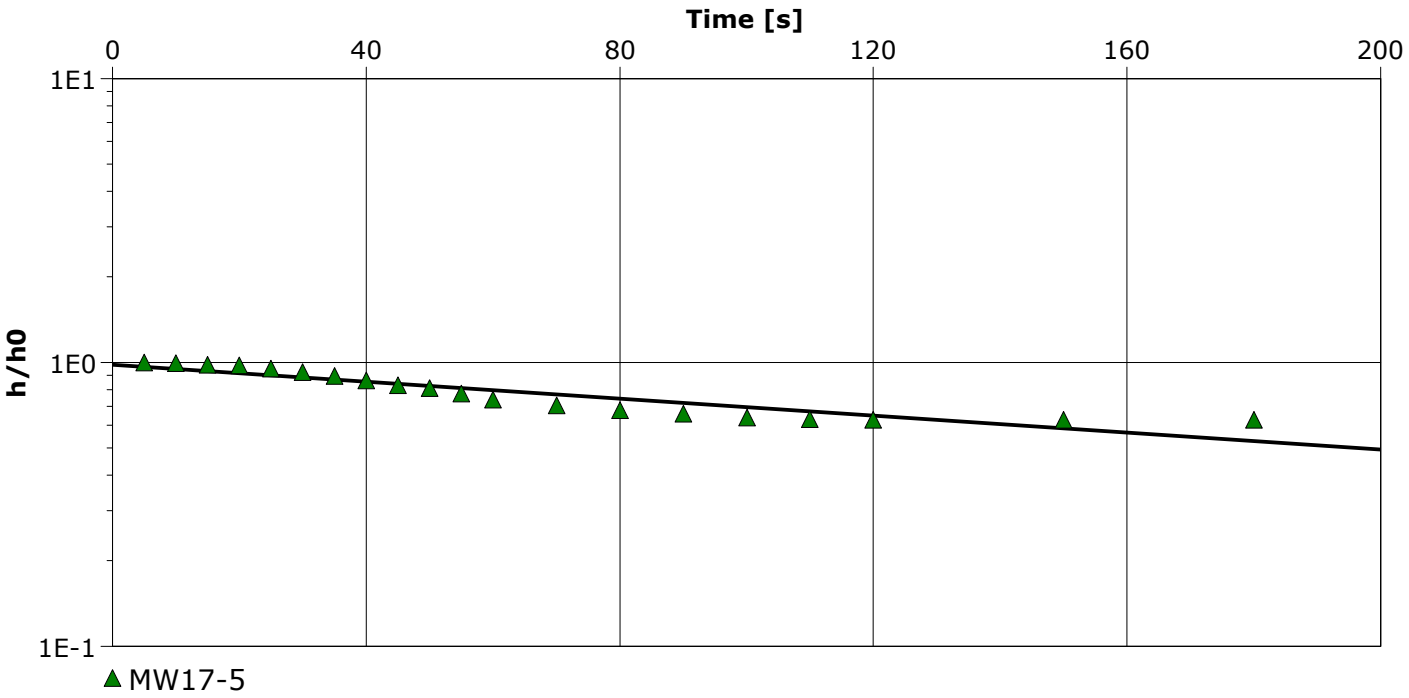
Slug Test Analysis Report

Project: 1830 Trim Road Phase II ESA

Number: 450271-000

Client: FirstGroup America

Location: 1830 Trim Road Property, Ottawa, Ontario	Slug Test: MW17-5	Test Well: MW17-5
Test Conducted by: Alisha Williamson		Test Date: 25/05/2017
Analysis Performed by: Ishtiaque Khandker		Analysis Date: 03/08/2017
Aquifer Thickness: 1.40 m		



Calculation after Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW17-5	1.36×10^{-6}	

APPENDIX D

Laboratory Certificates of Analysis- Soil

Your Project #: 450271-000
Site Location: 1830 TRIM RD.
Your C.O.C. #: 548176-03-01, 548176-02-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/22
Report #: R3903812
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B627697
Received: 2016/02/10, 09:41

Sample Matrix: Soil
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	11	N/A	2016/02/12	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	14	2016/02/16	2016/02/16	CAM SOP-00408	R153 Ana. Prot. 2011
Hot Water Extractable Boron (1)	1	2016/02/18	2016/02/18	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	11	N/A	2016/02/17		EPA 8260C m
Free (WAD) Cyanide (1)	15	2016/02/16	2016/02/17	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	14	N/A	2016/02/17	CAM SOP-00414	OMOE E3138 v2 m
Conductivity (1)	1	N/A	2016/02/18	CAM SOP-00414	OMOE E3138 v2 m
Hexavalent Chromium in Soil by IC (1, 2)	15	2016/02/16	2016/02/17	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 3)	11	N/A	2016/02/16	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 4)	11	2016/02/12	2016/02/12	CAM SOP-00316	CCME CWS m
Acid Extr. Metals (aqua regia) by ICPMS	15	2016/02/10	2016/02/11	OTT SOP-00003	EPA 6020
MOISTURE	11	N/A	2016/02/12	CAM SOP-00445	McKeague 2nd ed 1978
Moisture (1)	4	N/A	2016/02/13	CAM SOP-00445	Carter 2nd ed 51.2 m
OC Pesticides (Selected) & PCB (1, 5)	2	2016/02/18	2016/02/22	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters (1)	2	N/A	2016/02/12	CAM SOP-00307	EPA 8081/8082 m
PAH Compounds in Soil by GC/MS (SIM)	10	2016/02/11	2016/02/12	OTT SOP-00011	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM)	1	2016/02/11	2016/02/17	OTT SOP-00011	EPA 8270D m
pH CaCl2 EXTRACT (1)	15	2016/02/16	2016/02/16	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	14	N/A	2016/02/17	CAM SOP-00102	EPA 6010
Sodium Adsorption Ratio (SAR) (1)	1	N/A	2016/02/18	CAM SOP-00102	EPA 6010
SAR - ICP Metals (1)	14	2016/02/17	2016/02/17	CAM SOP-00408	EPA 6010 m
SAR - ICP Metals (1)	1	2016/02/18	2016/02/18	CAM SOP-00408	EPA 6010 m
Volatile Organic Compounds in Soil (1)	5	N/A	2016/02/11	CAM SOP000228	EPA 8260C m
Volatile Organic Compounds in Soil (1)	6	N/A	2016/02/12	CAM SOP000228	EPA 8260C m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Your Project #: 450271-000
Site Location: 1830 TRIM RD.
Your C.O.C. #: 548176-03-01, 548176-02-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/22
Report #: R3903812
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B627697
Received: 2016/02/10, 09:41

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BVI205	BVI206		BVI207	BVI208	BVI209		
Sampling Date		2016/02/09 16:00	2016/02/09 16:00		2016/02/09 15:40	2016/02/09 15:40	2016/02/09 15:15		
COC Number		548176-03-01	548176-03-01		548176-03-01	548176-03-01	548176-03-01		
	UNITS	**BH16-17-2**	**BH16-17-1**	**RDL**	**BH16-16-2**	**BH16-16-1**	**BH16-15-2**	**RDL**	**QC Batch**
Calculated Parameters									
Sodium Adsorption Ratio	N/A	0.28	0.46		0.95	0.96	1.1		4376618
Inorganics									
Conductivity	mS/cm	0.31	0.14	0.002	0.19	0.13	0.25	0.002	4384070
Free Cyanide	ug/g	0.28	0.10	0.04	0.02	0.02	0.02	0.01	4382594
Moisture	%	28		1.0	39	29	33	1.0	4381620
Available (CaCl2) pH	pH	5.69	6.28		7.42	6.98	7.56		4382808
Metals									
Soluble Calcium (Ca)	mg/L	21.4	12.9	0.5	10.0	5.2	13.1	0.5	4384053
Soluble Magnesium (Mg)	mg/L	11.6	6.1	0.5	8.3	4.9	9.6	0.5	4384053
Soluble Sodium (Na)	mg/L	7	8	5	17	13	22	5	4384053
Inorganics									
Chromium (VI)	ug/g	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.2	4382809
Metals									
Hot Water Ext. Boron (B)	ug/g	0.22	0.21	0.050	0.15	<0.050	0.15	0.050	4382775
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.2	4377133
Acid Extractable Arsenic (As)	ug/g	2	2	1	2	2	2	1	4377133
Acid Extractable Barium (Ba)	ug/g	150	150	0.5	300	320	270	0.5	4377133
Acid Extractable Beryllium (Be)	ug/g	0.8	0.8	0.2	0.9	1.0	1.0	0.2	4377133
Acid Extractable Boron (B)	ug/g	<5	5	5	7	<5	9	5	4377133
Acid Extractable Cadmium (Cd)	ug/g	0.2	0.2	0.1	0.1	0.1	<0.1	0.1	4377133
Acid Extractable Chromium (Cr)	ug/g	82	79	1	140	130	150	1	4377133
Acid Extractable Cobalt (Co)	ug/g	18	18	0.1	24	25	26	0.1	4377133
Acid Extractable Copper (Cu)	ug/g	21	20	0.5	52	45	49	0.5	4377133
Acid Extractable Lead (Pb)	ug/g	17	16	1	10	8	10	1	4377133
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.05	4377133
Acid Extractable Molybdenum (Mo)	ug/g	1.1	0.8	0.5	0.5	0.6	<0.5	0.5	4377133
Acid Extractable Nickel (Ni)	ug/g	34	35	0.5	75	74	82	0.5	4377133
Acid Extractable Selenium (Se)	ug/g	0.8	0.6	0.5	<0.5	<0.5	<0.5	0.5	4377133
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.2	4377133
Acid Extractable Thallium (Tl)	ug/g	0.27	0.27	0.05	0.46	0.44	0.45	0.05	4377133
Acid Extractable Uranium (U)	ug/g	1.4	1.1	0.05	1.2	1.3	0.98	0.05	4377133
Acid Extractable Vanadium (V)	ug/g	75	82	5	110	110	100	5	4377133
Acid Extractable Zinc (Zn)	ug/g	99	83	5	130	120	120	5	4377133

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BVI210	BVI211	BVI212	BVI213	BVI214		
Sampling Date		2016/02/09 15:15	2016/02/09 14:30	2016/02/09 14:30	2016/02/09 13:30	2016/02/09 13:30		
COC Number		548176-03-01	548176-03-01	548176-03-01	548176-03-01	548176-03-01		
	UNITS	**BH16-15-1**	**BH16-4-2**	**BH16-4-1**	**BH16-3-2**	**BH16-3-1**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A	1.2	3.5	4.5	3.6	0.49		4376618
Inorganics								
Conductivity	mS/cm	0.26	1.8	1.1	2.5	0.29	0.002	4384070
Free Cyanide	ug/g	0.02	0.02	0.01	0.02	<0.01	0.01	4382594
Available (CaCl2) pH	pH	7.38	7.55	7.83	7.55	7.84		4382808
Metals								
Soluble Calcium (Ca)	mg/L	11.9	97.7	66.6	184	27.9	0.5	4384053
Soluble Magnesium (Mg)	mg/L	8.7	58.0	9.7	75.5	7.6	0.5	4384053
Soluble Sodium (Na)	mg/L	22	176	149	230	11	5	4384053
Inorganics								
Chromium (VI)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	4382809
Metals								
Hot Water Ext. Boron (B)	ug/g	0.098	0.19	0.49	0.20	0.35	0.050	4382775
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	4377133
Acid Extractable Arsenic (As)	ug/g	3	2	3	2	3	1	4377133
Acid Extractable Barium (Ba)	ug/g	250	250	110	250	120	0.5	4377133
Acid Extractable Beryllium (Be)	ug/g	1.0	0.9	0.3	0.7	0.4	0.2	4377133
Acid Extractable Boron (B)	ug/g	9	8	8	7	9	5	4377133
Acid Extractable Cadmium (Cd)	ug/g	0.1	0.1	<0.1	0.1	<0.1	0.1	4377133
Acid Extractable Chromium (Cr)	ug/g	140	140	10	140	20	1	4377133
Acid Extractable Cobalt (Co)	ug/g	26	23	3.3	23	5.7	0.1	4377133
Acid Extractable Copper (Cu)	ug/g	54	54	4.6	51	15	0.5	4377133
Acid Extractable Lead (Pb)	ug/g	11	9	5	9	11	1	4377133
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4377133
Acid Extractable Molybdenum (Mo)	ug/g	0.7	<0.5	<0.5	<0.5	0.7	0.5	4377133
Acid Extractable Nickel (Ni)	ug/g	84	77	5.7	76	15	0.5	4377133
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	4377133
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	4377133
Acid Extractable Thallium (Tl)	ug/g	0.37	0.41	0.13	0.35	0.15	0.05	4377133
Acid Extractable Uranium (U)	ug/g	1.4	0.94	0.51	0.83	0.55	0.05	4377133
Acid Extractable Vanadium (V)	ug/g	110	110	9	100	18	5	4377133
Acid Extractable Zinc (Zn)	ug/g	120	120	18	110	42	5	4377133

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BVI224	BVI225	BVI226		BVI227		
Sampling Date		2016/02/09 11:30	2016/02/09 11:30	2016/02/09 10:30		2016/02/09 10:30		
COC Number		548176-02-01	548176-02-01	548176-02-01		548176-02-01		
	UNITS	**BH16-2-2**	**BH16-2-1**	**BH16-1-2**	**QC Batch**	**BH16-1-1**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A	1.0	0.52	1.1	4376618	1.4		4376618
Inorganics								
Conductivity	mS/cm	0.58	1.5	0.24	4384070	0.65	0.002	4385692
Free Cyanide	ug/g	0.02	<0.01	0.02	4382594	0.01	0.01	4382594
Available (CaCl2) pH	pH	7.60	7.68	7.61	4382808	7.62		4382808
Metals								
Soluble Calcium (Ca)	mg/L	33.9	256	12.2	4384053	57.6	0.5	4385681
Soluble Magnesium (Mg)	mg/L	24.7	38.4	9.9	4384053	11.2	0.5	4385681
Soluble Sodium (Na)	mg/L	32	34	20	4384053	46	5	4385681
Inorganics								
Chromium (VI)	ug/g	<0.2	<0.2	<0.2	4382809	<0.2	0.2	4382809
Metals								
Hot Water Ext. Boron (B)	ug/g	0.19	0.66	0.12	4382775	0.28	0.050	4385701
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	4377133	<0.2	0.2	4377133
Acid Extractable Arsenic (As)	ug/g	2	3	2	4377133	2	1	4377133
Acid Extractable Barium (Ba)	ug/g	280	360	270	4377133	240	0.5	4377133
Acid Extractable Beryllium (Be)	ug/g	0.9	0.5	1.0	4377133	0.9	0.2	4377133
Acid Extractable Boron (B)	ug/g	8	10	11	4377133	<5	5	4377133
Acid Extractable Cadmium (Cd)	ug/g	<0.1	<0.1	0.1	4377133	<0.1	0.1	4377133
Acid Extractable Chromium (Cr)	ug/g	140	13	130	4377133	89	1	4377133
Acid Extractable Cobalt (Co)	ug/g	26	4.5	24	4377133	21	0.1	4377133
Acid Extractable Copper (Cu)	ug/g	49	11	50	4377133	21	0.5	4377133
Acid Extractable Lead (Pb)	ug/g	9	9	10	4377133	10	1	4377133
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	4377133	<0.05	0.05	4377133
Acid Extractable Molybdenum (Mo)	ug/g	0.5	<0.5	<0.5	4377133	<0.5	0.5	4377133
Acid Extractable Nickel (Ni)	ug/g	75	9.2	73	4377133	35	0.5	4377133
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	<0.5	4377133	<0.5	0.5	4377133
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	4377133	<0.2	0.2	4377133
Acid Extractable Thallium (Tl)	ug/g	0.40	0.24	0.42	4377133	0.28	0.05	4377133
Acid Extractable Uranium (U)	ug/g	0.84	0.48	1.1	4377133	1.1	0.05	4377133
Acid Extractable Vanadium (V)	ug/g	100	10	99	4377133	72	5	4377133
Acid Extractable Zinc (Zn)	ug/g	120	12	120	4377133	95	5	4377133

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BVI228		
Sampling Date		2016/02/09 11:30		
COC Number		548176-02-01		
	UNITS	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters				
Sodium Adsorption Ratio	N/A	1.0		4376618
Inorganics				
Conductivity	mS/cm	0.62	0.002	4384070
Free Cyanide	ug/g	0.02	0.01	4382594
Available (CaCl2) pH	pH	7.60		4382808
Metals				
Soluble Calcium (Ca)	mg/L	35.5	0.5	4384053
Soluble Magnesium (Mg)	mg/L	26.6	0.5	4384053
Soluble Sodium (Na)	mg/L	33	5	4384053
Inorganics				
Chromium (VI)	ug/g	<0.2	0.2	4382809
Metals				
Hot Water Ext. Boron (B)	ug/g	0.18	0.050	4382775
Acid Extractable Antimony (Sb)	ug/g	<0.2	0.2	4377133
Acid Extractable Arsenic (As)	ug/g	2	1	4377133
Acid Extractable Barium (Ba)	ug/g	310	0.5	4377133
Acid Extractable Beryllium (Be)	ug/g	0.9	0.2	4377133
Acid Extractable Boron (B)	ug/g	7	5	4377133
Acid Extractable Cadmium (Cd)	ug/g	<0.1	0.1	4377133
Acid Extractable Chromium (Cr)	ug/g	130	1	4377133
Acid Extractable Cobalt (Co)	ug/g	25	0.1	4377133
Acid Extractable Copper (Cu)	ug/g	47	0.5	4377133
Acid Extractable Lead (Pb)	ug/g	8	1	4377133
Acid Extractable Mercury (Hg)	ug/g	<0.05	0.05	4377133
Acid Extractable Molybdenum (Mo)	ug/g	0.6	0.5	4377133
Acid Extractable Nickel (Ni)	ug/g	70	0.5	4377133
Acid Extractable Selenium (Se)	ug/g	<0.5	0.5	4377133
Acid Extractable Silver (Ag)	ug/g	<0.2	0.2	4377133
Acid Extractable Thallium (Tl)	ug/g	0.43	0.05	4377133
Acid Extractable Uranium (U)	ug/g	0.86	0.05	4377133
Acid Extractable Vanadium (V)	ug/g	100	5	4377133
Acid Extractable Zinc (Zn)	ug/g	120	5	4377133

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		BVI206	BVI210		
Sampling Date		2016/02/09 16:00	2016/02/09 15:15		
COC Number		548176-03-01	548176-03-01		
	UNITS	**BH16-17-1**	**BH16-15-1**	**RDL**	**QC Batch**
Calculated Parameters					
Chlordane (Total)	ug/g	<0.0020	<0.0020	0.0020	4376984
o,p-DDD + p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	4376984
o,p-DDE + p,p-DDE	ug/g	<0.0020	<0.0020	0.0020	4376984
o,p-DDT + p,p-DDT	ug/g	<0.0020	<0.0020	0.0020	4376984
Total Endosulfan	ug/g	<0.0020	<0.0020	0.0020	4376984
Total PCB	ug/g	<0.015	<0.015	0.015	4376984
Pesticides & Herbicides					
Aldrin	ug/g	<0.0020	<0.0020	0.0020	4385767
a-Chlordane	ug/g	<0.0020	<0.0020	0.0020	4385767
g-Chlordane	ug/g	<0.0020	<0.0020	0.0020	4385767
o,p-DDD	ug/g	<0.0020	<0.0020	0.0020	4385767
p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	4385767
o,p-DDE	ug/g	<0.0020	<0.0020	0.0020	4385767
p,p-DDE	ug/g	<0.0020	<0.0020	0.0020	4385767
o,p-DDT	ug/g	<0.0020	<0.0020	0.0020	4385767
p,p-DDT	ug/g	<0.0020	<0.0020	0.0020	4385767
Dieldrin	ug/g	<0.0020	<0.0020	0.0020	4385767
Lindane	ug/g	<0.0020	<0.0020	0.0020	4385767
Endosulfan I (alpha)	ug/g	<0.0020	<0.0020	0.0020	4385767
Endosulfan II (beta)	ug/g	<0.0020	<0.0020	0.0020	4385767
Endrin	ug/g	<0.0020	<0.0020	0.0020	4385767
Heptachlor	ug/g	<0.0020	<0.0020	0.0020	4385767
Heptachlor epoxide	ug/g	<0.0020	<0.0020	0.0020	4385767
Hexachlorobenzene	ug/g	<0.0020	<0.0020	0.0020	4385767
Hexachlorobutadiene	ug/g	<0.0050	<0.0050	0.0050	4385767
Hexachloroethane	ug/g	<0.0050	<0.0050	0.0050	4385767
Methoxychlor	ug/g	<0.0050	<0.0050	0.0050	4385767
Aroclor 1242	ug/g	<0.015	<0.015	0.015	4385767
Aroclor 1248	ug/g	<0.015	<0.015	0.015	4385767
Aroclor 1254	ug/g	<0.015	<0.015	0.015	4385767
Aroclor 1260	ug/g	<0.015	<0.015	0.015	4385767
Surrogate Recovery (%)					
2,4,5,6-Tetrachloro-m-xylene	%	79	74		4385767

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		BVI206	BVI210		
Sampling Date		2016/02/09 16:00	2016/02/09 15:15		
COC Number		548176-03-01	548176-03-01		
	UNITS	**BH16-17-1**	**BH16-15-1**	**RDL**	**QC Batch**
Decachlorobiphenyl	%	112	119		4385767

RDL = Reportable Detection Limit
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O.REG 153 PAHS (SOIL)

Maxxam ID		BVI206	BVI206	BVI210	BVI211	BVI212	BVI213		
Sampling Date		2016/02/09 16:00	2016/02/09 16:00	2016/02/09 15:15	2016/02/09 14:30	2016/02/09 14:30	2016/02/09 13:30		
COC Number		548176-03-01	548176-03-01	548176-03-01	548176-03-01	548176-03-01	548176-03-01		
	UNITS	**BH16-17-1**	**BH16-17-1 Lab-Dup**	**BH16-15-1**	**BH16-4-2**	**BH16-4-1**	**BH16-3-2**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	21	22	29	33	4.0	34	0.2	4378173
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.014		<0.014	<0.014	<0.014	<0.014	0.014	4376988
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(a)anthracene	ug/g	0.023	0.013	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(a)pyrene	ug/g	0.024	0.017	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(b/j)fluoranthene	ug/g	0.032	0.028	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(g,h,i)perylene	ug/g	0.016	0.0093	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(k)fluoranthene	ug/g	0.011	0.0068	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Chrysene	ug/g	0.023	0.022	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Fluoranthene	ug/g	0.056	0.041	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Indeno(1,2,3-cd)pyrene	ug/g	0.015	0.0093	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Phenanthrene	ug/g	0.022	0.020	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Pyrene	ug/g	0.048	0.037	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Surrogate Recovery (%)									
D10-Anthracene	%	85	81	88	83	82	83		4378176
D14-Terphenyl (FS)	%	85	80	86	79	78	79		4378176
D8-Acenaphthylene	%	71	68	73	69	69	67		4378176

RDL = Reportable Detection Limit
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Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 PAHS (SOIL)

Maxxam ID		BVI214	BVI224	BVI225	BVI226	BVI227	BVI228		
Sampling Date		2016/02/09 13:30	2016/02/09 11:30	2016/02/09 11:30	2016/02/09 10:30	2016/02/09 10:30	2016/02/09 11:30		
COC Number		548176-03-01	548176-02-01	548176-02-01	548176-02-01	548176-02-01	548176-02-01		
	UNITS	**BH16-3-1**	**BH16-2-2**	**BH16-2-1**	**BH16-1-2**	**BH16-1-1**	**DUP-1**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	5.0	40	5.9	32	24	38	0.2	4378173
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.014	4376988
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4378176
Surrogate Recovery (%)									
D10-Anthracene	%	84	88	88	84	84	87		4378176
D14-Terphenyl (FS)	%	81	84	86	82	82	84		4378176
D8-Acenaphthylene	%	70	72	74	70	70	72		4378176

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BVI206		BVI210	BVI211		BVI212		
Sampling Date		2016/02/09 16:00		2016/02/09 15:15	2016/02/09 14:30		2016/02/09 14:30		
COC Number		548176-03-01		548176-03-01	548176-03-01		548176-03-01		
	UNITS	**BH16-17-1**	**RDL**	**BH16-15-1**	**BH16-4-2**	**RDL**	**BH16-4-1**	**RDL**	**QC Batch**
Volatile Organics									
Acetone (2-Propanone)	ug/g	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	4377761
Benzene	ug/g	<0.020	0.020	<0.020	<0.020	0.020	<0.020	0.020	4377761
Bromodichloromethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Bromoform	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Bromomethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Carbon Tetrachloride	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Chlorobenzene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Chloroform	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Dibromochloromethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,2-Dichlorobenzene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,3-Dichlorobenzene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,4-Dichlorobenzene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,1-Dichloroethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,2-Dichloroethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,1-Dichloroethylene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,2-Dichloropropane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	<0.030	<0.030	0.030	<0.030	0.030	4377761
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	<0.040	<0.040	0.040	<0.040	0.040	4377761
Ethylbenzene	ug/g	<0.020	0.020	<0.020	<0.020	0.020	<0.020	0.020	4377761
Ethylene Dibromide	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Hexane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	0.11	0.050	4377761
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	4377761
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	4377761
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Styrene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Tetrachloroethylene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Toluene	ug/g	<0.020	0.020	<0.020	<0.020	0.020	0.025	0.020	4377761

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BVI206		BVI210	BVI211		BVI212		
Sampling Date		2016/02/09 16:00		2016/02/09 15:15	2016/02/09 14:30		2016/02/09 14:30		
COC Number		548176-03-01		548176-03-01	548176-03-01		548176-03-01		
	UNITS	**BH16-17-1**	**RDL**	**BH16-15-1**	**BH16-4-2**	**RDL**	**BH16-4-1**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
1,1,2-Trichloroethane	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Trichloroethylene	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4377761
Vinyl Chloride	ug/g	<0.020	0.020	<0.020	<0.020	0.020	<0.020	0.020	4377761
p+m-Xylene	ug/g	<0.020	0.020	<0.020	<0.020	0.020	0.029	0.020	4377761
o-Xylene	ug/g	<0.020	0.020	<0.020	<0.020	0.020	<0.020	0.020	4377761
Total Xylenes	ug/g	<0.020	0.020	<0.020	<0.020	0.020	0.029	0.020	4377761
BTEX & F1 Hydrocarbons									
F1 (C6-C10)	ug/g	<10	10	<20	<20	20	<10	10	4382610
F1 (C6-C10) - BTEX	ug/g	<10	10	<20	<20	20	<10	10	4382610
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	<10	<10	10	<10	10	4380157
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	<50	<50	50	<50	50	4380157
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	<50	<50	50	<50	50	4380157
Reached Baseline at C50	ug/g	Yes		Yes	Yes		Yes		4380157
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	95		99	97		94		4382610
4-Bromofluorobenzene	%	101		101	103		96		4382610
D10-Ethylbenzene	%	79		92	85		85		4382610
D4-1,2-Dichloroethane	%	98		99	101		98		4382610
o-Terphenyl	%	110		107	107		107		4380157
4-Bromofluorobenzene	%	94		93	93		94		4377761
D10-o-Xylene	%	92		96	98		96		4377761
D4-1,2-Dichloroethane	%	101		99	99		98		4377761
D8-Toluene	%	95		95	95		96		4377761

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BVI213		BVI214		BVI224		BVI225		
Sampling Date		2016/02/09 13:30		2016/02/09 13:30		2016/02/09 11:30		2016/02/09 11:30		
COC Number		548176-03-01		548176-03-01		548176-02-01		548176-02-01		
	UNITS	**BH16-3-2**	**RDL**	**BH16-3-1**	**RDL**	**BH16-2-2**	**RDL**	**BH16-2-1**	**RDL**	**QC Batch**
Volatile Organics										
Acetone (2-Propanone)	ug/g	<1.0	1.0	<0.50	0.50	<1.0	1.0	<0.50	0.50	4377761
Benzene	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	4377761
Bromodichloromethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Bromoform	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Bromomethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Carbon Tetrachloride	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Chlorobenzene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Chloroform	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Dibromochloromethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,2-Dichlorobenzene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,3-Dichlorobenzene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,4-Dichlorobenzene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Dichlorodifluoromethane (FREON 12)	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,1-Dichloroethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,2-Dichloroethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,1-Dichloroethylene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
cis-1,2-Dichloroethylene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
trans-1,2-Dichloroethylene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,2-Dichloropropane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
cis-1,3-Dichloropropene	ug/g	<0.060	0.060	<0.030	0.030	<0.060	0.060	<0.030	0.030	4377761
trans-1,3-Dichloropropene	ug/g	<0.080	0.080	<0.040	0.040	<0.080	0.080	<0.040	0.040	4377761
Ethylbenzene	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	4377761
Ethylene Dibromide	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Hexane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	0.084	0.050	4377761
Methylene Chloride(Dichloromethane)	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Methyl Ethyl Ketone (2-Butanone)	ug/g	<1.0	1.0	<0.50	0.50	<1.0	1.0	<0.50	0.50	4377761
Methyl Isobutyl Ketone	ug/g	<1.0	1.0	<0.50	0.50	<1.0	1.0	<0.50	0.50	4377761
Methyl t-butyl ether (MTBE)	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Styrene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,1,1,2-Tetrachloroethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,1,2,2-Tetrachloroethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Tetrachloroethylene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Toluene	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	0.024	0.020	4377761

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BVI213		BVI214		BVI224		BVI225		
Sampling Date		2016/02/09 13:30		2016/02/09 13:30		2016/02/09 11:30		2016/02/09 11:30		
COC Number		548176-03-01		548176-03-01		548176-02-01		548176-02-01		
	UNITS	**BH16-3-2**	**RDL**	**BH16-3-1**	**RDL**	**BH16-2-2**	**RDL**	**BH16-2-1**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
1,1,2-Trichloroethane	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Trichloroethylene	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Trichlorofluoromethane (FREON 11)	ug/g	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.050	0.050	4377761
Vinyl Chloride	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	4377761
p+m-Xylene	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	0.025	0.020	4377761
o-Xylene	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	<0.020	0.020	4377761
Total Xylenes	ug/g	<0.040	0.040	<0.020	0.020	<0.040	0.040	0.025	0.020	4377761
BTEX & F1 Hydrocarbons										
F1 (C6-C10)	ug/g	<20	20	<10	10	<30	30	<20	20	4382610
F1 (C6-C10) - BTEX	ug/g	<20	20	<10	10	<30	30	<20	20	4382610
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	<10	10	<20	20	<10	10	4380157
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	<50	50	<100	100	<50	50	4380157
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	<50	50	<100	100	<50	50	4380157
Reached Baseline at C50	ug/g	Yes		Yes		Yes		Yes		4380157
Surrogate Recovery (%)										
1,4-Difluorobenzene	%	97		93		92		93		4382610
4-Bromofluorobenzene	%	100		96		99		100		4382610
D10-Ethylbenzene	%	82		84		88		84		4382610
D4-1,2-Dichloroethane	%	99		100		96		98		4382610
o-Terphenyl	%	107		106		108		109		4380157
4-Bromofluorobenzene	%	94		96		94		94		4377761
D10-o-Xylene	%	101		96		96		95		4377761
D4-1,2-Dichloroethane	%	99		99		100		99		4377761
D8-Toluene	%	95		95		94		95		4377761

RDL = Reportable Detection Limit
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Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BVI226		BVI227		BVI228		
Sampling Date		2016/02/09 10:30		2016/02/09 10:30		2016/02/09 11:30		
COC Number		548176-02-01		548176-02-01		548176-02-01		
	UNITS	**BH16-1-2**	**RDL**	**BH16-1-1**	**RDL**	**DUP-1**	**RDL**	**QC Batch**
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.50	0.50	<0.50	0.50	<1.0	1.0	4377761
Benzene	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761
Bromodichloromethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Bromoform	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Bromomethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Carbon Tetrachloride	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Chlorobenzene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Chloroform	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Dibromochloromethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,2-Dichlorobenzene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,3-Dichlorobenzene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,4-Dichlorobenzene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,1-Dichloroethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,2-Dichloroethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,1-Dichloroethylene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,2-Dichloropropane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	<0.030	0.030	<0.060	0.060	4377761
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	<0.040	0.040	<0.080	0.080	4377761
Ethylbenzene	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761
Ethylene Dibromide	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Hexane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	<0.50	0.50	<1.0	1.0	4377761
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	<0.50	0.50	<1.0	1.0	4377761
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Styrene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Tetrachloroethylene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Toluene	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
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ARCADIS Canada Inc
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O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BVI226		BVI227		BVI228		
Sampling Date		2016/02/09 10:30		2016/02/09 10:30		2016/02/09 11:30		
COC Number		548176-02-01		548176-02-01		548176-02-01		
	UNITS	**BH16-1-2**	**RDL**	**BH16-1-1**	**RDL**	**DUP-1**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
1,1,2-Trichloroethane	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Trichloroethylene	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	<0.050	0.050	<0.10	0.10	4377761
Vinyl Chloride	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761
p+m-Xylene	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761
o-Xylene	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761
Total Xylenes	ug/g	<0.020	0.020	<0.020	0.020	<0.040	0.040	4377761
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/g	<20	20	<10	10	<20	20	4382610
F1 (C6-C10) - BTEX	ug/g	<20	20	<10	10	<20	20	4382610
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	<10	10	<10	10	4380157
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	<50	50	<50	50	4380157
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	<50	50	<50	50	4380157
Reached Baseline at C50	ug/g	Yes		Yes		Yes		4380157
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	97		94		93		4382610
4-Bromofluorobenzene	%	101		101		97		4382610
D10-Ethylbenzene	%	90		85		81		4382610
D4-1,2-Dichloroethane	%	104		100		98		4382610
o-Terphenyl	%	100		106		113		4380157
4-Bromofluorobenzene	%	94		94		93		4377761
D10-o-Xylene	%	98		100		100		4377761
D4-1,2-Dichloroethane	%	99		100		100		4377761
D8-Toluene	%	94		94		95		4377761

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
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Sampler Initials: AW

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID		BVI206	BVI210	BVI211	BVI212		BVI213		
Sampling Date		2016/02/09 16:00	2016/02/09 15:15	2016/02/09 14:30	2016/02/09 14:30		2016/02/09 13:30		
COC Number		548176-03-01	548176-03-01	548176-03-01	548176-03-01		548176-03-01		
	UNITS	**BH16-17-1**	**BH16-15-1**	**BH16-4-2**	**BH16-4-1**	**RDL**	**BH16-3-2**	**RDL**	**QC Batch**
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	<0.050	0.050	<0.10	0.10	4376564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BVI214		BVI224		BVI225	BVI226	BVI227		
Sampling Date		2016/02/09 13:30		2016/02/09 11:30		2016/02/09 11:30	2016/02/09 10:30	2016/02/09 10:30		
COC Number		548176-03-01		548176-02-01		548176-02-01	548176-02-01	548176-02-01		
	UNITS	**BH16-3-1**	**RDL**	**BH16-2-2**	**RDL**	**BH16-2-1**	**BH16-1-2**	**BH16-1-1**	**RDL**	**QC Batch**
Calculated Parameters										
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	<0.10	0.10	<0.050	<0.050	<0.050	0.050	4376564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BVI228		
Sampling Date		2016/02/09 11:30		
COC Number		548176-02-01		
	UNITS	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.10	0.10	4376564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: BVI205
Sample ID: BH16-17-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
Moisture	BAL	4381620	N/A	2016/02/13	Shivani Desai
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli

Maxxam ID: BVI206
Sample ID: BH16-17-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
OC Pesticides (Selected) & PCB	GC/ECD	4385767	2016/02/18	2016/02/22	Mahmudul Khan
OC Pesticides Summed Parameters	CALC	4376984	N/A	2016/02/12	Cristina Carriere
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/11	Anna Gabrielyan

Maxxam ID: BVI206 Dup
Sample ID: BH16-17-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici

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Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
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TEST SUMMARY

Maxxam ID: BVI207
Sample ID: BH16-16-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
Moisture	BAL	4381620	N/A	2016/02/13	Shivani Desai
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli

Maxxam ID: BVI208
Sample ID: BH16-16-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
Moisture	BAL	4381620	N/A	2016/02/13	Shivani Desai
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli

Maxxam ID: BVI209
Sample ID: BH16-15-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
Moisture	BAL	4381620	N/A	2016/02/13	Shivani Desai
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli

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Report Date: 2016/02/22

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Site Location: 1830 TRIM RD.
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: BVI210
Sample ID: BH16-15-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
OC Pesticides (Selected) & PCB	GC/ECD	4385767	2016/02/18	2016/02/22	Mahmudul Khan
OC Pesticides Summed Parameters	CALC	4376984	N/A	2016/02/12	Cristina Carriere
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/11	Anna Gabrielyan

Maxxam ID: BVI211
Sample ID: BH16-4-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/17	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/11	Anna Gabrielyan

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TEST SUMMARY

Maxxam ID: BVI212
Sample ID: BH16-4-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/11	Anna Gabrielyan

Maxxam ID: BVI213
Sample ID: BH16-3-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/11	Anna Gabrielyan

Maxxam ID: BVI214
Sample ID: BH16-3-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai

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Site Location: 1830 TRIM RD.
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: BVI214
Sample ID: BH16-3-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/12	Anna Gabrielyan

Maxxam ID: BVI224
Sample ID: BH16-2-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/12	Anna Gabrielyan

Maxxam ID: BVI225
Sample ID: BH16-2-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu

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Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: BVI225
Sample ID: BH16-2-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/12	Anna Gabrielyan

Maxxam ID: BVI226
Sample ID: BH16-1-2
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/12	Anna Gabrielyan

Maxxam ID: BVI227
Sample ID: BH16-1-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4385701	2016/02/18	2016/02/18	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4385692	N/A	2016/02/18	Neil Dassanayake
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera

Maxxam Job #: B627697
Report Date: 2016/02/22

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Client Project #: 450271-000
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TEST SUMMARY

Maxxam ID: BVI227
Sample ID: BH16-1-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/18	Automated Statchk
SAR - ICP Metals	ICP	4385681	2016/02/18	2016/02/18	Suban Kanapathippllai
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/12	Anna Gabrielyan

Maxxam ID: BVI228
Sample ID: DUP-1
Matrix: Soil

Collected: 2016/02/09
Shipped:
Received: 2016/02/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4376988	N/A	2016/02/12	Steve Roberts
Hot Water Extractable Boron	ICP	4382775	2016/02/16	2016/02/16	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4376564	N/A	2016/02/17	Automated Statchk
Free (WAD) Cyanide	TECH	4382594	2016/02/16	2016/02/17	Xuanhong Qiu
Conductivity	AT	4384070	N/A	2016/02/17	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4382809	2016/02/16	2016/02/17	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4382610	N/A	2016/02/16	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4380157	2016/02/12	2016/02/12	Barbara Wowk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4377133	2016/02/10	2016/02/11	Raigamage Perera
MOISTURE	BAL	4378173	N/A	2016/02/12	Liliana Gaburici
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4378176	2016/02/11	2016/02/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4382808	2016/02/16	2016/02/16	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4376618	N/A	2016/02/17	Automated Statchk
SAR - ICP Metals	ICP	4384053	2016/02/17	2016/02/17	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4377761	N/A	2016/02/12	Anna Gabrielyan

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GENERAL COMMENTS

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

Package 1	0.0°C
Package 2	0.0°C

Custody seal was present and intact on the cooler.

Sample BVI210-01 : F1/btex-analysis: Detection limits were adjusted for sample weight.

Sample BVI211-01 : F1/btex-analysis: Detection limits were adjusted for sample weight.

Sample BVI213-01 : F1/btex-analysis: Detection limits were adjusted for sample weight.

VOC Analysis: Detection limits were raised due to high moisture content and low weight of soil provided.

Sample BVI224-01 : F2-F4 & F1/BTEX Analysis: Detection limits were adjusted for high moisture content.

VOC Analysis: Detection limits were raised due to high moisture content of soil provided.

Sample BVI225-01 : F1/btex-analysis: Detection limits were adjusted for sample weight.

Sample BVI226-01 : F1/btex-analysis: Detection limits were adjusted for sample weight.

Sample BVI228-01 : F1/btex-analysis: Detection limits were adjusted for sample weight.

VOC Analysis: Detection limits were raised due to high moisture content of soil provided.

Results relate only to the items tested.

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Report Date: 2016/02/22

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4377761	4-Bromofluorobenzene	2016/02/11	103	60 - 140	104	60 - 140	96	%				
4377761	D10-o-Xylene	2016/02/11	113	60 - 130	121	60 - 130	107	%				
4377761	D4-1,2-Dichloroethane	2016/02/11	98	60 - 140	101	60 - 140	104	%				
4377761	D8-Toluene	2016/02/11	99	60 - 140	103	60 - 140	93	%				
4378176	D10-Anthracene	2016/02/12	83	50 - 130	88	50 - 130	92	%				
4378176	D14-Terphenyl (FS)	2016/02/12	77	50 - 130	85	50 - 130	82	%				
4378176	D8-Acenaphthylene	2016/02/12	69	50 - 130	83	50 - 130	72	%				
4380157	o-Terphenyl	2016/02/12	102	60 - 130	103	60 - 130	108	%				
4382610	1,4-Difluorobenzene	2016/02/16	101	60 - 140	93	60 - 140	98	%				
4382610	4-Bromofluorobenzene	2016/02/16	102	60 - 140	100	60 - 140	102	%				
4382610	D10-Ethylbenzene	2016/02/16	113	60 - 140	86	60 - 140	90	%				
4382610	D4-1,2-Dichloroethane	2016/02/16	102	60 - 140	97	60 - 140	98	%				
4385767	2,4,5,6-Tetrachloro-m-xylene	2016/02/22	93	50 - 130	86	50 - 130	78	%				
4385767	Decachlorobiphenyl	2016/02/22	126	50 - 130	125	50 - 130	126	%				
4377133	Acid Extractable Antimony (Sb)	2016/02/11	89	75 - 125	100	80 - 120	<0.2	ug/g				
4377133	Acid Extractable Arsenic (As)	2016/02/11	94	75 - 125	100	80 - 120	<1	ug/g	NC	35		
4377133	Acid Extractable Barium (Ba)	2016/02/11	NC	75 - 125	103	80 - 120	<0.5	ug/g				
4377133	Acid Extractable Beryllium (Be)	2016/02/11	95	75 - 125	102	80 - 120	<0.2	ug/g				
4377133	Acid Extractable Boron (B)	2016/02/11	93	75 - 125	101	80 - 120	<5	ug/g				
4377133	Acid Extractable Cadmium (Cd)	2016/02/11	95	75 - 125	103	80 - 120	<0.1	ug/g	NC	35		
4377133	Acid Extractable Chromium (Cr)	2016/02/11	NC	75 - 125	100	80 - 120	<1	ug/g	6.4	35		
4377133	Acid Extractable Cobalt (Co)	2016/02/11	94	75 - 125	102	80 - 120	<0.1	ug/g				
4377133	Acid Extractable Copper (Cu)	2016/02/11	NC	75 - 125	102	80 - 120	<0.5	ug/g				
4377133	Acid Extractable Lead (Pb)	2016/02/11	NC	75 - 125	106	80 - 120	<1	ug/g	5.1	35		
4377133	Acid Extractable Mercury (Hg)	2016/02/11	93	75 - 125	102	80 - 120	<0.05	ug/g				
4377133	Acid Extractable Molybdenum (Mo)	2016/02/11	94	75 - 125	104	80 - 120	<0.5	ug/g				
4377133	Acid Extractable Nickel (Ni)	2016/02/11	NC	75 - 125	103	80 - 120	<0.5	ug/g				
4377133	Acid Extractable Selenium (Se)	2016/02/11	96	75 - 125	105	80 - 120	<0.5	ug/g				
4377133	Acid Extractable Silver (Ag)	2016/02/11	92	75 - 125	104	80 - 120	<0.2	ug/g				
4377133	Acid Extractable Thallium (Tl)	2016/02/11	94	75 - 125	105	80 - 120	<0.05	ug/g				
4377133	Acid Extractable Uranium (U)	2016/02/11	93	75 - 125	101	80 - 120	<0.05	ug/g				

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4377133	Acid Extractable Vanadium (V)	2016/02/11	NC	75 - 125	101	80 - 120	<5	ug/g				
4377133	Acid Extractable Zinc (Zn)	2016/02/11	NC	75 - 125	103	80 - 120	<5	ug/g	1.0	35		
4377761	1,1,1,2-Tetrachloroethane	2016/02/11	95	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4377761	1,1,1-Trichloroethane	2016/02/11	90	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4377761	1,1,2,2-Tetrachloroethane	2016/02/11	92	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4377761	1,1,2-Trichloroethane	2016/02/11	89	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4377761	1,1-Dichloroethane	2016/02/11	87	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4377761	1,1-Dichloroethylene	2016/02/11	89	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4377761	1,2-Dichlorobenzene	2016/02/11	95	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4377761	1,2-Dichloroethane	2016/02/11	89	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4377761	1,2-Dichloropropane	2016/02/11	87	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4377761	1,3-Dichlorobenzene	2016/02/11	94	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4377761	1,4-Dichlorobenzene	2016/02/11	95	60 - 140	93	60 - 130	<0.050	ug/g	NC	50		
4377761	Acetone (2-Propanone)	2016/02/11	86	60 - 140	117	60 - 140	<0.50	ug/g	NC	50		
4377761	Benzene	2016/02/11	89	60 - 140	96	60 - 130	<0.020	ug/g	NC	50		
4377761	Bromodichloromethane	2016/02/11	92	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4377761	Bromoform	2016/02/11	92	60 - 140	95	60 - 130	<0.050	ug/g	NC	50		
4377761	Bromomethane	2016/02/11	86	60 - 140	88	60 - 140	<0.050	ug/g	NC	50		
4377761	Carbon Tetrachloride	2016/02/11	93	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4377761	Chlorobenzene	2016/02/11	91	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4377761	Chloroform	2016/02/11	91	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4377761	cis-1,2-Dichloroethylene	2016/02/11	88	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4377761	cis-1,3-Dichloropropene	2016/02/11	94	60 - 140	91	60 - 130	<0.030	ug/g	NC	50		
4377761	Dibromochloromethane	2016/02/11	93	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4377761	Dichlorodifluoromethane (FREON 12)	2016/02/11	89	60 - 140	85	60 - 140	<0.050	ug/g	NC	50		
4377761	Ethylbenzene	2016/02/11	91	60 - 140	96	60 - 130	<0.020	ug/g	NC	50		
4377761	Ethylene Dibromide	2016/02/11	89	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4377761	Hexane	2016/02/11	91	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4377761	Methyl Ethyl Ketone (2-Butanone)	2016/02/11	82	60 - 140	110	60 - 140	<0.50	ug/g	NC	50		
4377761	Methyl Isobutyl Ketone	2016/02/11	80	60 - 140	101	60 - 130	<0.50	ug/g	NC	50		
4377761	Methyl t-butyl ether (MTBE)	2016/02/11	89	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4377761	Methylene Chloride(Dichloromethane)	2016/02/11	86	60 - 140	94	60 - 130	<0.050	ug/g	NC	50		
4377761	o-Xylene	2016/02/11	87	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
4377761	p+m-Xylene	2016/02/11	89	60 - 140	95	60 - 130	<0.020	ug/g	NC	50		
4377761	Styrene	2016/02/11	85	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4377761	Tetrachloroethylene	2016/02/11	96	60 - 140	95	60 - 130	<0.050	ug/g	NC	50		
4377761	Toluene	2016/02/11	88	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
4377761	Total Xylenes	2016/02/11					<0.020	ug/g	NC	50		
4377761	trans-1,2-Dichloroethylene	2016/02/11	88	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4377761	trans-1,3-Dichloropropene	2016/02/11	97	60 - 140	93	60 - 130	<0.040	ug/g	NC	50		
4377761	Trichloroethylene	2016/02/11	95	60 - 140	95	60 - 130	<0.050	ug/g	NC	50		
4377761	Trichlorofluoromethane (FREON 11)	2016/02/11	95	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4377761	Vinyl Chloride	2016/02/11	90	60 - 140	96	60 - 130	<0.020	ug/g	NC	50		
4378173	Moisture	2016/02/12							0.47	50		
4378176	1-Methylnaphthalene	2016/02/12	77	50 - 130	79	50 - 130	<0.0050	ug/g	NC	40		
4378176	2-Methylnaphthalene	2016/02/12	76	50 - 130	78	50 - 130	<0.0050	ug/g	NC	40		
4378176	Acenaphthene	2016/02/12	76	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40		
4378176	Acenaphthylene	2016/02/12	65	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4378176	Anthracene	2016/02/12	80	50 - 130	76	50 - 130	<0.0050	ug/g	NC	40		
4378176	Benzo(a)anthracene	2016/02/12	71	50 - 130	74	50 - 130	<0.0050	ug/g	NC	40		
4378176	Benzo(a)pyrene	2016/02/12	75	50 - 130	82	50 - 130	<0.0050	ug/g	NC	40		
4378176	Benzo(b/j)fluoranthene	2016/02/12	78	50 - 130	81	50 - 130	<0.0050	ug/g	15	40		
4378176	Benzo(g,h,i)perylene	2016/02/12	66	50 - 130	74	50 - 130	<0.0050	ug/g	NC	40		
4378176	Benzo(k)fluoranthene	2016/02/12	77	50 - 130	74	50 - 130	<0.0050	ug/g	NC	40		
4378176	Chrysene	2016/02/12	71	50 - 130	76	50 - 130	<0.0050	ug/g	NC	40		
4378176	Dibenz(a,h)anthracene	2016/02/12	66	50 - 130	73	50 - 130	<0.0050	ug/g	NC	40		
4378176	Fluoranthene	2016/02/12	79	50 - 130	80	50 - 130	<0.0050	ug/g	30	40		
4378176	Fluorene	2016/02/12	75	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40		
4378176	Indeno(1,2,3-cd)pyrene	2016/02/12	71	50 - 130	76	50 - 130	<0.0050	ug/g	NC	40		
4378176	Naphthalene	2016/02/12	76	50 - 130	72	50 - 130	<0.0050	ug/g	NC	40		
4378176	Phenanthrene	2016/02/12	74	50 - 130	76	50 - 130	<0.0050	ug/g	NC	40		
4378176	Pyrene	2016/02/12	78	50 - 130	80	50 - 130	<0.0050	ug/g	26	40		

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Maxxam Job #: B627697
Report Date: 2016/02/22

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4380157	F2 (C10-C16 Hydrocarbons)	2016/02/12	95	50 - 130	95	80 - 120	<10	ug/g	NC	30		
4380157	F3 (C16-C34 Hydrocarbons)	2016/02/12	100	50 - 130	101	80 - 120	<50	ug/g	NC	30		
4380157	F4 (C34-C50 Hydrocarbons)	2016/02/12	100	50 - 130	100	80 - 120	<50	ug/g	NC	30		
4381620	Moisture	2016/02/13							3.8	20		
4382594	Free Cyanide	2016/02/17	103	75 - 125	100	80 - 120	0.01, RDL=0.01	ug/g	NC	35		
4382610	F1 (C6-C10) - BTEX	2016/02/16					<10	ug/g	5.0	30		
4382610	F1 (C6-C10)	2016/02/16	95	60 - 140	100	80 - 120	<10	ug/g	5.0	30		
4382775	Hot Water Ext. Boron (B)	2016/02/16	95	75 - 125	93	75 - 125	<0.050	ug/g	NC	40		
4382808	Available (CaCl2) pH	2016/02/16			98	97 - 103			0.025	N/A		
4382809	Chromium (VI)	2016/02/17	84	75 - 125	100	80 - 120	<0.2	ug/g	NC	35	92	75 - 125
4384053	Soluble Calcium (Ca)	2016/02/17			98	80 - 120	<0.5	mg/L				
4384053	Soluble Magnesium (Mg)	2016/02/17			96	80 - 120	<0.5	mg/L				
4384053	Soluble Sodium (Na)	2016/02/17			106	80 - 120	<5	mg/L				
4384070	Conductivity	2016/02/17			100	90 - 110	<0.002	mS/cm	0.22	10		
4385681	Soluble Calcium (Ca)	2016/02/18			94	80 - 120	<0.5	mg/L	0.41	30		
4385681	Soluble Magnesium (Mg)	2016/02/18			94	80 - 120	<0.5	mg/L	0.44	30		
4385681	Soluble Sodium (Na)	2016/02/18			99	80 - 120	<5	mg/L	0.23	30		
4385692	Conductivity	2016/02/18			100	90 - 110	<0.002	mS/cm	1.1	10		
4385701	Hot Water Ext. Boron (B)	2016/02/18	97	75 - 125	95	75 - 125	<0.050	ug/g	NC	40		
4385767	a-Chlordane	2016/02/22	100	50 - 130	83	50 - 130	<0.0020	ug/g	NC	40		
4385767	Aldrin	2016/02/22	93	50 - 130	88	50 - 130	<0.0020	ug/g	NC	40		
4385767	Aroclor 1242	2016/02/22					<0.015	ug/g	NC	40		
4385767	Aroclor 1248	2016/02/22					<0.015	ug/g	NC	40		
4385767	Aroclor 1254	2016/02/22					<0.015	ug/g	NC	40		
4385767	Aroclor 1260	2016/02/22					<0.015	ug/g	NC	40		
4385767	Dieldrin	2016/02/22	92	50 - 130	69	50 - 130	<0.0020	ug/g	NC	40		
4385767	Endosulfan I (alpha)	2016/02/22	84	50 - 130	68	50 - 130	<0.0020	ug/g	NC	40		
4385767	Endosulfan II (beta)	2016/02/22	99	50 - 130	72	50 - 130	<0.0020	ug/g	NC	40		
4385767	Endrin	2016/02/22	95	50 - 130	74	50 - 130	<0.0020	ug/g	NC	40		
4385767	g-Chlordane	2016/02/22	89	50 - 130	73	50 - 130	<0.0020	ug/g	NC	40		

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Maxxam Job #: B627697
Report Date: 2016/02/22

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4385767	Heptachlor epoxide	2016/02/22	94	50 - 130	74	50 - 130	<0.0020	ug/g	NC	40		
4385767	Heptachlor	2016/02/22	88	50 - 130	92	50 - 130	<0.0020	ug/g	NC	40		
4385767	Hexachlorobenzene	2016/02/22	94	50 - 130	88	50 - 130	<0.0020	ug/g	NC	40		
4385767	Hexachlorobutadiene	2016/02/22	62	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40		
4385767	Hexachloroethane	2016/02/22	39 (2)	50 - 130	75	50 - 130	<0.0050	ug/g	NC	40		
4385767	Lindane	2016/02/22	90	50 - 130	68	50 - 130	<0.0020	ug/g	NC	40		
4385767	Methoxychlor	2016/02/22	153 (1)	50 - 130	120	50 - 130	<0.0050	ug/g	NC	40		
4385767	o,p-DDD	2016/02/22	109	50 - 130	84	50 - 130	<0.0020	ug/g	NC	40		
4385767	o,p-DDE	2016/02/22	98	50 - 130	95	50 - 130	<0.0020	ug/g	NC	40		
4385767	o,p-DDT	2016/02/22	115	50 - 130	108	50 - 130	<0.0020	ug/g	NC	40		
4385767	p,p-DDD	2016/02/22	102	50 - 130	77	50 - 130	<0.0020	ug/g	NC	40		
4385767	p,p-DDE	2016/02/22	92	50 - 130	89	50 - 130	<0.0020	ug/g	NC	40		
4385767	p,p-DDT	2016/02/22	132 (1)	50 - 130	118	50 - 130	<0.0020	ug/g	NC	40		

N/A = Not Applicable

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

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte. For results that were not detected (ND), this potential bias has no impact.

(2) The recovery for the flagged target analyte was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported for this specific analyte with spike recoveries within this range are still valid but may have an associated low bias.

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Maxxam Job #: B627697
Report Date: 2016/02/22

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD.
Sampler Initials: AW

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Scientific Services

Steve Roberts, Ottawa Lab Manager

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

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CHAIN OF CUSTODY RECORD

Page 1 of 2

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B60807	Maxxam Job #:	Bottle Order #:
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			548176
Address:	329 Churchill Ave N Suite 200	Address:		Project:	450271-000	COC #:	Project Manager:
	Ottawa ON K1Z 5B8			Project Name:	1830 Trim Rd.	C#548176-03-01	Parnian Baber
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Site #:			
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Sampled By:	A.Williamson		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☑ For RSC; ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558. ☐ Storm Sewer Bylaw; ☐ MISA Municipality ___; ☐ PWQO; ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs & F1-F4 (Soil)	O.Reg 153 OC Pesticides (Soil)	O.Reg 153 Metals & Inorganics Pkg (Wtr)	O.Reg 153 PAHs (Water)	O.Reg 153 VOCs & F1-F4 (Water)	O.Reg 153 OC Pesticides (Water)	pH (soil)		# of Bottles	Comments
1		BH16-17-2	Feb. 9 2016	16:00	Soil		✓										1	1 bag
2		BH16-17-1	"	16:00	"		✓	✓	✓	✓							7	6 bottles, 1 bag
3		BH16-16-2	"	15:40	"		✓										1	1 bag
4		BH16-16-1	"	15:40	"		✓										1	1 bag
5		BH16-15-2	"	15:15	"		✓										1	1 bag
6		BH16-15-1	"	15:15	"		✓	✓	✓	✓							7	6 bottles, 1 bag
7		BH16-4-2	"	14:30	"		✓	✓	✓						✓		~~6~~ 7	6 bottles, 1 bag
8		BH16-4-1	"	14:30	"		✓	✓	✓						✓		~~6~~ 7	6 bottles, 1 bag
9		BH16-3-2	"	1:30 Pm	"		✓	✓	✓								6	5 bottles, 1 bag
10		BH16-3-1	"	1:30 Pm	"		✓	✓	✓								6	5 bottles, 1 bag

10-Feb-16 09:41
Parnian Baber
B627697
FHB OTT-002

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alisha Williamson	Feb 10 2016	9:30	Kelsey Pilon Kelsey Pilon	16/02/10	9:41	
Alisha Williamson						

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	0,0,0 0,0,6	Present	✓	
		Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B60807	Maxxam Job #:	Bottle Order #:
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			548176
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Project Name:	1830 Trim Rd.	C#548176-02-01	Parnian Baber
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	A.WilliamSon		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other ☑ For RSC
☐ Table ___

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg 558. ☐ Storm Sewer Bylaw
☐ MISA Municipality ___
☐ PWQO
☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O Reg 153 Metals & Inorganics Pkg (Soil)	O Reg 153 PAHs (Soil)	O Reg 153 VOCs & F1-F4 (Soil)	O Reg 153 OC Pesticides (Soil)	O Reg 153 Metals & Inorganics Pkg (Wtr)	O Reg 153 PAHs (Water)	O Reg 153 VOCs & F1-F4 (Water)	O Reg 153 OC Pesticides (Water)	# of Bottles	Comments
1		BH16-2-2	Feb. 9 2016	11:30	Soil		✓	✓	✓						6	5 bottles, 1 bag Limited Sample for metals
2		BH16-2-1	"	11:30	"		✓	✓	✓						6	"
3		BH16-1-2	"	10:30	"		✓	✓	✓						6	"
4		BH16-1-1	"	10:30	"		✓	✓	✓						6	5 bottles, 1 bag Limited Sample for metals
5		DUP-1	"	11:30	"		✓	✓	✓							
6																
7																
8																
9																
10																RECEIVED IN OTTAWA

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alisha Williamson	Feb. 10 2016	9:30	Kelsey Pilon Kelsey Pilon	16/02/10	9:41	
Shishal						

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	0,0,0 0,0,0	Present	✓	
		Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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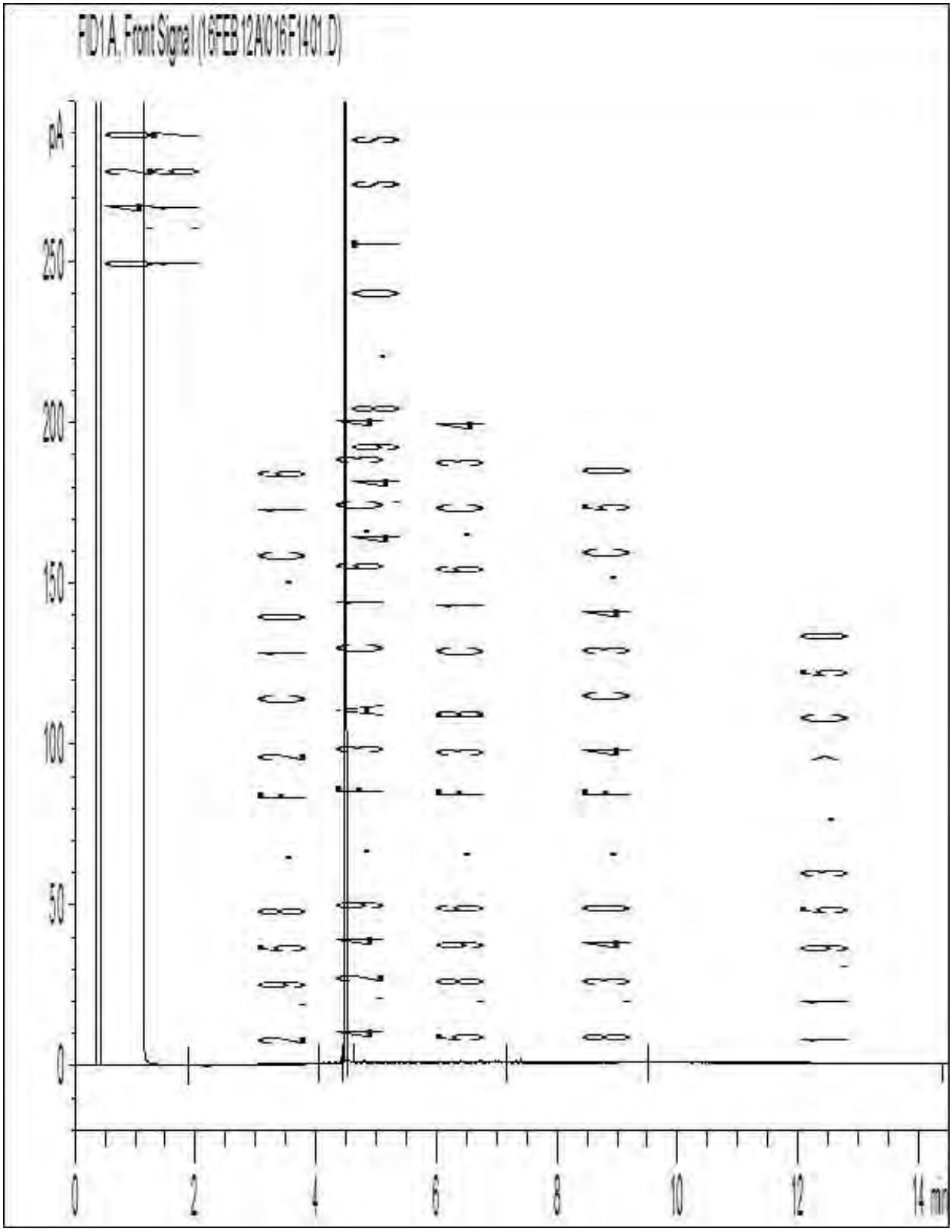
onic

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI206

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-17-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

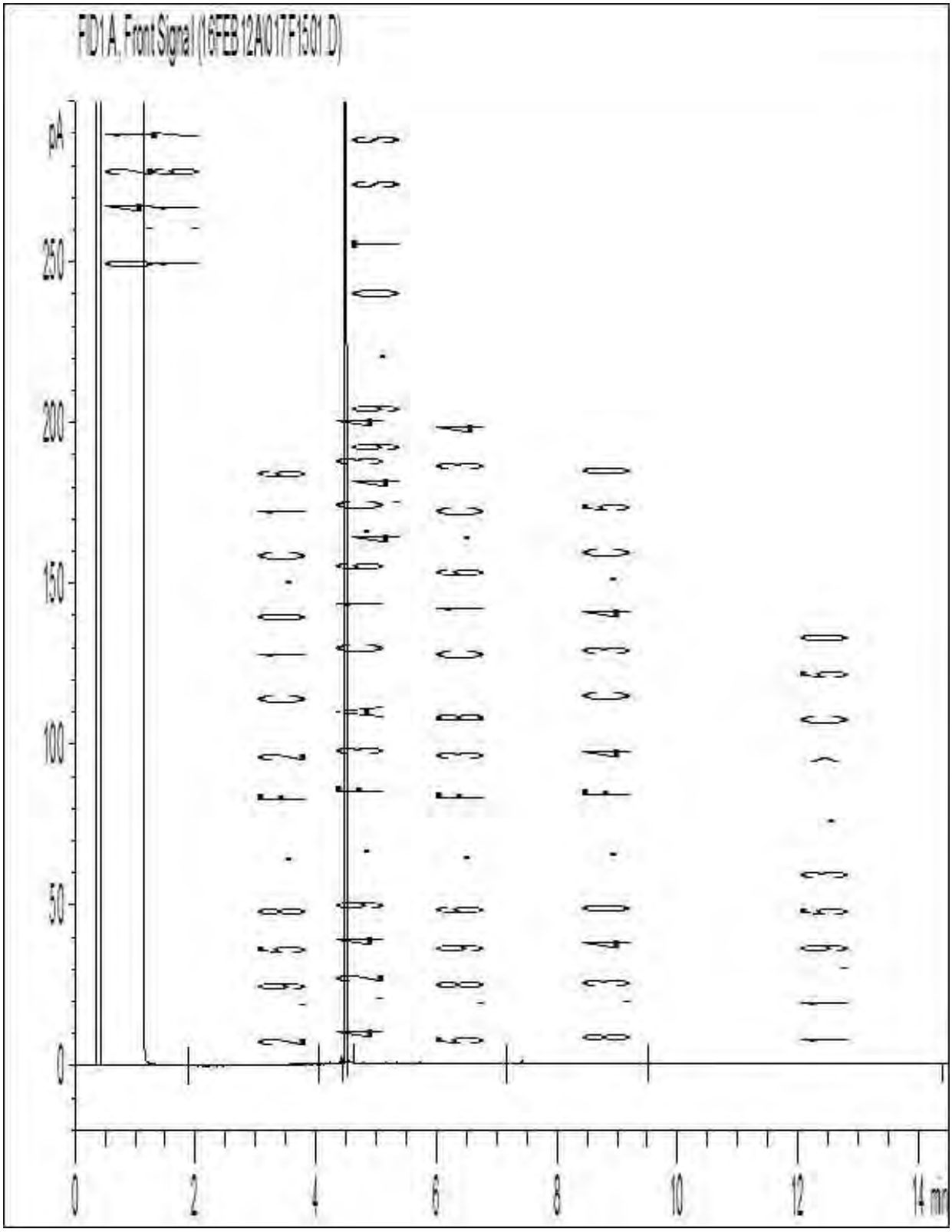


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI210

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-15-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

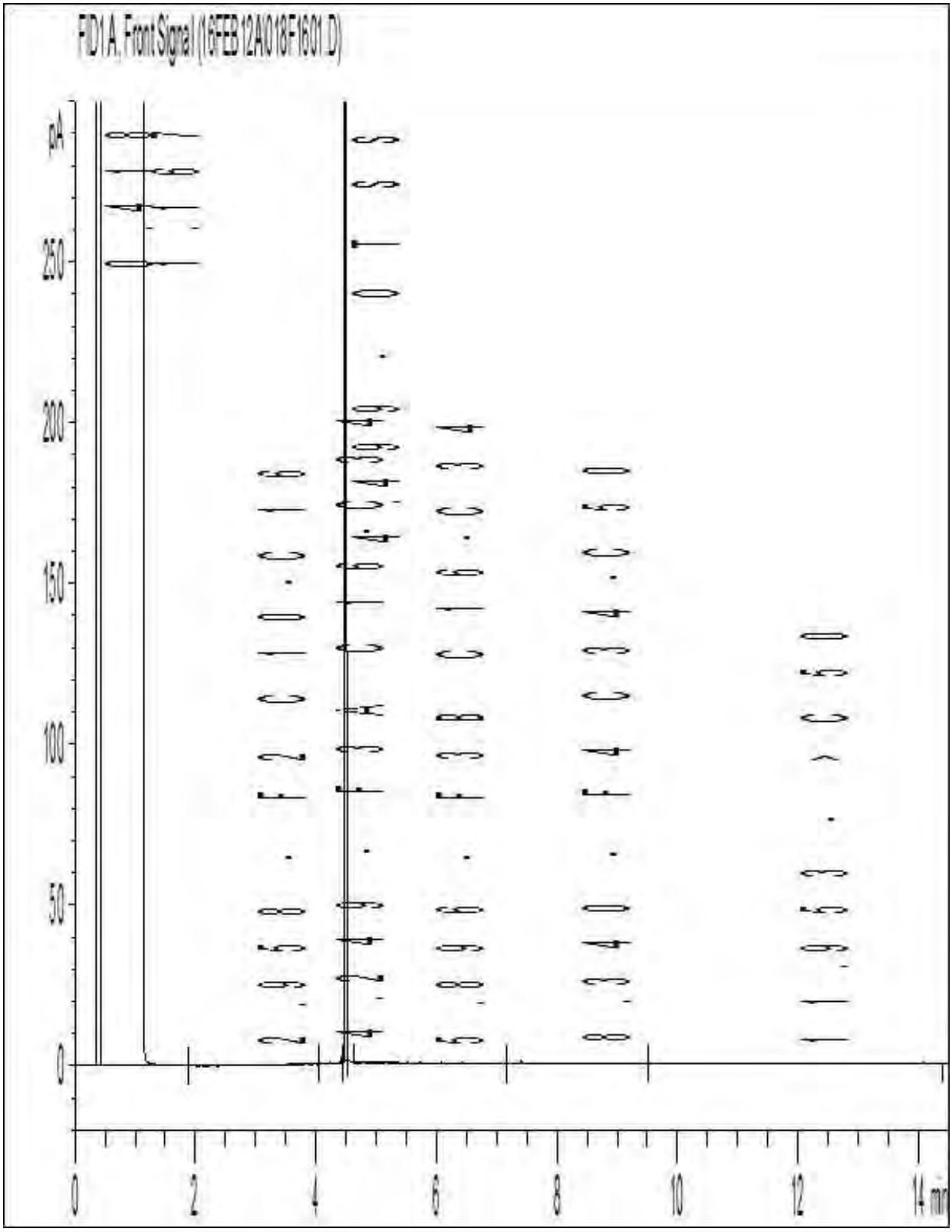


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI211

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-4-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

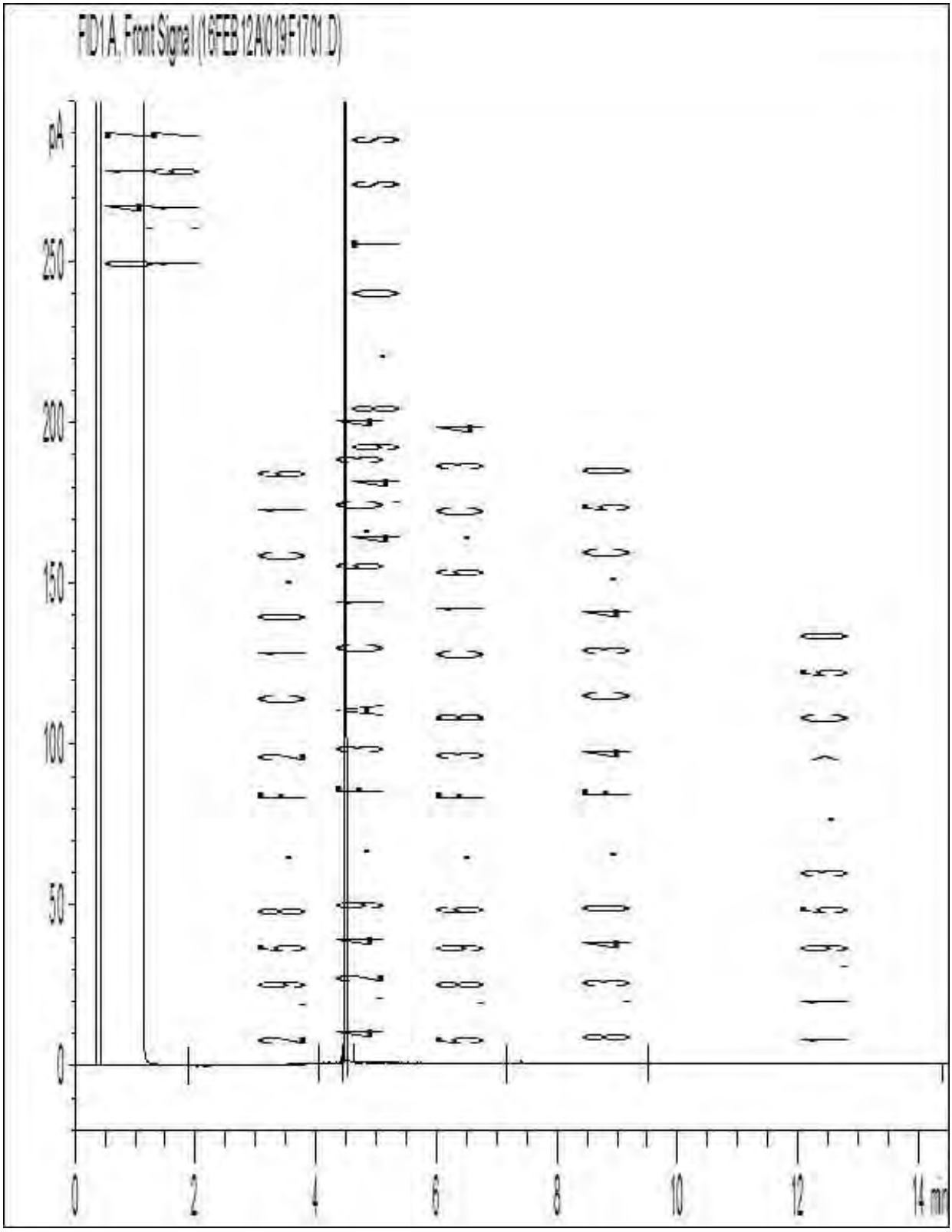


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI212

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-4-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

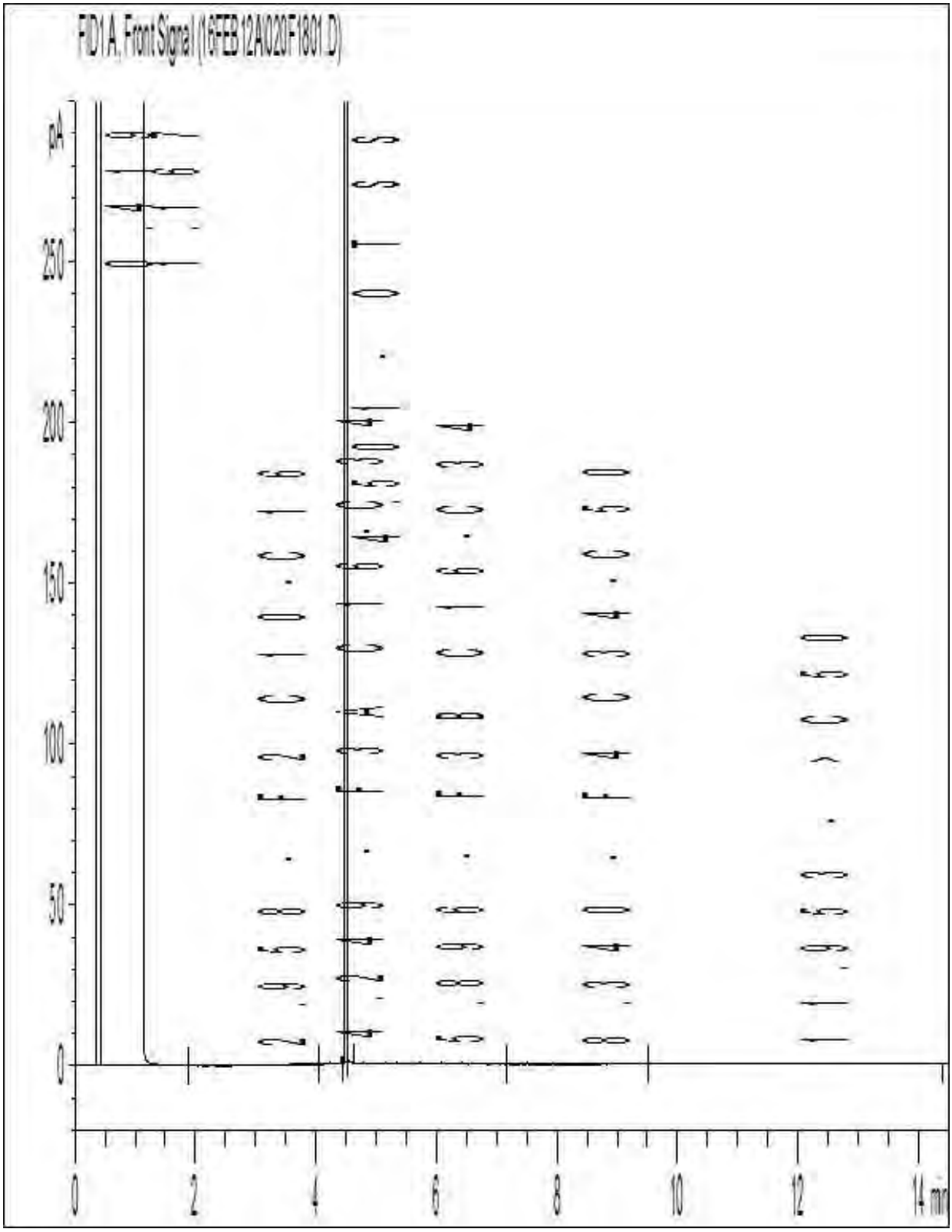


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI213

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-3-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

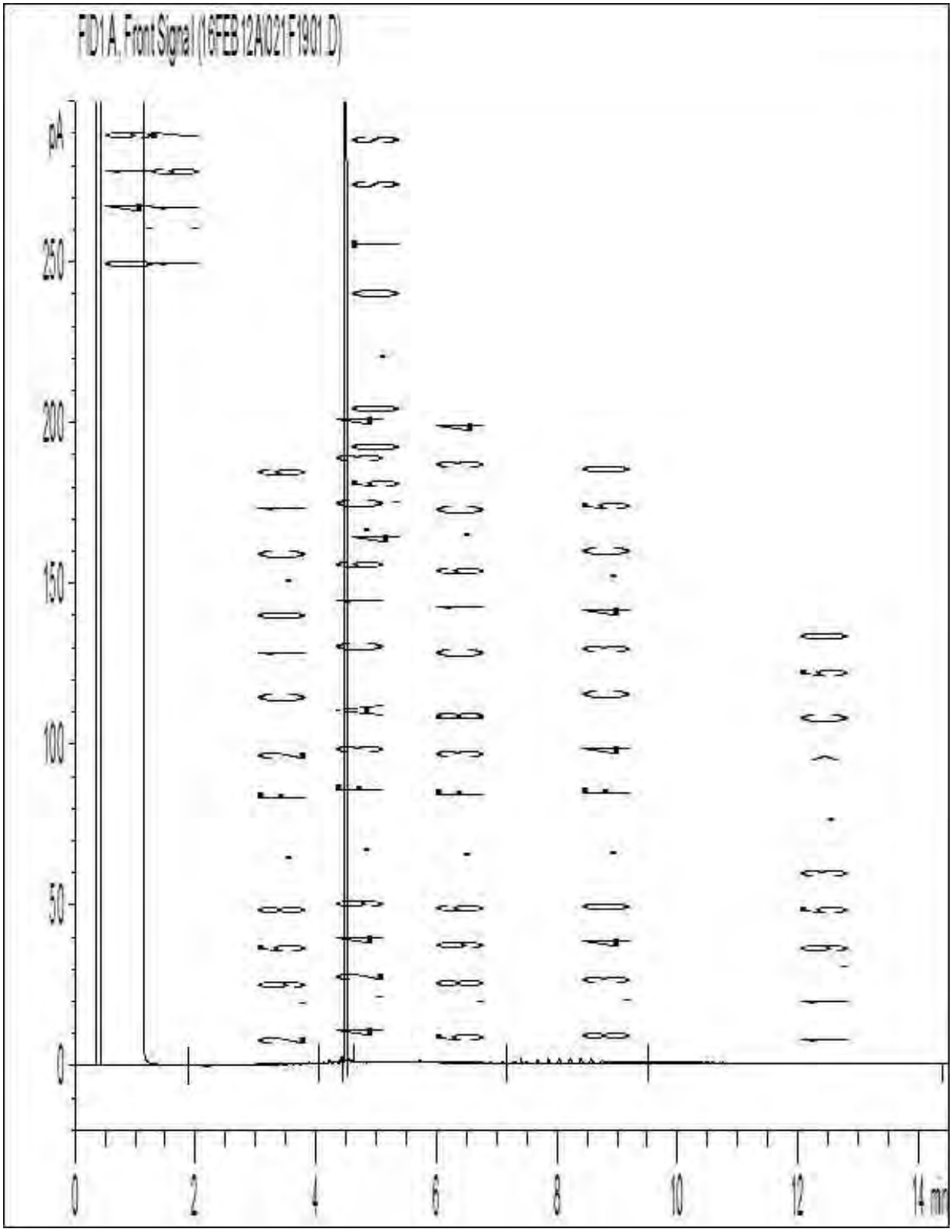


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI214

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-3-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

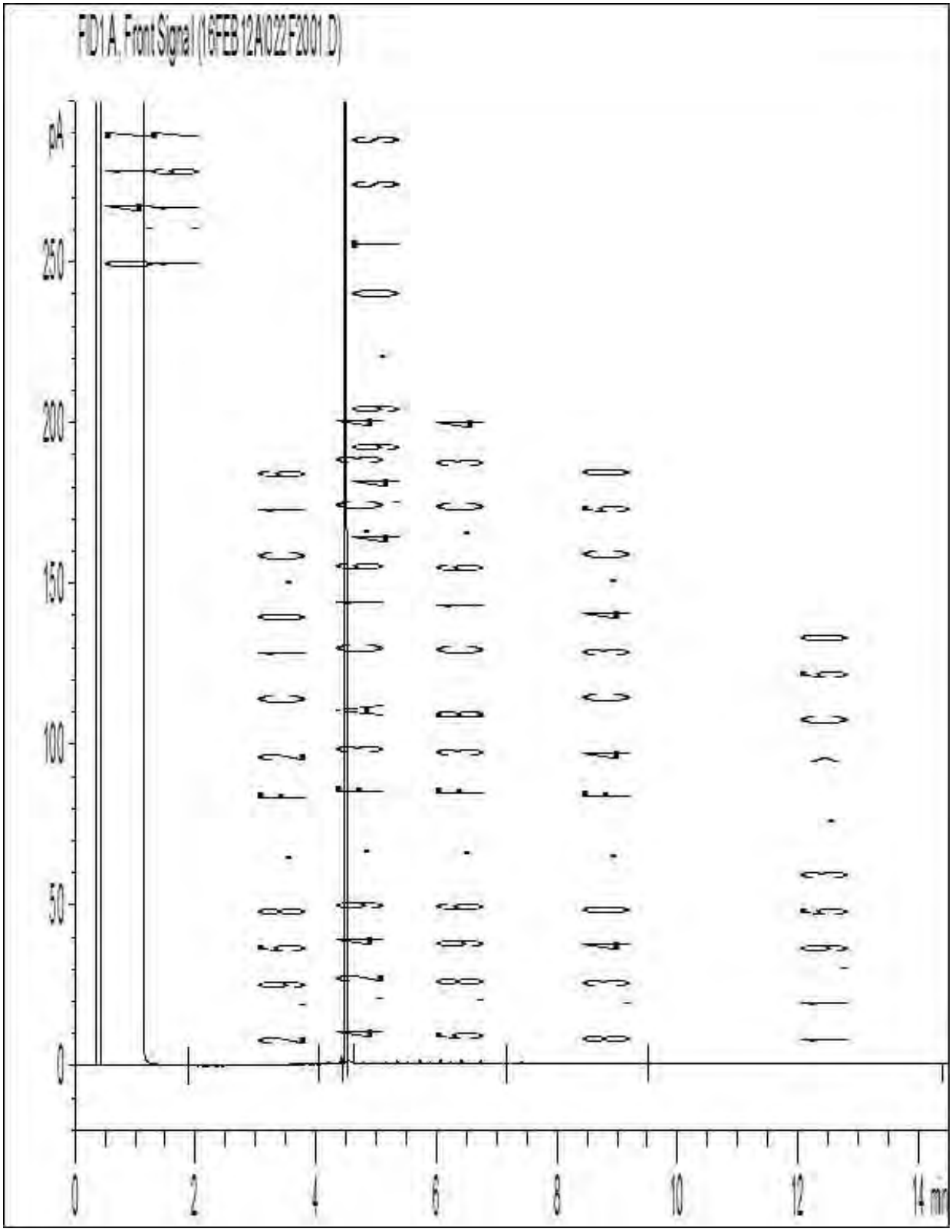


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI224

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-2-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

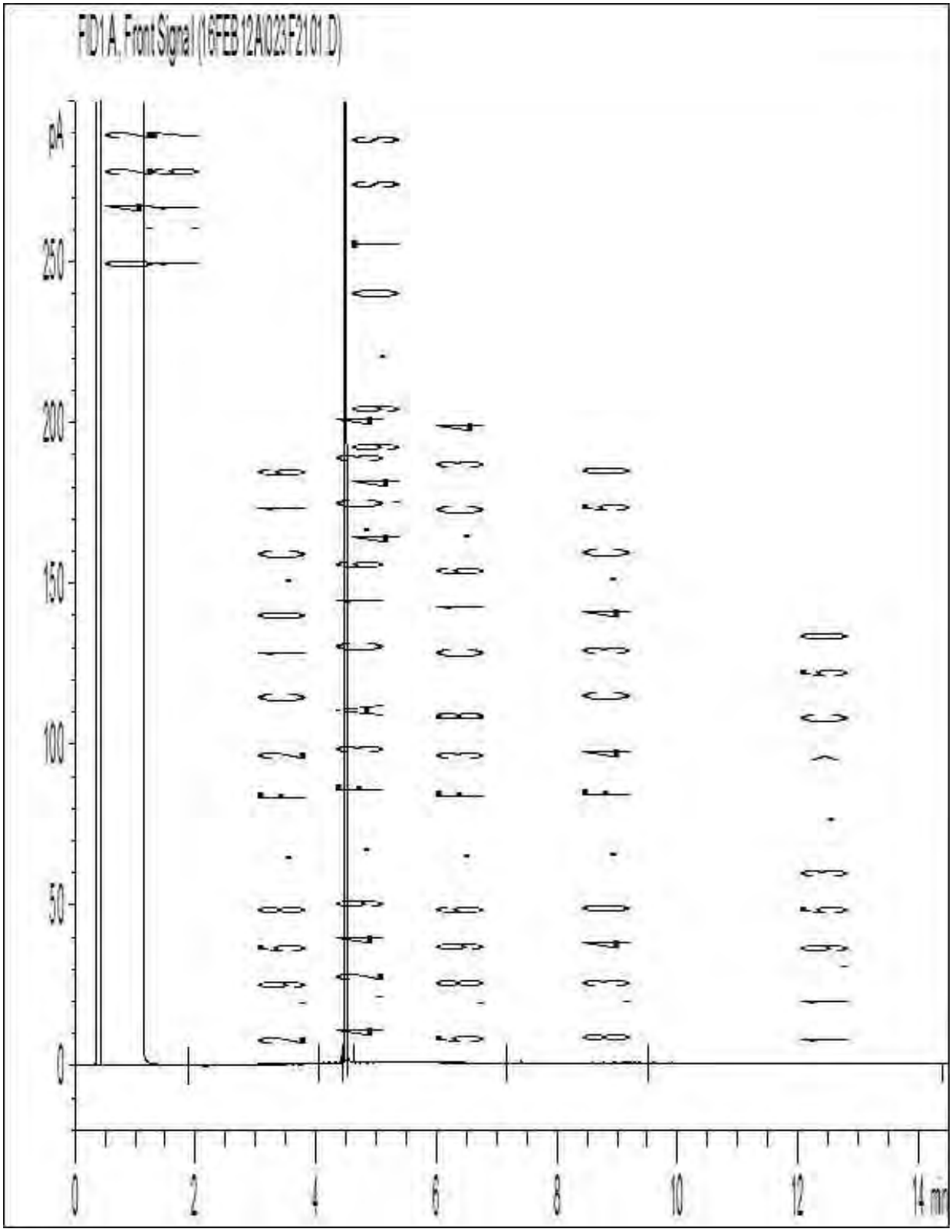


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI225

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-2-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

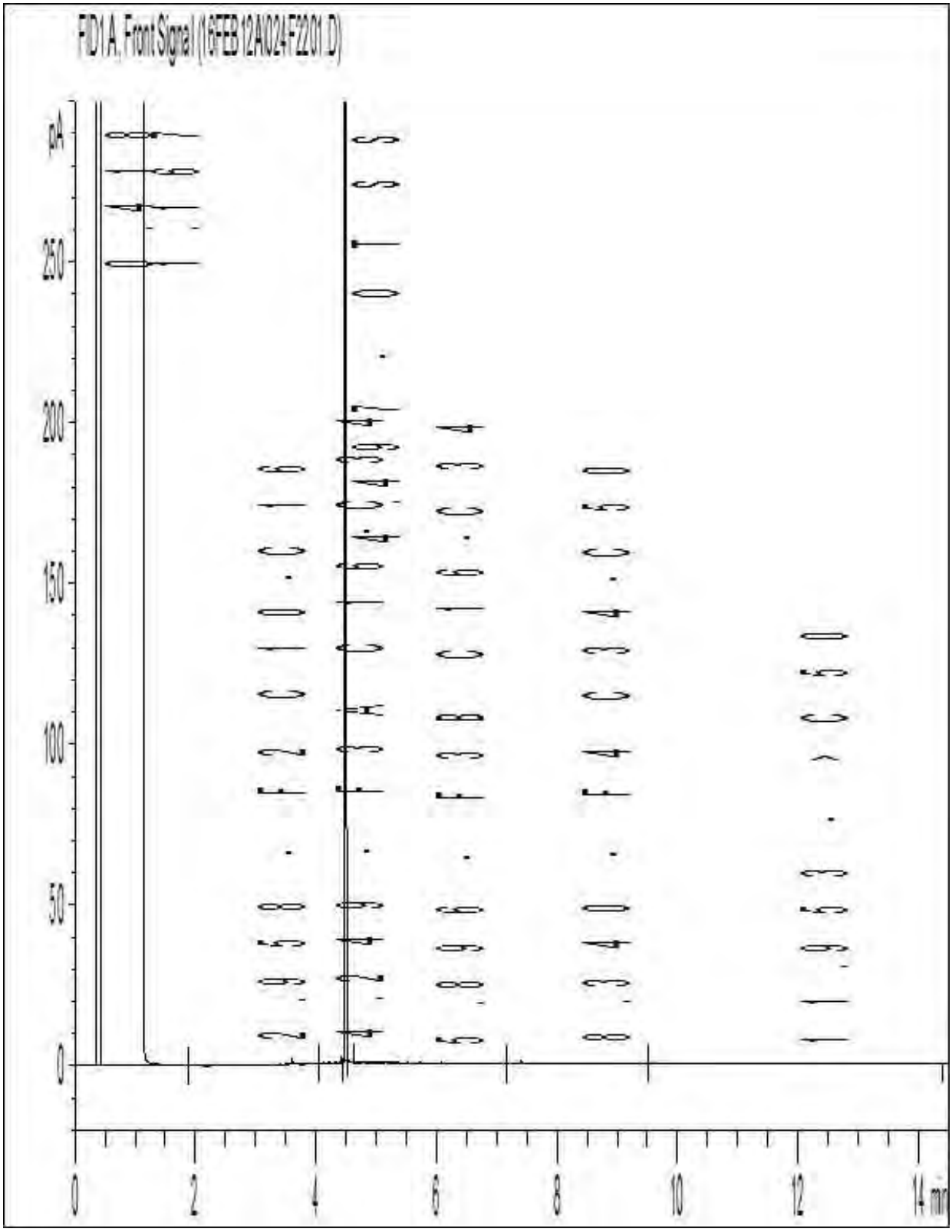


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI226

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-1-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

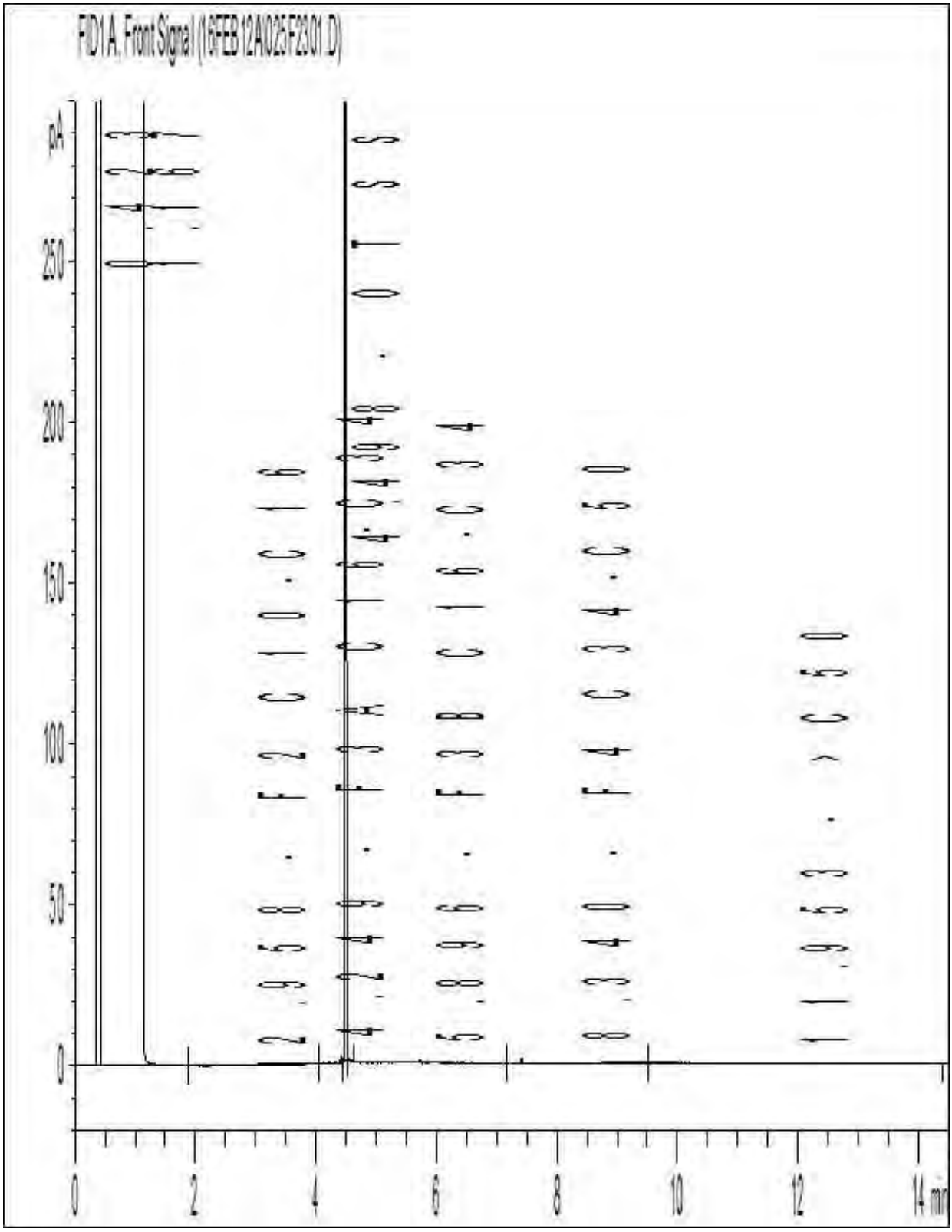


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI227

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: BH16-1-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

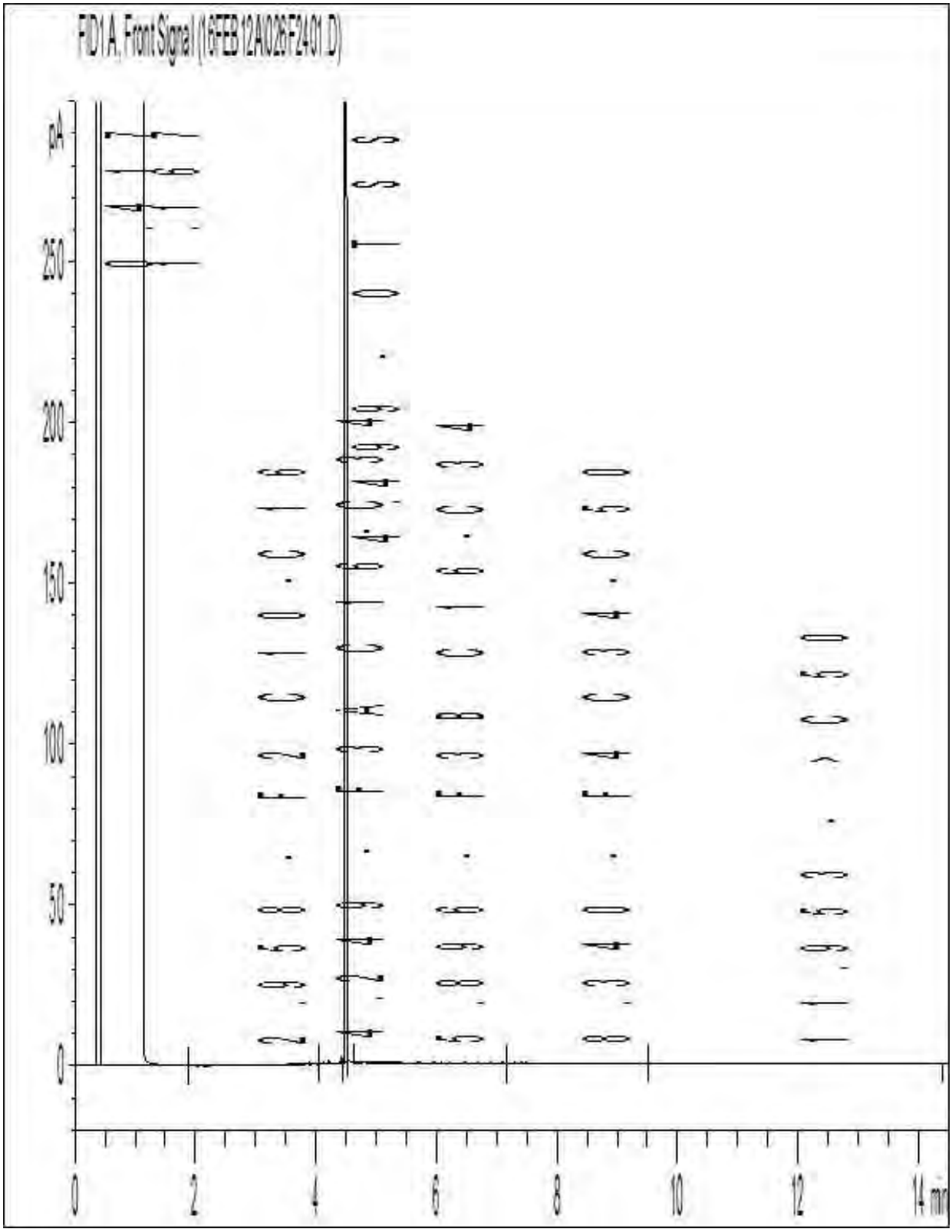


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B627697
Report Date: 2016/02/22
Maxxam Sample: BVI228

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: 1830 TRIM RD.
Client ID: DUP-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Your Project #: 450271-000
Your C.O.C. #: 548176-05-01, 548176-06-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/26
Report #: R3910039
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B633057
Received: 2016/02/18, 09:30

Sample Matrix: Soil
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	7	N/A	2016/02/24	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	13	2016/02/23	2016/02/23	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	7	N/A	2016/02/22		EPA 8260C m
Free (WAD) Cyanide (1)	13	2016/02/23	2016/02/23	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	13	2016/02/23	2016/02/24	CAM SOP-00414	OMOE E3138 v2 m
Hexavalent Chromium in Soil by IC (1, 2)	13	2016/02/22	2016/02/23	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 3)	5	N/A	2016/02/23	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 3)	2	N/A	2016/02/24	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 4)	7	2016/02/23	2016/02/24	CAM SOP-00316	CCME CWS m
Fraction Organic Carbon in Triplicate (1)	5	N/A	2016/02/24	CAM SOP-00468	Lloyd Kahn Method
Acid Extr. Metals (aqua regia) by ICPMS	13	2016/02/18	2016/02/22	OTT SOP-00003	EPA 6020
MOISTURE	7	N/A	2016/02/22	CAM SOP-00445	McKeague 2nd ed 1978
Moisture (1)	6	N/A	2016/02/23	CAM SOP-00445	Carter 2nd ed 51.2 m
OC Pesticides (Selected) & PCB (1, 5)	3	2016/02/23	2016/02/24	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters (1)	3	N/A	2016/02/22	CAM SOP-00307	EPA 8081/8082 m
PAH Compounds in Soil by GC/MS (SIM)	6	2016/02/22	2016/02/22	OTT SOP-00011	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM)	1	2016/02/22	2016/02/23	OTT SOP-00011	EPA 8270D m
pH CaCl2 EXTRACT (1)	13	2016/02/22	2016/02/22	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	13	N/A	2016/02/24	CAM SOP-00102	EPA 6010
SAR - ICP Metals (1)	13	2016/02/24	2016/02/24	CAM SOP-00408	EPA 6010 m
Total Organic Carbon in Triplicate (1)	5	N/A	2016/02/24	CAM SOP-00468	Lloyd Kahn Method
Volatile Organic Compounds in Soil (1)	7	N/A	2016/02/20	CAM SOP000228	EPA 8260C m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three

Your Project #: 450271-000
Your C.O.C. #: 548176-05-01, 548176-06-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/26
Report #: R3910039
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B633057
Received: 2016/02/18, 09:30

weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWJ264	BWJ264		BWJ265		BWJ266		
Sampling Date		2016/02/17 13:00	2016/02/17 13:00		2016/02/17 13:30		2016/02/17 13:45		
COC Number		548176-05-01	548176-05-01		548176-05-01		548176-05-01		
	UNITS	**BH16-14-1**	**BH16-14-1 Lab-Dup**	**QC Batch**	**BH16-14-2**	**QC Batch**	**BH16-12-1**	**RDL**	**QC Batch**
Calculated Parameters									
Sodium Adsorption Ratio	N/A	0.87		4385800	1.0	4385800	1.1		4385800
Inorganics									
Conductivity	mS/cm	0.43		4391460	0.26	4391460	0.60	0.002	4391460
Free Cyanide	ug/g	<0.01		4390893	<0.01	4390893	<0.01	0.01	4390893
Moisture	%			4391389	32	4391389		1.0	4391389
Available (CaCl2) pH	pH	7.19		4389819	7.56	4389819	7.41		4389819
Metals									
Soluble Calcium (Ca)	mg/L	30.4		4391456	14.3	4391456	38.1	0.5	4391456
Soluble Magnesium (Mg)	mg/L	18.9		4391456	9.5	4391456	25.8	0.5	4391456
Soluble Sodium (Na)	mg/L	25		4391456	20	4391456	37	5	4391456
Inorganics									
Chromium (VI)	ug/g	<0.2		4389888	<0.2	4389888	<0.2	0.2	4389888
Metals									
Hot Water Ext. Boron (B)	ug/g	0.067		4391086	0.12	4391123	0.088	0.050	4391086
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	4386258	<0.2	4386258	<0.2	0.2	4386258
Acid Extractable Arsenic (As)	ug/g	1	1	4386258	2	4386258	2	1	4386258
Acid Extractable Barium (Ba)	ug/g	370	360	4386258	230	4386258	260	0.5	4386258
Acid Extractable Beryllium (Be)	ug/g	0.9	1.0	4386258	0.9	4386258	0.9	0.2	4386258
Acid Extractable Boron (B)	ug/g	<5	<5	4386258	8	4386258	7	5	4386258
Acid Extractable Cadmium (Cd)	ug/g	0.1	0.1	4386258	0.1	4386258	0.1	0.1	4386258
Acid Extractable Chromium (Cr)	ug/g	140	130	4386258	160	4386258	150	1	4386258
Acid Extractable Cobalt (Co)	ug/g	27	26	4386258	28	4386258	24	0.1	4386258
Acid Extractable Copper (Cu)	ug/g	47	45	4386258	55	4386258	52	0.5	4386258
Acid Extractable Lead (Pb)	ug/g	8	8	4386258	11	4386258	10	1	4386258
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	4386258	<0.05	4386258	<0.05	0.05	4386258
Acid Extractable Molybdenum (Mo)	ug/g	<0.5	<0.5	4386258	0.6	4386258	0.5	0.5	4386258
Acid Extractable Nickel (Ni)	ug/g	78	77	4386258	87	4386258	80	0.5	4386258
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	4386258	<0.5	4386258	<0.5	0.5	4386258
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	4386258	<0.2	4386258	<0.2	0.2	4386258
Acid Extractable Thallium (Tl)	ug/g	0.47	0.48	4386258	0.39	4386258	0.41	0.05	4386258
Acid Extractable Uranium (U)	ug/g	1.1	1.1	4386258	1.2	4386258	1.5	0.05	4386258
Acid Extractable Vanadium (V)	ug/g	120	110	4386258	100	4386258	100	5	4386258
Acid Extractable Zinc (Zn)	ug/g	130	120	4386258	120	4386258	110	5	4386258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWJ267		BWJ267		BWJ268		BWJ269		
Sampling Date		2016/02/17 13:55		2016/02/17 13:55		2016/02/17 14:00		2016/02/17 14:15		
COC Number		548176-05-01		548176-05-01		548176-05-01		548176-05-01		
	UNITS	**BH16-12-2**	**RDL**	**BH16-12-2 Lab-Dup**	**QC Batch**	**BH16-9-1**	**QC Batch**	**BH16-9-2**	**RDL**	**QC Batch**
Calculated Parameters										
Sodium Adsorption Ratio	N/A	1.0			4385800	0.55	4385800	0.67		4385800
Inorganics										
Conductivity	mS/cm	0.78	0.002		4391460	2.6	4391460	0.84	0.002	4391460
Free Cyanide	ug/g	<0.01	0.01		4390893	<0.01	4390893	<0.01	0.01	4390893
Moisture	%	34	1.0		4391389		4391389	33	1.0	4391389
Available (CaCl2) pH	pH	7.40		7.52	4389819	7.69	4389819	7.47		4389819
Metals										
Soluble Calcium (Ca)	mg/L	52.9	0.5		4391456	575	4391456	67.5	0.5	4391456
Soluble Magnesium (Mg)	mg/L	35.5	0.5		4391456	44.6	4391456	43.7	0.5	4391456
Soluble Sodium (Na)	mg/L	39	5		4391456	51	4391456	29	5	4391456
Inorganics										
Chromium (VI)	ug/g	<0.2	0.2		4389888	<0.2	4389888	<0.2	0.2	4389888
Metals										
Hot Water Ext. Boron (B)	ug/g	0.12	0.050		4391086	0.67	4391123	0.14	0.050	4391086
Acid Extractable Antimony (Sb)	ug/g	<0.2	0.2		4386258	<0.2	4386258	<0.2	0.2	4386258
Acid Extractable Arsenic (As)	ug/g	1	1		4386258	4	4386258	1	1	4386258
Acid Extractable Barium (Ba)	ug/g	330	0.5		4386258	360	4386258	340	0.5	4386258
Acid Extractable Beryllium (Be)	ug/g	0.9	0.2		4386258	0.6	4386258	0.9	0.2	4386258
Acid Extractable Boron (B)	ug/g	6	5		4386258	6	4386258	<5	5	4386258
Acid Extractable Cadmium (Cd)	ug/g	0.1	0.1		4386258	<0.1	4386258	0.1	0.1	4386258
Acid Extractable Chromium (Cr)	ug/g	140	1		4386258	10	4386258	140	1	4386258
Acid Extractable Cobalt (Co)	ug/g	26	0.1		4386258	5.6	4386258	24	0.1	4386258
Acid Extractable Copper (Cu)	ug/g	52	0.5		4386258	5.4	4386258	50	0.5	4386258
Acid Extractable Lead (Pb)	ug/g	9	1		4386258	11	4386258	8	1	4386258
Acid Extractable Mercury (Hg)	ug/g	<0.05	0.05		4386258	<0.05	4386258	<0.05	0.05	4386258
Acid Extractable Molybdenum (Mo)	ug/g	<0.5	0.5		4386258	0.7	4386258	<0.5	0.5	4386258
Acid Extractable Nickel (Ni)	ug/g	75	0.5		4386258	12	4386258	72	0.5	4386258
Acid Extractable Selenium (Se)	ug/g	<0.5	0.5		4386258	<0.5	4386258	<0.5	0.5	4386258
Acid Extractable Silver (Ag)	ug/g	<0.2	0.2		4386258	<0.2	4386258	<0.2	0.2	4386258
Acid Extractable Thallium (Tl)	ug/g	0.49	0.05		4386258	0.29	4386258	0.49	0.05	4386258
Acid Extractable Uranium (U)	ug/g	1.1	0.05		4386258	0.63	4386258	1.1	0.05	4386258
Acid Extractable Vanadium (V)	ug/g	120	5		4386258	8	4386258	120	5	4386258
Acid Extractable Zinc (Zn)	ug/g	120	5		4386258	14	4386258	130	5	4386258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWJ270	BWJ271	BWJ272	BWJ272	BWJ273		
Sampling Date		2016/02/17 14:25	2016/02/17 14:35	2016/02/17 14:50	2016/02/17 14:50	2016/02/17 15:15		
COC Number		548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01		
	UNITS	**BH16-7-1**	**BH16-7-2**	**BH16-6-1**	**BH16-6-1 Lab-Dup**	**BH16-6-2**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A	0.62	0.82	2.0		0.85		4385800
Inorganics								
Conductivity	mS/cm	0.28	0.41	0.25	0.25	0.93	0.002	4391460
Free Cyanide	ug/g	<0.01	<0.01	<0.01		<0.01	0.01	4390893
Moisture	%		35			38	1.0	4391389
Available (CaCl2) pH	pH	7.54	7.63	7.79		7.69		4389819
Metals								
Soluble Calcium (Ca)	mg/L	24.8	24.1	11.3	11.2	72.1	0.5	4391456
Soluble Magnesium (Mg)	mg/L	7.0	20.3	3.1	3.2	48.0	0.5	4391456
Soluble Sodium (Na)	mg/L	14	22	29	30	38	5	4391456
Inorganics								
Chromium (VI)	ug/g	<0.2	<0.2	<0.2		<0.2	0.2	4389888
Metals								
Hot Water Ext. Boron (B)	ug/g	0.27	0.18	0.42		0.17	0.050	4391086
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2		<0.2	0.2	4386258
Acid Extractable Arsenic (As)	ug/g	3	1	3		1	1	4386258
Acid Extractable Barium (Ba)	ug/g	110	220	460		280	0.5	4386258
Acid Extractable Beryllium (Be)	ug/g	0.2	0.7	0.6		0.9	0.2	4386258
Acid Extractable Boron (B)	ug/g	6	6	7		9	5	4386258
Acid Extractable Cadmium (Cd)	ug/g	0.2	0.1	<0.1		0.1	0.1	4386258
Acid Extractable Chromium (Cr)	ug/g	7	130	11		120	1	4386258
Acid Extractable Cobalt (Co)	ug/g	2.6	22	6.6		23	0.1	4386258
Acid Extractable Copper (Cu)	ug/g	16	51	5.9		56	0.5	4386258
Acid Extractable Lead (Pb)	ug/g	12	9	12		10	1	4386258
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05		<0.05	0.05	4386258
Acid Extractable Molybdenum (Mo)	ug/g	0.7	0.5	<0.5		<0.5	0.5	4386258
Acid Extractable Nickel (Ni)	ug/g	5.7	73	14		69	0.5	4386258
Acid Extractable Selenium (Se)	ug/g	0.5	<0.5	<0.5		<0.5	0.5	4386258
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2		<0.2	0.2	4386258
Acid Extractable Thallium (Tl)	ug/g	0.12	0.35	0.27		0.42	0.05	4386258
Acid Extractable Uranium (U)	ug/g	0.53	1.2	0.55		1.2	0.05	4386258
Acid Extractable Vanadium (V)	ug/g	7	99	9		110	5	4386258
Acid Extractable Zinc (Zn)	ug/g	39	100	16		120	5	4386258

RDL = Reportable Detection Limit
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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWJ304			BWJ305	BWJ306		
Sampling Date		2016/02/17 15:30			2016/02/17 15:45	2016/02/17 13:00		
COC Number		548176-06-01			548176-06-01	548176-06-01		
	UNITS	**BH16-8-1**	**RDL**	**QC Batch**	**BH16-8-2**	**DUP-2**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A	1.4		4385800	1.6	1.1		4385800
Inorganics								
Conductivity	mS/cm	0.29	0.002	4391460	0.80	0.29	0.002	4391460
Free Cyanide	ug/g	0.04	0.04	4390893	<0.01	<0.01	0.01	4390893
Moisture	%			4391389	31		1.0	4391389
Available (CaCl2) pH	pH	6.70		4389819	7.18	7.03		4389819
Metals								
Soluble Calcium (Ca)	mg/L	21.1	0.5	4391456	45.5	15.8	0.5	4391456
Soluble Magnesium (Mg)	mg/L	6.4	0.5	4391456	31.4	10.9	0.5	4391456
Soluble Sodium (Na)	mg/L	29	5	4391456	56	23	5	4391456
Inorganics								
Chromium (VI)	ug/g	<0.2	0.2	4389888	<0.2	<0.2	0.2	4389888
Metals								
Hot Water Ext. Boron (B)	ug/g	0.26	0.050	4391086	0.11	0.052	0.050	4391123
Acid Extractable Antimony (Sb)	ug/g	<0.2	0.2	4386258	<0.2	<0.2	0.2	4386258
Acid Extractable Arsenic (As)	ug/g	2	1	4386258	1	2	1	4386258
Acid Extractable Barium (Ba)	ug/g	140	0.5	4386258	310	360	0.5	4386258
Acid Extractable Beryllium (Be)	ug/g	0.8	0.2	4386258	0.9	1.3	0.2	4386258
Acid Extractable Boron (B)	ug/g	<5	5	4386258	<5	<5	5	4386258
Acid Extractable Cadmium (Cd)	ug/g	0.3	0.1	4386258	0.1	0.2	0.1	4386258
Acid Extractable Chromium (Cr)	ug/g	74	1	4386258	110	140	1	4386258
Acid Extractable Cobalt (Co)	ug/g	13	0.1	4386258	23	31	0.1	4386258
Acid Extractable Copper (Cu)	ug/g	21	0.5	4386258	44	54	0.5	4386258
Acid Extractable Lead (Pb)	ug/g	23	1	4386258	8	10	1	4386258
Acid Extractable Mercury (Hg)	ug/g	<0.05	0.05	4386258	<0.05	<0.05	0.05	4386258
Acid Extractable Molybdenum (Mo)	ug/g	0.7	0.5	4386258	<0.5	<0.5	0.5	4386258
Acid Extractable Nickel (Ni)	ug/g	36	0.5	4386258	64	80	0.5	4386258
Acid Extractable Selenium (Se)	ug/g	0.5	0.5	4386258	<0.5	<0.5	0.5	4386258
Acid Extractable Silver (Ag)	ug/g	<0.2	0.2	4386258	<0.2	<0.2	0.2	4386258
Acid Extractable Thallium (Tl)	ug/g	0.25	0.05	4386258	0.46	0.46	0.05	4386258
Acid Extractable Uranium (U)	ug/g	1.6	0.05	4386258	0.98	1.7	0.05	4386258
Acid Extractable Vanadium (V)	ug/g	64	5	4386258	100	120	5	4386258
Acid Extractable Zinc (Zn)	ug/g	96	5	4386258	120	130	5	4386258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		BWJ266	BWJ270		BWJ304		
Sampling Date		2016/02/17 13:45	2016/02/17 14:25		2016/02/17 15:30		
COC Number		548176-05-01	548176-05-01		548176-06-01		
	UNITS	**BH16-12-1**	**BH16-7-1**	**RDL**	**BH16-8-1**	**RDL**	**QC Batch**
Calculated Parameters							
Chlordane (Total)	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4386008
o,p-DDD + p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4386008
o,p-DDE + p,p-DDE	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4386008
o,p-DDT + p,p-DDT	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4386008
Total Endosulfan	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4386008
Total PCB	ug/g	<0.015	<0.015	0.015	<0.030	0.030	4386008
Pesticides & Herbicides							
Aldrin	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
a-Chlordane	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
g-Chlordane	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
o,p-DDD	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
o,p-DDE	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
p,p-DDE	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
o,p-DDT	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
p,p-DDT	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Dieldrin	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Lindane	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Endosulfan I (alpha)	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Endosulfan II (beta)	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Endrin	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Heptachlor	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Heptachlor epoxide	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Hexachlorobenzene	ug/g	<0.0020	<0.0020	0.0020	<0.0040	0.0040	4390994
Hexachlorobutadiene	ug/g	<0.0050	<0.0050	0.0050	<0.010	0.010	4390994
Hexachloroethane	ug/g	<0.0050	<0.0050	0.0050	<0.010	0.010	4390994
Methoxychlor	ug/g	<0.0050	<0.0050	0.0050	<0.010	0.010	4390994
Aroclor 1242	ug/g	<0.015	<0.015	0.015	<0.030	0.030	4390994
Aroclor 1248	ug/g	<0.015	<0.015	0.015	<0.030	0.030	4390994
Aroclor 1254	ug/g	<0.015	<0.015	0.015	<0.030	0.030	4390994
Aroclor 1260	ug/g	<0.015	<0.015	0.015	<0.030	0.030	4390994
Surrogate Recovery (%)							
2,4,5,6-Tetrachloro-m-xylene	%	77	92		89		4390994
Decachlorobiphenyl	%	94	106		101		4390994

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 PAHS (SOIL)

Maxxam ID		BWJ264	BWJ264	BWJ266	BWJ268	BWJ270	BWJ272		
Sampling Date		2016/02/17 13:00	2016/02/17 13:00	2016/02/17 13:45	2016/02/17 14:00	2016/02/17 14:25	2016/02/17 14:50		
COC Number		548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01		
	UNITS	**BH16-14-1**	**BH16-14-1 Lab-Dup**	**BH16-12-1**	**BH16-9-1**	**BH16-7-1**	**BH16-6-1**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	25		28	9.0	4.7	6.7	0.2	4388264
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.014		<0.014	<0.014	<0.014	<0.014	0.014	4386009
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4389620
Surrogate Recovery (%)									
D10-Anthracene	%	80	81	75	76	78	75		4389620
D14-Terphenyl (FS)	%	77	77	72	72	76	72		4389620
D8-Acenaphthylene	%	69	67	64	68	69	67		4389620

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 PAHS (SOIL)

Maxxam ID		BWJ304	BWJ306		
Sampling Date		2016/02/17 15:30	2016/02/17 13:00		
COC Number		548176-06-01	548176-06-01		
	UNITS	**BH16-8-1**	**DUP-2**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	38	28	0.2	4388264
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/g	<0.014	<0.014	0.014	4386009
Polyaromatic Hydrocarbons					
Acenaphthene	ug/g	<0.0050	<0.0050	0.0050	4389620
Acenaphthylene	ug/g	<0.0050	<0.0050	0.0050	4389620
Anthracene	ug/g	<0.0050	<0.0050	0.0050	4389620
Benzo(a)anthracene	ug/g	0.053	<0.0050	0.0050	4389620
Benzo(a)pyrene	ug/g	0.057	<0.0050	0.0050	4389620
Benzo(b/j)fluoranthene	ug/g	0.085	<0.0050	0.0050	4389620
Benzo(g,h,i)perylene	ug/g	0.035	<0.0050	0.0050	4389620
Benzo(k)fluoranthene	ug/g	0.024	<0.0050	0.0050	4389620
Chrysene	ug/g	0.057	<0.0050	0.0050	4389620
Dibenz(a,h)anthracene	ug/g	0.0086	<0.0050	0.0050	4389620
Fluoranthene	ug/g	0.11	<0.0050	0.0050	4389620
Fluorene	ug/g	<0.0050	<0.0050	0.0050	4389620
Indeno(1,2,3-cd)pyrene	ug/g	0.035	<0.0050	0.0050	4389620
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	4389620
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	4389620
Naphthalene	ug/g	<0.0050	<0.0050	0.0050	4389620
Phenanthrene	ug/g	0.021	<0.0050	0.0050	4389620
Pyrene	ug/g	0.089	<0.0050	0.0050	4389620
Surrogate Recovery (%)					
D10-Anthracene	%	76	77		4389620
D14-Terphenyl (FS)	%	74	79		4389620
D8-Acenaphthylene	%	69	71		4389620

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BWJ264	BWJ266	BWJ268	BWJ270	BWJ272		
Sampling Date		2016/02/17 13:00	2016/02/17 13:45	2016/02/17 14:00	2016/02/17 14:25	2016/02/17 14:50		
COC Number		548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01		
	UNITS	**BH16-14-1**	**BH16-12-1**	**BH16-9-1**	**BH16-7-1**	**BH16-6-1**	**RDL**	**QC Batch**
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4387772
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4387772
Bromodichloromethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Bromoform	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Bromomethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Carbon Tetrachloride	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Chlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Chloroform	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Dibromochloromethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,1-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,2-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,1-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,2-Dichloropropane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4387772
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4387772
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4387772
Ethylene Dibromide	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Hexane	ug/g	<0.050	<0.050	0.13	0.063	0.054	0.050	4387772
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4387772
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4387772
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Styrene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Tetrachloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Toluene	ug/g	<0.020	<0.020	0.041	<0.020	<0.020	0.020	4387772
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BWJ264	BWJ266	BWJ268	BWJ270	BWJ272		
Sampling Date		2016/02/17 13:00	2016/02/17 13:45	2016/02/17 14:00	2016/02/17 14:25	2016/02/17 14:50		
COC Number		548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01		
	UNITS	**BH16-14-1**	**BH16-12-1**	**BH16-9-1**	**BH16-7-1**	**BH16-6-1**	**RDL**	**QC Batch**
Trichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4387772
Vinyl Chloride	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4387772
p+m-Xylene	ug/g	<0.020	<0.020	0.057	<0.020	<0.020	0.020	4387772
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4387772
Total Xylenes	ug/g	<0.020	<0.020	0.057	<0.020	<0.020	0.020	4387772
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	4390690
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	4390690
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	4391555
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	4391555
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	4391555
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes		4391555
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	108	107	106	105	109		4390690
4-Bromofluorobenzene	%	105	103	102	102	101		4390690
D10-Ethylbenzene	%	104	113	95	79	112		4390690
D4-1,2-Dichloroethane	%	105	104	104	103	108		4390690
o-Terphenyl	%	100	94	95	96	95		4391555
4-Bromofluorobenzene	%	96	95	94	95	95		4387772
D10-o-Xylene	%	87	88	84	79	84		4387772
D4-1,2-Dichloroethane	%	94	94	95	94	95		4387772
D8-Toluene	%	101	102	102	101	102		4387772

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BWJ304	BWJ306		
Sampling Date		2016/02/17 15:30	2016/02/17 13:00		
COC Number		548176-06-01	548176-06-01		
	UNITS	**BH16-8-1**	**DUP-2**	**RDL**	**QC Batch**
Volatile Organics					
Acetone (2-Propanone)	ug/g	<0.50	<0.50	0.50	4387772
Benzene	ug/g	<0.020	<0.020	0.020	4387772
Bromodichloromethane	ug/g	<0.050	<0.050	0.050	4387772
Bromoform	ug/g	<0.050	<0.050	0.050	4387772
Bromomethane	ug/g	<0.050	<0.050	0.050	4387772
Carbon Tetrachloride	ug/g	<0.050	<0.050	0.050	4387772
Chlorobenzene	ug/g	<0.050	<0.050	0.050	4387772
Chloroform	ug/g	<0.050	<0.050	0.050	4387772
Dibromochloromethane	ug/g	<0.050	<0.050	0.050	4387772
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4387772
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4387772
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4387772
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	0.050	4387772
1,1-Dichloroethane	ug/g	<0.050	<0.050	0.050	4387772
1,2-Dichloroethane	ug/g	<0.050	<0.050	0.050	4387772
1,1-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4387772
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4387772
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4387772
1,2-Dichloropropane	ug/g	<0.050	<0.050	0.050	4387772
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	0.030	4387772
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	0.040	4387772
Ethylbenzene	ug/g	<0.020	<0.020	0.020	4387772
Ethylene Dibromide	ug/g	<0.050	<0.050	0.050	4387772
Hexane	ug/g	<0.050	<0.050	0.050	4387772
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	0.050	4387772
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	0.50	4387772
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	0.50	4387772
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	0.050	4387772
Styrene	ug/g	<0.050	<0.050	0.050	4387772
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	4387772
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	4387772
Tetrachloroethylene	ug/g	<0.050	<0.050	0.050	4387772
Toluene	ug/g	<0.020	<0.020	0.020	4387772
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	0.050	4387772
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	0.050	4387772

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BWJ304	BWJ306		
Sampling Date		2016/02/17 15:30	2016/02/17 13:00		
COC Number		548176-06-01	548176-06-01		
	UNITS	**BH16-8-1**	**DUP-2**	**RDL**	**QC Batch**
Trichloroethylene	ug/g	<0.050	<0.050	0.050	4387772
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	0.050	4387772
Vinyl Chloride	ug/g	<0.020	<0.020	0.020	4387772
p+m-Xylene	ug/g	<0.020	<0.020	0.020	4387772
o-Xylene	ug/g	<0.020	<0.020	0.020	4387772
Total Xylenes	ug/g	<0.020	<0.020	0.020	4387772
BTEX & F1 Hydrocarbons					
F1 (C6-C10)	ug/g	<10	<10	10	4390690
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	4390690
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	10	4391555
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	50	4391555
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	50	4391555
Reached Baseline at C50	ug/g	Yes	Yes		4391555
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	106	105		4390690
4-Bromofluorobenzene	%	105	101		4390690
D10-Ethylbenzene	%	68	88		4390690
D4-1,2-Dichloroethane	%	106	104		4390690
o-Terphenyl	%	95	94		4391555
4-Bromofluorobenzene	%	95	95		4387772
D10-o-Xylene	%	84	91		4387772
D4-1,2-Dichloroethane	%	97	94		4387772
D8-Toluene	%	101	102		4387772

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

RESULTS OF ANALYSES OF SOIL

Maxxam ID		BWJ264	BWJ266	BWJ268	BWJ270	BWJ272		
Sampling Date		2016/02/17 13:00	2016/02/17 13:45	2016/02/17 14:00	2016/02/17 14:25	2016/02/17 14:50		
COC Number		548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01		
	UNITS	**BH16-14-1**	**BH16-12-1**	**BH16-9-1**	**BH16-7-1**	**BH16-6-1**	**RDL**	**QC Batch**
Calculated Parameters								
Fraction of Organic Carbon	g/g	0.0005	0.0006	0.011	0.0062	0.0082	0.0005	4386007
Fraction of Organic Carbon (rep.#1)	g/g	0.0005	0.0007	0.010	0.0075	0.0099	0.0005	4386007
Fraction of Organic Carbon (rep.#2)	g/g	0.0005	0.0008	0.014	0.0082	0.011	0.0005	4386007
Average FOC Result	g/g	0.0005	0.0007	0.012	0.0073	0.0098	0.0005	4386007
Inorganics								
Total Organic Carbon	mg/kg	540	620	11000	6200	8200	500	4392277
Total Organic Carbon (repeat #1)	mg/kg	510	700	10000	7500	9900	500	4392277
Total Organic Carbon (repeat #2)	mg/kg	520	780	14000	8200	11000	500	4392277

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID		BWJ264	BWJ266	BWJ268	BWJ270	BWJ272	BWJ304		
Sampling Date		2016/02/17 13:00	2016/02/17 13:45	2016/02/17 14:00	2016/02/17 14:25	2016/02/17 14:50	2016/02/17 15:30		
COC Number		548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-05-01	548176-06-01		
	UNITS	**BH16-14-1**	**BH16-12-1**	**BH16-9-1**	**BH16-7-1**	**BH16-6-1**	**BH16-8-1**	**RDL**	**QC Batch**
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4385820

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BWJ306		
Sampling Date		2016/02/17 13:00		
COC Number		548176-06-01		
	UNITS	**DUP-2**	**RDL**	**QC Batch**
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	4385820

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWJ264
Sample ID: BH16-14-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/23	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4386007	N/A	2016/02/24	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Total Organic Carbon in Triplicate	COMB	4392277	N/A	2016/02/24	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWJ264 Dup
Sample ID: BH16-14-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici

Maxxam ID: BWJ265
Sample ID: BH16-14-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4391123	2016/02/23	2016/02/23	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
Moisture	BAL	4391389	N/A	2016/02/23	Chun Yan
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

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Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
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TEST SUMMARY

Maxxam ID: BWJ266
Sample ID: BH16-12-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4386007	N/A	2016/02/24	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
OC Pesticides (Selected) & PCB	GC/ECD	4390994	2016/02/23	2016/02/24	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4386008	N/A	2016/02/22	Automated Statchk
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Total Organic Carbon in Triplicate	COMB	4392277	N/A	2016/02/24	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWJ267
Sample ID: BH16-12-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
Moisture	BAL	4391389	N/A	2016/02/23	Chun Yan
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

Maxxam ID: BWJ267 Dup
Sample ID: BH16-12-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake

Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWJ268
Sample ID: BH16-9-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391123	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/23	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4386007	N/A	2016/02/24	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Total Organic Carbon in Triplicate	COMB	4392277	N/A	2016/02/24	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWJ269
Sample ID: BH16-9-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
Moisture	BAL	4391389	N/A	2016/02/23	Chun Yan
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

Maxxam ID: BWJ270
Sample ID: BH16-7-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/23	Georgeta Rusu

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Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWJ270
Sample ID: BH16-7-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4386007	N/A	2016/02/24	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
OC Pesticides (Selected) & PCB	GC/ECD	4390994	2016/02/23	2016/02/24	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4386008	N/A	2016/02/22	Automated Statchk
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Total Organic Carbon in Triplicate	COMB	4392277	N/A	2016/02/24	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWJ271
Sample ID: BH16-7-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
Moisture	BAL	4391389	N/A	2016/02/23	Chun Yan
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

Maxxam ID: BWJ272
Sample ID: BH16-6-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4386007	N/A	2016/02/24	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici

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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWJ272
Sample ID: BH16-6-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Total Organic Carbon in Triplicate	COMB	4392277	N/A	2016/02/24	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWJ272 Dup
Sample ID: BH16-6-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

Maxxam ID: BWJ273
Sample ID: BH16-6-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
Moisture	BAL	4391389	N/A	2016/02/23	Chun Yan
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

Maxxam ID: BWJ304
Sample ID: BH16-8-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391086	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/23	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
OC Pesticides (Selected) & PCB	GC/ECD	4390994	2016/02/23	2016/02/24	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4386008	N/A	2016/02/22	Automated Statchk

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Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWJ304
Sample ID: BH16-8-1
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/22	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWJ305
Sample ID: BH16-8-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4391123	2016/02/23	2016/02/23	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
Moisture	BAL	4391389	N/A	2016/02/23	Chun Yan
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai

Maxxam ID: BWJ306
Sample ID: DUP-2
Matrix: Soil

Collected: 2016/02/17
Shipped:
Received: 2016/02/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4386009	N/A	2016/02/24	Paul Rubinato
Hot Water Extractable Boron	ICP	4391123	2016/02/23	2016/02/23	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4385820	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4390893	2016/02/23	2016/02/23	Xuanhong Qiu
Conductivity	AT	4391460	2016/02/24	2016/02/24	Yogesh Patel
Hexavalent Chromium in Soil by IC	IC/SPEC	4389888	2016/02/22	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4390690	N/A	2016/02/23	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4391555	2016/02/23	2016/02/24	Zhiyue (Frank) Zhu
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4386258	2016/02/18	2016/02/22	Raigamage Perera
MOISTURE	BAL	4388264	N/A	2016/02/22	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4389620	2016/02/22	2016/02/23	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4389819	2016/02/22	2016/02/22	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4385800	N/A	2016/02/24	Automated Statchk
SAR - ICP Metals	ICP	4391456	2016/02/24	2016/02/24	Suban Kanapathippllai
Volatile Organic Compounds in Soil	GC/MS	4387772	N/A	2016/02/20	Anna Gabrielyan

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ARCADIS Canada Inc
Client Project #: 450271-000
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GENERAL COMMENTS

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

Package 1	2.3°C
Package 2	0.3°C

Custody seal was present and intact on the cooler.

Sample BWJ304-01 : OC Pesticide Analysis: Detection limits were adjusted for high moisture content.

O.REG 153 OC PESTICIDES (SOIL)

OC Pesticides (Selected) & PCB: The recoveries in the matrix spike were not calculated (NC) due to background interference.

Results relate only to the items tested.

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Maxxam Job #: B633057
Report Date: 2016/02/26

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4387772	4-Bromofluorobenzene	2016/02/19	96	60 - 140	99	60 - 140	98	%				
4387772	D10-o-Xylene	2016/02/19	87	60 - 130	83	60 - 130	90	%				
4387772	D4-1,2-Dichloroethane	2016/02/19	92	60 - 140	98	60 - 140	99	%				
4387772	D8-Toluene	2016/02/19	103	60 - 140	102	60 - 140	99	%				
4389620	D10-Anthracene	2016/02/22	74	50 - 130	76	50 - 130	79	%				
4389620	D14-Terphenyl (FS)	2016/02/22	73	50 - 130	72	50 - 130	72	%				
4389620	D8-Acenaphthylene	2016/02/22	67	50 - 130	69	50 - 130	65	%				
4390690	1,4-Difluorobenzene	2016/02/23	110	60 - 140	103	60 - 140	107	%				
4390690	4-Bromofluorobenzene	2016/02/23	109	60 - 140	109	60 - 140	104	%				
4390690	D10-Ethylbenzene	2016/02/23	98	60 - 140	76	60 - 140	94	%				
4390690	D4-1,2-Dichloroethane	2016/02/23	116	60 - 140	103	60 - 140	106	%				
4390994	2,4,5,6-Tetrachloro-m-xylene	2016/02/24	73	50 - 130	80	50 - 130	89	%				
4390994	Decachlorobiphenyl	2016/02/24	85	50 - 130	111	50 - 130	104	%				
4391555	o-Terphenyl	2016/02/24	102	60 - 130	99	60 - 130	97	%				
4386258	Acid Extractable Antimony (Sb)	2016/02/22	74 (1)	75 - 125	111	80 - 120	<0.2	ug/g	NC	35		
4386258	Acid Extractable Arsenic (As)	2016/02/22	97	75 - 125	109	80 - 120	<1	ug/g	NC	35		
4386258	Acid Extractable Barium (Ba)	2016/02/22	NC	75 - 125	108	80 - 120	<0.5	ug/g	1.2	35		
4386258	Acid Extractable Beryllium (Be)	2016/02/22	108	75 - 125	108	80 - 120	<0.2	ug/g	NC	35		
4386258	Acid Extractable Boron (B)	2016/02/22	100	75 - 125	110	80 - 120	<5	ug/g	NC	35		
4386258	Acid Extractable Cadmium (Cd)	2016/02/22	107	75 - 125	109	80 - 120	<0.1	ug/g	NC	35		
4386258	Acid Extractable Chromium (Cr)	2016/02/22	NC	75 - 125	109	80 - 120	<1	ug/g	2.7	35		
4386258	Acid Extractable Cobalt (Co)	2016/02/22	NC	75 - 125	113	80 - 120	<0.1	ug/g	2.4	35		
4386258	Acid Extractable Copper (Cu)	2016/02/22	NC	75 - 125	109	80 - 120	<0.5	ug/g	3.3	35		
4386258	Acid Extractable Lead (Pb)	2016/02/22	107	75 - 125	110	80 - 120	<1	ug/g	1.2	35		
4386258	Acid Extractable Mercury (Hg)	2016/02/22	105	75 - 125	107	80 - 120	<0.05	ug/g	NC	35		
4386258	Acid Extractable Molybdenum (Mo)	2016/02/22	106	75 - 125	109	80 - 120	<0.5	ug/g	NC	35		
4386258	Acid Extractable Nickel (Ni)	2016/02/22	NC	75 - 125	110	80 - 120	<0.5	ug/g	1.8	35		
4386258	Acid Extractable Selenium (Se)	2016/02/22	94	75 - 125	112	80 - 120	<0.5	ug/g	NC	35		
4386258	Acid Extractable Silver (Ag)	2016/02/22	106	75 - 125	108	80 - 120	<0.2	ug/g	NC	35		
4386258	Acid Extractable Thallium (Tl)	2016/02/22	106	75 - 125	111	80 - 120	<0.05	ug/g	0.89	35		
4386258	Acid Extractable Uranium (U)	2016/02/22	111	75 - 125	114	80 - 120	<0.05	ug/g	0.15	25		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4386258	Acid Extractable Vanadium (V)	2016/02/22	NC	75 - 125	114	80 - 120	<5	ug/g	1.3	35		
4386258	Acid Extractable Zinc (Zn)	2016/02/22	NC	75 - 125	111	80 - 120	<5	ug/g	2.9	35		
4387772	1,1,1,2-Tetrachloroethane	2016/02/19	92	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4387772	1,1,1-Trichloroethane	2016/02/19	93	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4387772	1,1,2,2-Tetrachloroethane	2016/02/19	84	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4387772	1,1,2-Trichloroethane	2016/02/19	92	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4387772	1,1-Dichloroethane	2016/02/19	94	60 - 140	91	60 - 130	<0.050	ug/g	NC	50		
4387772	1,1-Dichloroethylene	2016/02/19	99	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4387772	1,2-Dichlorobenzene	2016/02/19	84	60 - 140	80	60 - 130	<0.050	ug/g	NC	50		
4387772	1,2-Dichloroethane	2016/02/19	90	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4387772	1,2-Dichloropropane	2016/02/19	92	60 - 140	91	60 - 130	<0.050	ug/g	NC	50		
4387772	1,3-Dichlorobenzene	2016/02/19	86	60 - 140	78	60 - 130	<0.050	ug/g	NC	50		
4387772	1,4-Dichlorobenzene	2016/02/19	86	60 - 140	79	60 - 130	<0.050	ug/g	NC	50		
4387772	Acetone (2-Propanone)	2016/02/19	78	60 - 140	89	60 - 140	<0.50	ug/g	NC	50		
4387772	Benzene	2016/02/19	95	60 - 140	92	60 - 130	<0.020	ug/g	NC	50		
4387772	Bromodichloromethane	2016/02/19	101	60 - 140	102	60 - 130	<0.050	ug/g	NC	50		
4387772	Bromoform	2016/02/19	80	60 - 140	84	60 - 130	<0.050	ug/g	NC	50		
4387772	Bromomethane	2016/02/19	86	60 - 140	80	60 - 140	<0.050	ug/g	NC	50		
4387772	Carbon Tetrachloride	2016/02/19	95	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4387772	Chlorobenzene	2016/02/19	98	60 - 140	93	60 - 130	<0.050	ug/g	NC	50		
4387772	Chloroform	2016/02/19	93	60 - 140	91	60 - 130	<0.050	ug/g	NC	50		
4387772	cis-1,2-Dichloroethylene	2016/02/19	94	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4387772	cis-1,3-Dichloropropene	2016/02/19	87	60 - 140	85	60 - 130	<0.030	ug/g	NC	50		
4387772	Dibromochloromethane	2016/02/19	89	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4387772	Dichlorodifluoromethane (FREON 12)	2016/02/19	86	60 - 140	81	60 - 140	<0.050	ug/g	NC	50		
4387772	Ethylbenzene	2016/02/19	99	60 - 140	92	60 - 130	<0.020	ug/g	NC	50		
4387772	Ethylene Dibromide	2016/02/19	90	60 - 140	91	60 - 130	<0.050	ug/g	NC	50		
4387772	Hexane	2016/02/19	107	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4387772	Methyl Ethyl Ketone (2-Butanone)	2016/02/19	79	60 - 140	92	60 - 140	<0.50	ug/g	NC	50		
4387772	Methyl Isobutyl Ketone	2016/02/19	77	60 - 140	88	60 - 130	<0.50	ug/g	NC	50		
4387772	Methyl t-butyl ether (MTBE)	2016/02/19	91	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		

Maxxam Job #: B633057
Report Date: 2016/02/26

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4387772	Methylene Chloride(Dichloromethane)	2016/02/19	91	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4387772	o-Xylene	2016/02/19	97	60 - 140	91	60 - 130	<0.020	ug/g	NC	50		
4387772	p+m-Xylene	2016/02/19	97	60 - 140	90	60 - 130	<0.020	ug/g	NC	50		
4387772	Styrene	2016/02/19	92	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4387772	Tetrachloroethylene	2016/02/19	100	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4387772	Toluene	2016/02/19	98	60 - 140	90	60 - 130	<0.020	ug/g	NC	50		
4387772	Total Xylenes	2016/02/19					<0.020	ug/g	NC	50		
4387772	trans-1,2-Dichloroethylene	2016/02/19	95	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4387772	trans-1,3-Dichloropropene	2016/02/19	87	60 - 140	81	60 - 130	<0.040	ug/g	NC	50		
4387772	Trichloroethylene	2016/02/19	93	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4387772	Trichlorofluoromethane (FREON 11)	2016/02/19	97	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4387772	Vinyl Chloride	2016/02/19	95	60 - 140	89	60 - 130	<0.020	ug/g	NC	50		
4388264	Moisture	2016/02/22							0.88	50		
4389620	1-Methylnaphthalene	2016/02/22	62	50 - 130	63	50 - 130	<0.0050	ug/g	NC	40		
4389620	2-Methylnaphthalene	2016/02/22	62	50 - 130	61	50 - 130	<0.0050	ug/g	NC	40		
4389620	Acenaphthene	2016/02/22	59	50 - 130	60	50 - 130	<0.0050	ug/g	NC	40		
4389620	Acenaphthylene	2016/02/22	56	50 - 130	57	50 - 130	<0.0050	ug/g	NC	40		
4389620	Anthracene	2016/02/22	62	50 - 130	61	50 - 130	<0.0050	ug/g	NC	40		
4389620	Benzo(a)anthracene	2016/02/22	60	50 - 130	59	50 - 130	<0.0050	ug/g	NC	40		
4389620	Benzo(a)pyrene	2016/02/22	66	50 - 130	65	50 - 130	<0.0050	ug/g	NC	40		
4389620	Benzo(b/j)fluoranthene	2016/02/22	68	50 - 130	70	50 - 130	<0.0050	ug/g	NC	40		
4389620	Benzo(g,h,i)perylene	2016/02/22	63	50 - 130	68	50 - 130	<0.0050	ug/g	NC	40		
4389620	Benzo(k)fluoranthene	2016/02/22	69	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4389620	Chrysene	2016/02/22	62	50 - 130	60	50 - 130	<0.0050	ug/g	NC	40		
4389620	Dibenz(a,h)anthracene	2016/02/22	62	50 - 130	66	50 - 130	<0.0050	ug/g	NC	40		
4389620	Fluoranthene	2016/02/22	64	50 - 130	62	50 - 130	<0.0050	ug/g	NC	40		
4389620	Fluorene	2016/02/22	62	50 - 130	62	50 - 130	<0.0050	ug/g	NC	40		
4389620	Indeno(1,2,3-cd)pyrene	2016/02/22	66	50 - 130	70	50 - 130	<0.0050	ug/g	NC	40		
4389620	Naphthalene	2016/02/22	60	50 - 130	60	50 - 130	<0.0050	ug/g	NC	40		
4389620	Phenanthrene	2016/02/22	60	50 - 130	59	50 - 130	<0.0050	ug/g	NC	40		
4389620	Pyrene	2016/02/22	60	50 - 130	60	50 - 130	<0.0050	ug/g	NC	40		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4389819	Available (CaCl2) pH	2016/02/22			99	97 - 103			1.6	N/A		
4389888	Chromium (VI)	2016/02/23	56 (2)	75 - 125	102	80 - 120	<0.2	ug/g	NC	35	86	N/A
4390690	F1 (C6-C10) - BTEX	2016/02/23					<10	ug/g	8.6	30		
4390690	F1 (C6-C10)	2016/02/23	NC	60 - 140	89	80 - 120	<10	ug/g	8.6	30		
4390893	Free Cyanide	2016/02/23	109	75 - 125	102	80 - 120	<0.01	ug/g	NC	35		
4390994	a-Chlordane	2016/02/24	NC	50 - 130	77	50 - 130	<0.0020	ug/g				
4390994	Aldrin	2016/02/24	NC	50 - 130	80	50 - 130	<0.0020	ug/g				
4390994	Aroclor 1242	2016/02/24					<0.015	ug/g	NC	40		
4390994	Aroclor 1248	2016/02/24					<0.015	ug/g				
4390994	Aroclor 1254	2016/02/24					<0.015	ug/g				
4390994	Aroclor 1260	2016/02/24					<0.015	ug/g				
4390994	Dieldrin	2016/02/24	NC	50 - 130	89	50 - 130	<0.0020	ug/g				
4390994	Endosulfan I (alpha)	2016/02/24	NC	50 - 130	78	50 - 130	<0.0020	ug/g				
4390994	Endosulfan II (beta)	2016/02/24	NC	50 - 130	70	50 - 130	<0.0020	ug/g				
4390994	Endrin	2016/02/24	NC	50 - 130	106	50 - 130	<0.0020	ug/g	NC	40		
4390994	g-Chlordane	2016/02/24	NC	50 - 130	80	50 - 130	<0.0020	ug/g				
4390994	Heptachlor epoxide	2016/02/24	NC	50 - 130	74	50 - 130	<0.0020	ug/g	NC	40		
4390994	Heptachlor	2016/02/24	NC	50 - 130	86	50 - 130	<0.0020	ug/g	NC	40		
4390994	Hexachlorobenzene	2016/02/24	NC	50 - 130	90	50 - 130	<0.0020	ug/g				
4390994	Hexachlorobutadiene	2016/02/24	NC	50 - 130	96	50 - 130	<0.0050	ug/g				
4390994	Hexachloroethane	2016/02/24	NC	50 - 130	80	50 - 130	<0.0050	ug/g				
4390994	Lindane	2016/02/24	NC	50 - 130	78	50 - 130	<0.0020	ug/g	NC	40		
4390994	Methoxychlor	2016/02/24	NC	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40		
4390994	o,p-DDD	2016/02/24	NC	50 - 130	100	50 - 130	<0.0020	ug/g				
4390994	o,p-DDE	2016/02/24	NC	50 - 130	89	50 - 130	<0.0020	ug/g				
4390994	o,p-DDT	2016/02/24	NC	50 - 130	99	50 - 130	<0.0020	ug/g				
4390994	p,p-DDD	2016/02/24	NC	50 - 130	77	50 - 130	<0.0020	ug/g				
4390994	p,p-DDE	2016/02/24	NC	50 - 130	94	50 - 130	<0.0020	ug/g				
4390994	p,p-DDT	2016/02/24	NC	50 - 130	87	50 - 130	<0.0020	ug/g				
4391086	Hot Water Ext. Boron (B)	2016/02/23	110	75 - 125	110	75 - 125	<0.050	ug/g	13	40		
4391123	Hot Water Ext. Boron (B)	2016/02/23	106	75 - 125	103	75 - 125	<0.050	ug/g	NC	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4391389	Moisture	2016/02/23							1.0	20		
4391456	Soluble Calcium (Ca)	2016/02/24			94	80 - 120	<0.5	mg/L	1.3	30		
4391456	Soluble Magnesium (Mg)	2016/02/24			97	80 - 120	<0.5	mg/L	2.6	30		
4391456	Soluble Sodium (Na)	2016/02/24			95	80 - 120	<5	mg/L	4.2	30		
4391460	Conductivity	2016/02/24			100	90 - 110	<0.002	mS/cm	0	10		
4391555	F2 (C10-C16 Hydrocarbons)	2016/02/24	103	50 - 130	99	80 - 120	<10	ug/g	NC	30		
4391555	F3 (C16-C34 Hydrocarbons)	2016/02/24	105	50 - 130	104	80 - 120	<50	ug/g	NC	30		
4391555	F4 (C34-C50 Hydrocarbons)	2016/02/24	109	50 - 130	109	80 - 120	<50	ug/g	NC	30		
4392277	Total Organic Carbon (repeat #1)	2016/02/24					N/A***, RDL=500	mg/kg				
4392277	Total Organic Carbon (repeat #2)	2016/02/24					N/A***, RDL=500	mg/kg				
4392277	Total Organic Carbon	2016/02/24					<500	mg/kg			115	75 - 125

N/A = Not Applicable

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

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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

(2) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The matrix spike was reanalyzed to confirm result.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B633057
Report Date: 2016/02/26

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Specialist

Cristina Carriere, Scientific Services

Paul Rubinato, Analyst, Maxxam Analytics

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

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

CHAIN OF CUSTODY RECORD

Page 1 of 2

INVOICE TO:
Company Name: #10988 ARCADIS Canada Inc
Attention: Invoices Attention
Address: 329 Churchill Ave N Suite 200, Ottawa ON K1Z 5B8
Tel: (613) 721-0555 Fax: (613) 721-0029
Email: invoicesottawa@arcadis.com, barb.adelman@arcadis-c

REPORT TO:
Company Name:
Attention: Alisha Williamson
Address:
Tel: Fax:
Email: alisha.williamson@arcadis-canada.com

PROJECT INFORMATION:
Quotation #: B60807
P.O. #:
Project: 450271-000
Project Name:
Site #:
Sampled By: C. Davis

Laboratory Use Only:
Maxxam Job #:
Bottle Order #: 548176
COC #: C#548176-05-01
Project Manager: Parnian Baber

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 5

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558. ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)?

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: *(call lab for #)*

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs & F1-F4 (Soil)	O.Reg 153 OC Pesticides (Soil)	O.Reg 153 Metals & Inorganics Pkg (Wtr)	O.Reg 153 PAHs (Water)	O.Reg 153 VOCs & F1-F4 (Water)	O.Reg 153 OC Pesticides (Water)	FOC		# of Bottles	Comments
1		BH16-14-1	17/02/16	1pm	Soil	No	X	X	X						X		8	
2		BH16-14-2	17/02/16	1:30pm	Soil	No	X										1	
3		BH16-12-1	17/02/16	1:45pm	Soil	No	X	X	X	X					X		9	
4		BH16-12-2	17/02/16	1:55pm	Soil	No	X										1	
5		BH16-9-1	17/02/16	2pm	Soil	No	X	X	X						X		8	
6		BH16-9-2	17/02/16	2:15pm	Soil	No	X										1	
7		BH16-7-1	17/02/16	2:25pm	Soil	No	X	X	X	X					X		9	
8		BH16-7-2	17/02/16	2:35pm	Soil	No	X										1	
9		BH16-6-1	17/02/16	2:50pm	Soil	No	X	X	X						X		8	
10		BH16-6-2	17/02/16	3:15pm	Soil	No	X										1	

18-Feb-16 09:30
Parnian Baber
B633057
RECEIVED IN OTTAWA
ON ICE

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Chris Davis	16/02/17	0pm	HA Fatemeh	2016/02/18	9:30	
		7				

Laboratory Use Only
Time Sensitive
Temperature (°C) on Receipt: 0, 2, 5
Custody Seal: Present ✓ Intact ✓ (Yes / No)

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

-1, 0, 2

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B60807	Maxxam Job #:	Bottle Order #:
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			548176
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Project Name:		C#548176-06-01	Parnian Baber
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	C. DAVIS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 5	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558. ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? _____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs & F1-F4 (Soil)	O.Reg 153 OC Pesticides (Soil)	O.Reg 153 Metals & Inorganics Pkg (Wtr)	O.Reg 153 PAHs (Water)	O.Reg 153 VOCs & F1-F4 (Water)	O.Reg 153 OC Pesticides (Water)			# of Bottles	Comments
1		BH16-8-1	17/02/16	3:30pm	Soil	No	X	X	X	X							7	
2		BH16-8-2	17/02/16	3:45pm	Soil	No	X										1	
3		DUP-2	17/02/16	1pm	Soil	No	X	X	X								6	
4																		
5																		
6																		
7																		RECEIVED IN OTTAWA
8																		
9																		ON ICE
10																		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Chris Davis	16/02/17	6pm	Fatemeh	16/02/18	9:30		Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
								0, 2, 5	Present	✓	
									Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

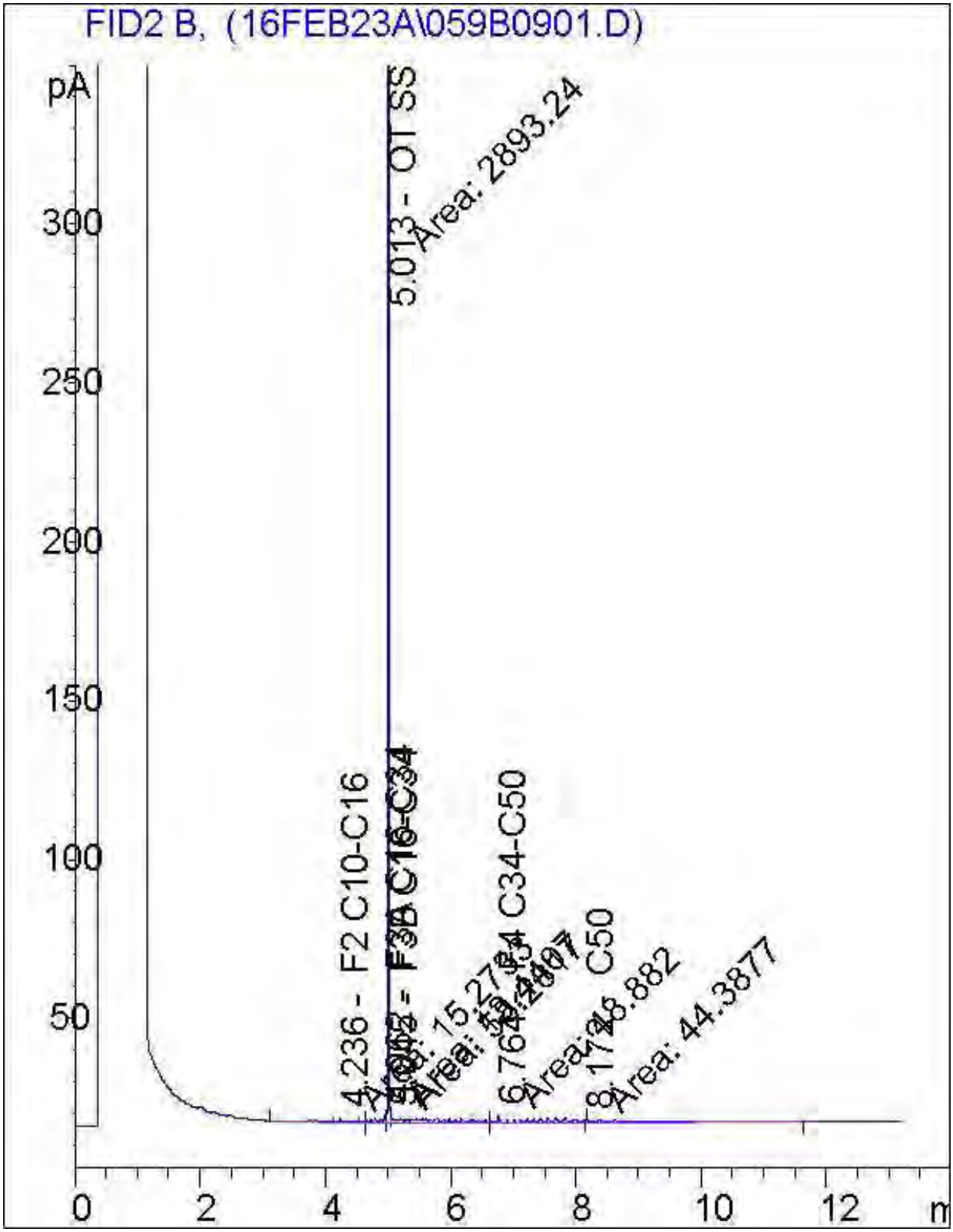
Maxxam Analytics International Corporation o/a Maxxam Analytics

-1, 0, 2

Maxxam Job #: B633057
Report Date: 2016/02/26
Maxxam Sample: BWJ264

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-14-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

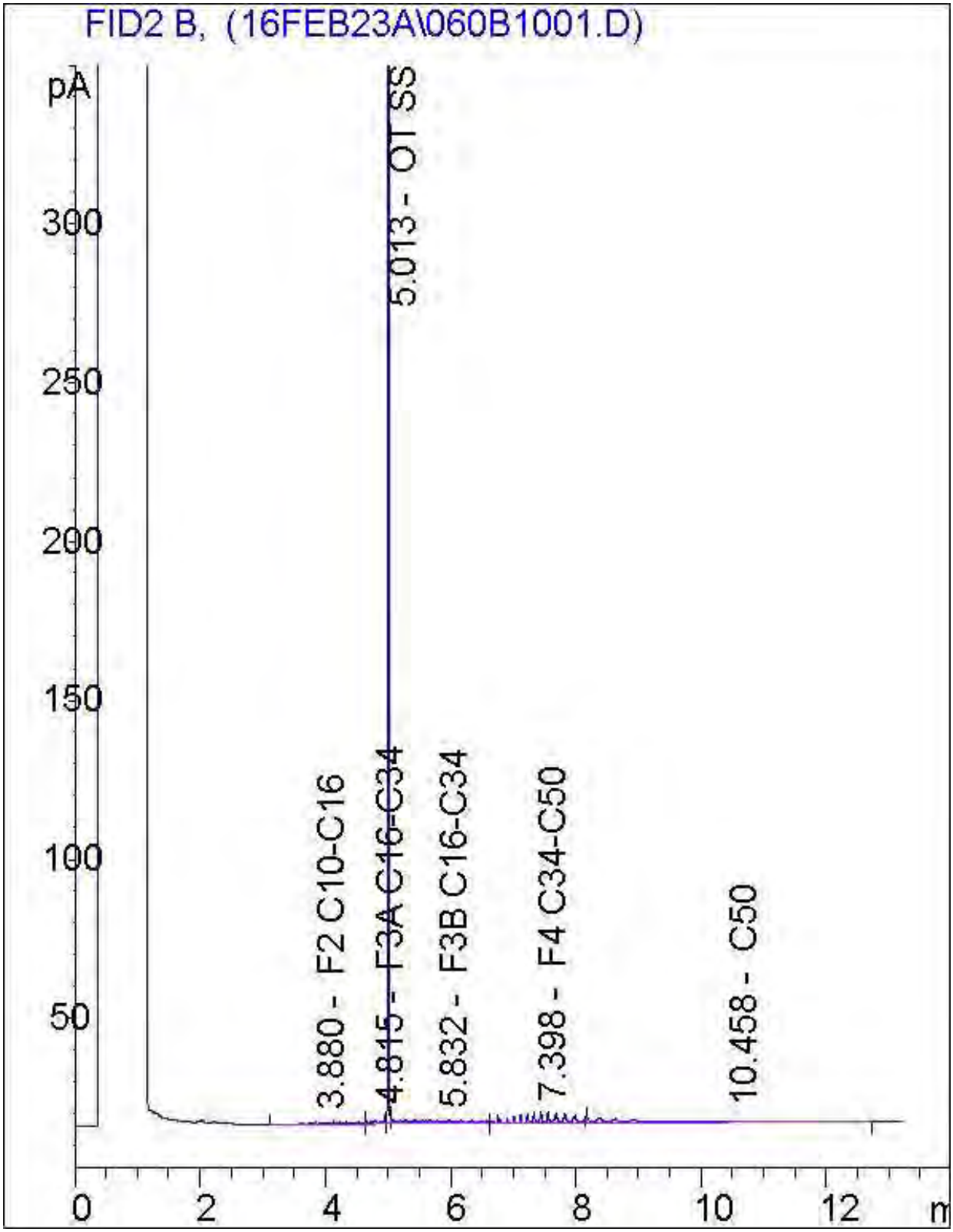


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B633057
Report Date: 2016/02/26
Maxxam Sample: BWJ266

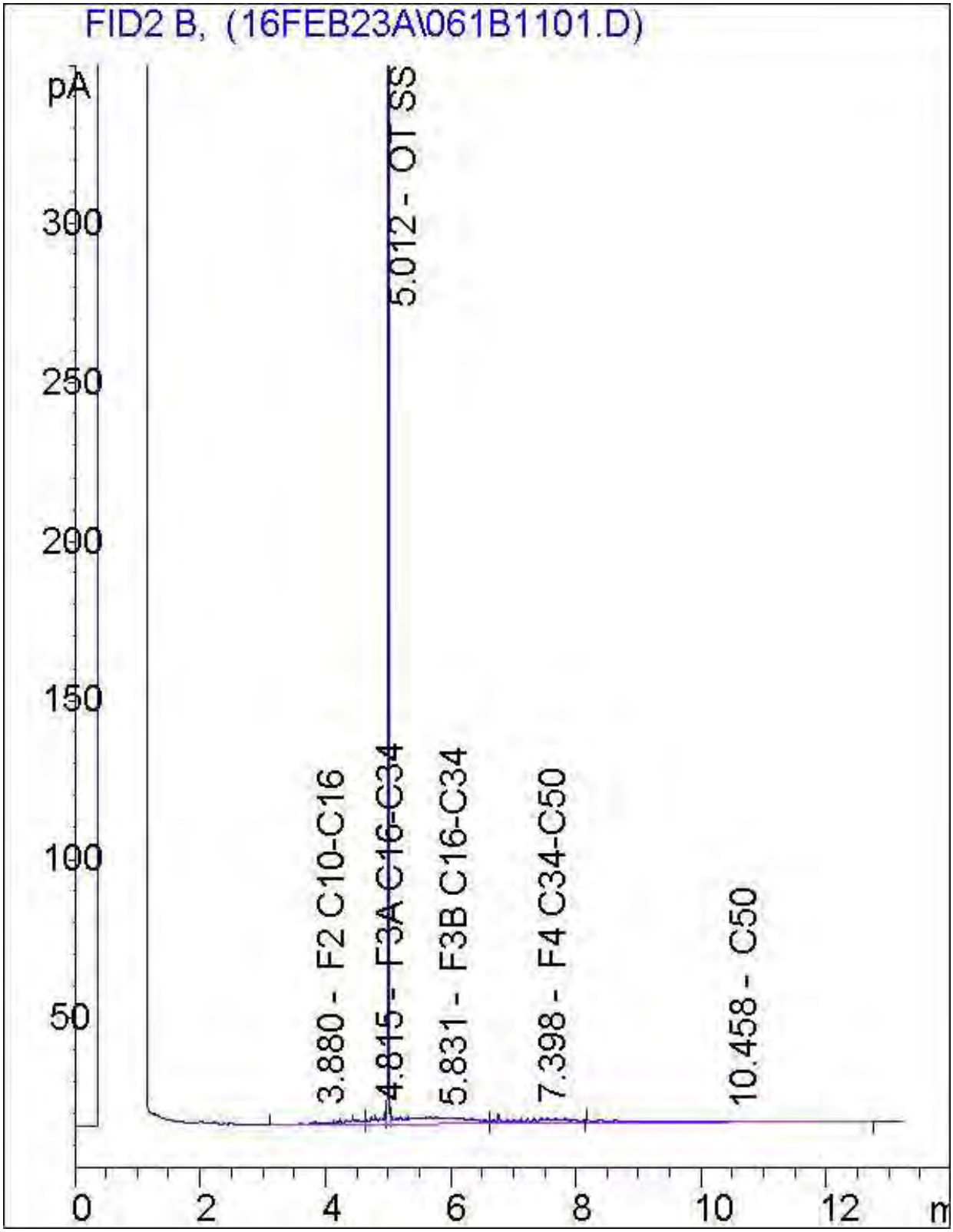
ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-12-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

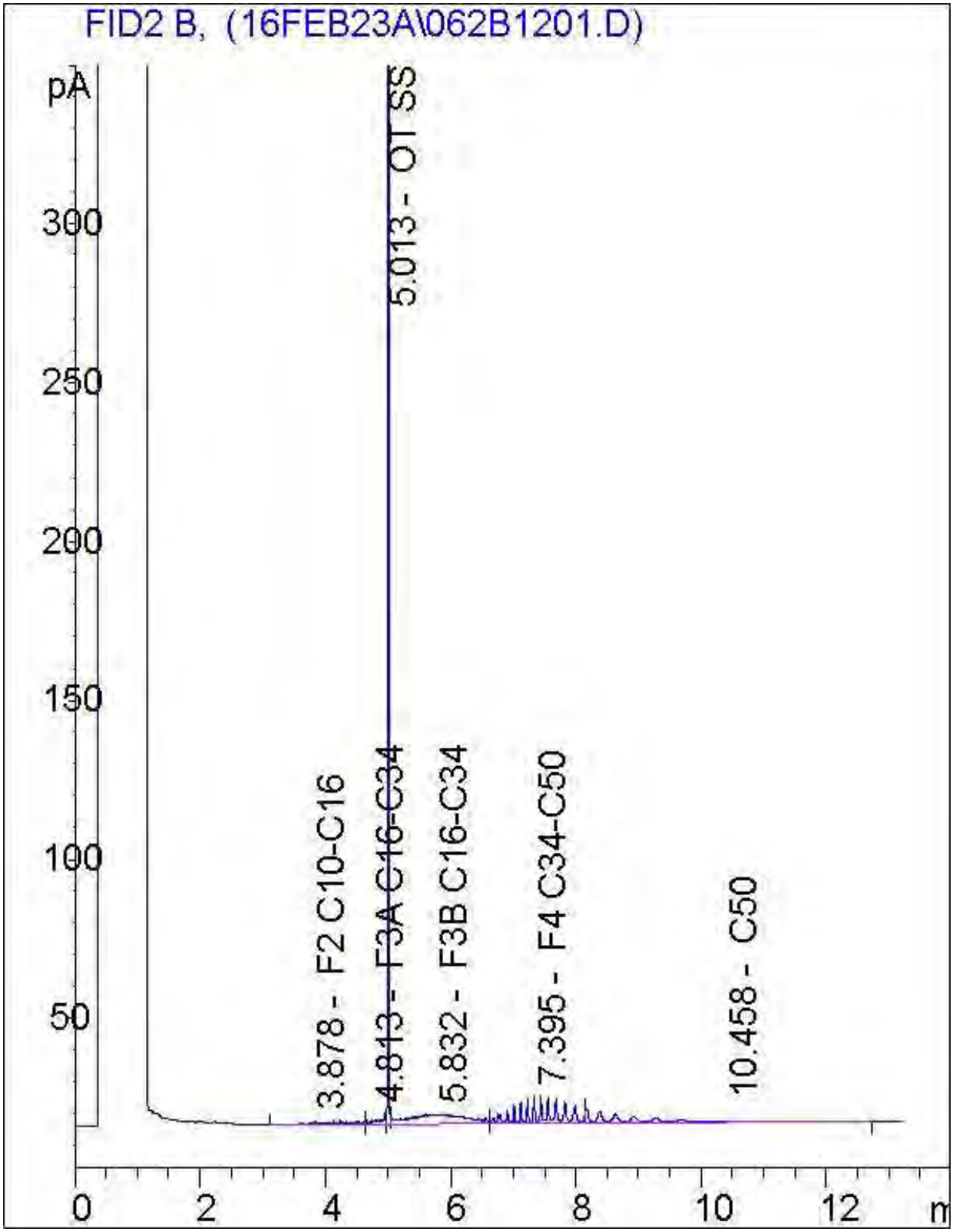


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B633057
Report Date: 2016/02/26
Maxxam Sample: BWJ270

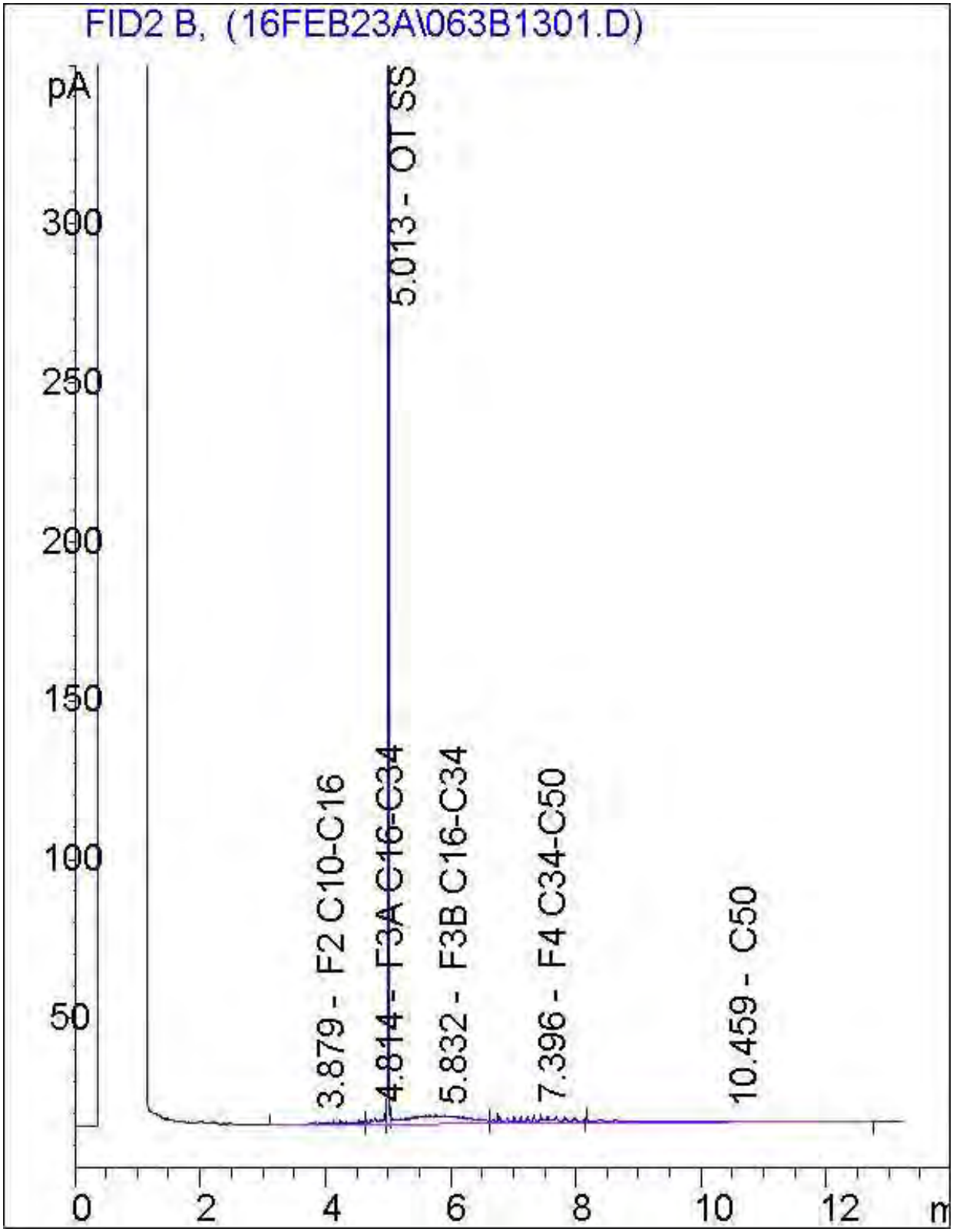
ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-7-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

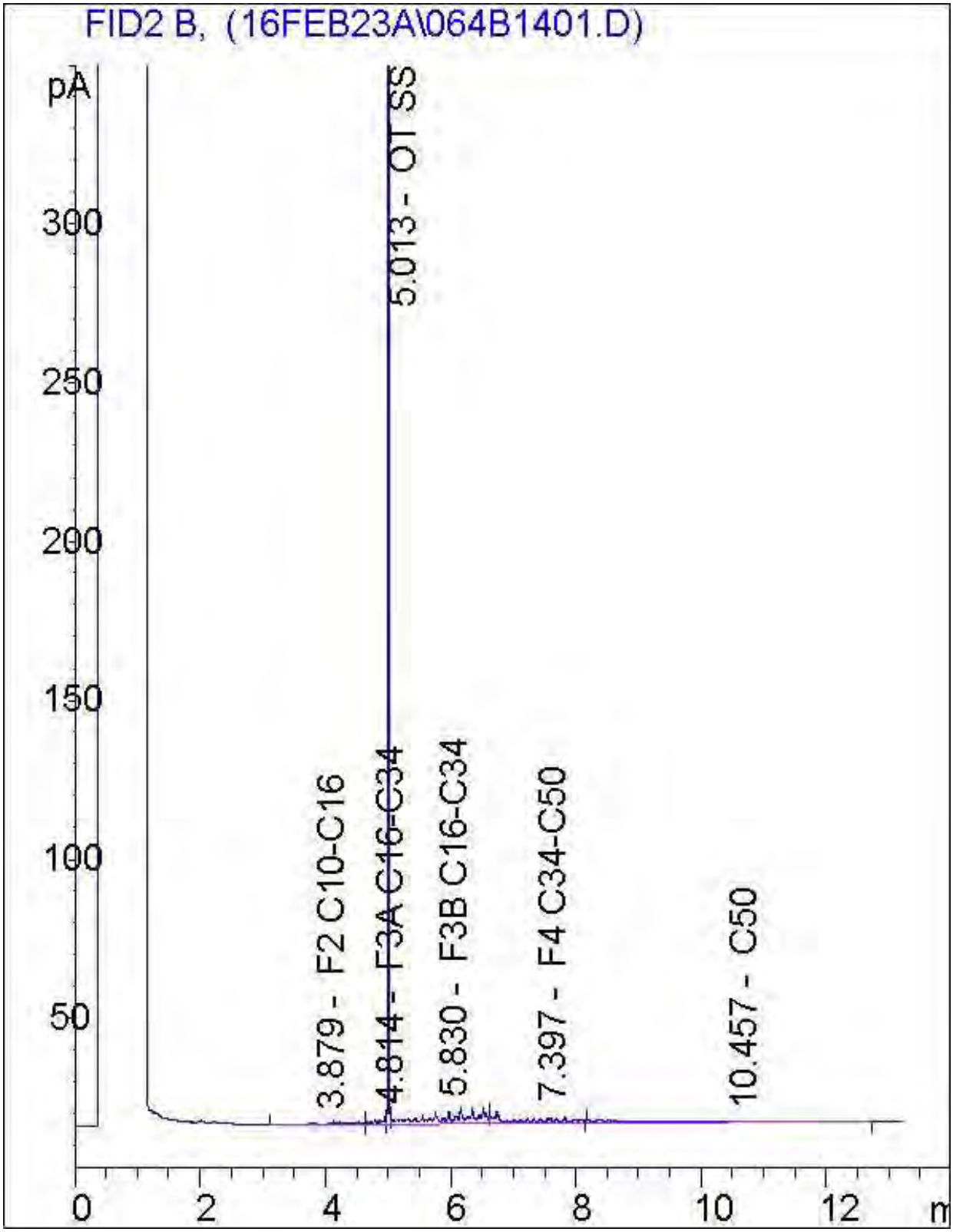


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B633057
Report Date: 2016/02/26
Maxxam Sample: BWJ304

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-8-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

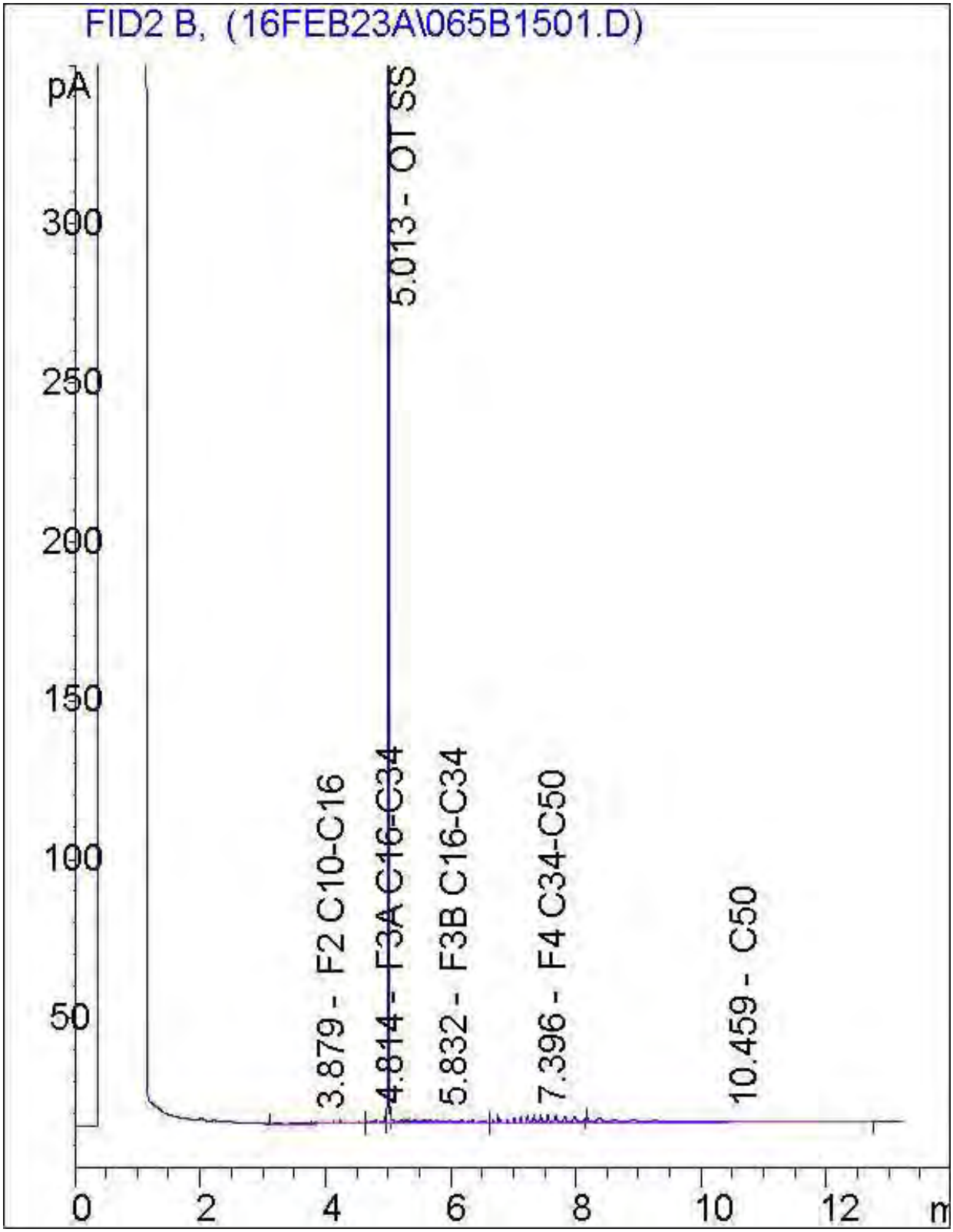


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B633057
Report Date: 2016/02/26
Maxxam Sample: BWJ306

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: DUP-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 548176-04-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/03/08
Report #: R3921435
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B632361
Received: 2016/02/17, 13:50

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	4	N/A	2016/02/23	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	7	2016/02/22	2016/02/22	CAM SOP-00408	R153 Ana. Prot. 2011
Hot Water Extractable Boron (1)	1	2016/03/08	2016/03/08	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	4	N/A	2016/02/22		EPA 8260C m
Free (WAD) Cyanide (1)	7	2016/02/19	2016/02/22	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide (1)	1	2016/03/07	2016/03/08	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	7	2016/02/22	2016/02/23	CAM SOP-00414	OMOE E3138 v2 m
Conductivity (1)	1	2016/03/08	2016/03/08	CAM SOP-00414	OMOE E3138 v2 m
Hexavalent Chromium in Soil by IC (1, 2)	7	2016/02/19	2016/02/23	CAM SOP-00436	EPA 3060/7199 m
Hexavalent Chromium in Soil by IC (1, 2)	1	2016/03/07	2016/03/08	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 3)	4	N/A	2016/02/22	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 4)	4	2016/02/22	2016/02/23	CAM SOP-00316	CCME CWS m
Fraction Organic Carbon in Triplicate (1)	3	N/A	2016/02/22	CAM SOP-00468	Lloyd Kahn Method
Strong Acid Leachable Metals by ICPMS (1)	1	2016/03/07	2016/03/08	CAM SOP-00447	EPA 6020A m
Acid Extr. Metals (aqua regia) by ICPMS	7	2016/02/18	2016/02/19	OTT SOP-00003	EPA 6020
MOISTURE	4	N/A	2016/02/19	CAM SOP-00445	McKeague 2nd ed 1978
Moisture (1)	4	N/A	2016/02/22	CAM SOP-00445	Carter 2nd ed 51.2 m
OC Pesticides (Selected) & PCB (1, 5)	1	2016/02/23	2016/02/25	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters (1)	1	N/A	2016/02/19	CAM SOP-00307	EPA 8081/8082 m
PAH Compounds in Soil by GC/MS (SIM)	4	2016/02/18	2016/02/18	OTT SOP-00011	EPA 8270D m
pH CaCl2 EXTRACT (1)	7	2016/02/19	2016/02/19	CAM SOP-00413	EPA 9045 D m
pH CaCl2 EXTRACT (1)	1	2016/03/04	2016/03/04	CAM SOP-00413	EPA 9045 D m
Sieve, 75um (1)	1	N/A	2016/02/22	CAM SOP-00467	Carter 2nd ed m
Sodium Adsorption Ratio (SAR) (1)	7	N/A	2016/02/23	CAM SOP-00102	EPA 6010
Sodium Adsorption Ratio (SAR) (1)	1	N/A	2016/03/08	CAM SOP-00102	EPA 6010
SAR - ICP Metals (1)	7	2016/02/23	2016/02/23	CAM SOP-00408	EPA 6010 m
SAR - ICP Metals (1)	1	2016/03/08	2016/03/08	CAM SOP-00408	EPA 6010 m
Total Organic Carbon in Triplicate (1)	3	N/A	2016/02/23	CAM SOP-00468	Lloyd Kahn Method
Volatile Organic Compounds in Soil (1)	4	N/A	2016/02/20	CAM SOP000228	EPA 8260C m

Your Project #: 450271-000
Your C.O.C. #: 548176-04-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/03/08
Report #: R3921435
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B632361
Received: 2016/02/17, 13:50

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWG382		
Sampling Date		2016/02/16 10:00		
COC Number		548176-04-01		
	UNITS	**BH16-10-1**	**RDL**	**QC Batch**
Calculated Parameters				
Sodium Adsorption Ratio	N/A	0.94		4401378
Inorganics				
Conductivity	mS/cm	0.27	0.002	4407960
Free Cyanide	ug/g	<0.01	0.01	4407579
Available (CaCl2) pH	pH	7.43		4405601
Metals				
Soluble Calcium (Ca)	mg/L	16.8	0.5	4407947
Soluble Magnesium (Mg)	mg/L	12.6	0.5	4407947
Soluble Sodium (Na)	mg/L	21	5	4407947
Inorganics				
Chromium (VI)	ug/g	<0.2	0.2	4407716
Metals				
Hot Water Ext. Boron (B)	ug/g	0.089	0.050	4408966
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	4407836
Acid Extractable Arsenic (As)	ug/g	1.4	1.0	4407836
Acid Extractable Barium (Ba)	ug/g	290	0.50	4407836
Acid Extractable Beryllium (Be)	ug/g	0.81	0.20	4407836
Acid Extractable Boron (B)	ug/g	5.0	5.0	4407836
Acid Extractable Cadmium (Cd)	ug/g	0.15	0.10	4407836
Acid Extractable Chromium (Cr)	ug/g	130	1.0	4407836
Acid Extractable Cobalt (Co)	ug/g	23	0.10	4407836
Acid Extractable Copper (Cu)	ug/g	56	0.50	4407836
Acid Extractable Lead (Pb)	ug/g	8.7	1.0	4407836
Acid Extractable Molybdenum (Mo)	ug/g	0.53	0.50	4407836
Acid Extractable Nickel (Ni)	ug/g	72	0.50	4407836
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	4407836
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	4407836
Acid Extractable Thallium (Tl)	ug/g	0.40	0.050	4407836
Acid Extractable Uranium (U)	ug/g	1.2	0.050	4407836
Acid Extractable Vanadium (V)	ug/g	110	5.0	4407836
Acid Extractable Zinc (Zn)	ug/g	120	5.0	4407836
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	4407836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWG383	BWG384	BWG385	BWG386	BWG387		
Sampling Date		2016/02/16 10:30	2016/02/16 11:00	2016/02/16 11:30	2016/02/16 12:30	2016/02/16 13:00		
COC Number		548176-04-01	548176-04-01	548176-04-01	548176-04-01	548176-04-01		
	UNITS	**BH16-10-2**	**BH16-11-1**	**BH16-11-2**	**BH16-13-1**	**BH16-13-2**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A	1.0	0.58	1.3	1.1	1.1		4384191
Inorganics								
Conductivity	mS/cm	0.22	1.9	0.30	0.81	0.34	0.002	4390150
Free Cyanide	ug/g	<0.01	<0.01	<0.01	0.03	<0.01	0.01	4388417
Moisture	%	29	10	32		33	1.0	4389919
Available (CaCl2) pH	pH	7.59	7.73	7.82	7.75	7.44		4387626
Metals								
Soluble Calcium (Ca)	mg/L	13.6	387	14.5	81.2	17.7	0.5	4390133
Soluble Magnesium (Mg)	mg/L	9.8	37.7	12.3	29.9	13.7	0.5	4390133
Soluble Sodium (Na)	mg/L	20	45	28	44	24	5	4390133
Inorganics								
Chromium (VI)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	4387971
Metals								
Hot Water Ext. Boron (B)	ug/g	0.12	0.35	0.17	0.37	0.096	0.050	4389622
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	4385843
Acid Extractable Arsenic (As)	ug/g	1	3	1	2	2	1	4385843
Acid Extractable Barium (Ba)	ug/g	290	440	360	280	240	0.5	4385843
Acid Extractable Beryllium (Be)	ug/g	0.9	0.5	0.9	1.0	1.0	0.2	4385843
Acid Extractable Boron (B)	ug/g	6	10	6	7	8	5	4385843
Acid Extractable Cadmium (Cd)	ug/g	<0.1	<0.1	<0.1	0.1	<0.1	0.1	4385843
Acid Extractable Chromium (Cr)	ug/g	150	11	130	170	150	1	4385843
Acid Extractable Cobalt (Co)	ug/g	27	6.0	24	25	27	0.1	4385843
Acid Extractable Copper (Cu)	ug/g	53	5.8	50	60	53	0.5	4385843
Acid Extractable Lead (Pb)	ug/g	9	10	7	10	10	1	4385843
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4385843
Acid Extractable Molybdenum (Mo)	ug/g	0.7	<0.5	0.7	0.6	0.5	0.5	4385843
Acid Extractable Nickel (Ni)	ug/g	83	13	68	88	82	0.5	4385843
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	0.5	<0.5	0.5	0.5	4385843
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	4385843
Acid Extractable Thallium (Tl)	ug/g	0.42	0.14	0.51	0.44	0.38	0.05	4385843
Acid Extractable Uranium (U)	ug/g	1.1	0.51	1.0	1.3	1.1	0.05	4385843
Acid Extractable Vanadium (V)	ug/g	110	8	130	120	100	5	4385843
Acid Extractable Zinc (Zn)	ug/g	120	17	130	130	110	5	4385843

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		BWG388	BWG389		
Sampling Date		2016/02/16 14:00	2016/02/16 15:00		
COC Number		548176-04-01	548176-04-01		
	UNITS	**BH16-5-1**	**BH16-5-2**	**RDL**	**QC Batch**
Calculated Parameters					
Sodium Adsorption Ratio	N/A	0.79	1.5		4384191
Inorganics					
Conductivity	mS/cm	0.32	0.24	0.002	4390150
Free Cyanide	ug/g	<0.01	<0.01	0.01	4388417
Available (CaCl2) pH	pH	7.36	7.92		4387626
Metals					
Soluble Calcium (Ca)	mg/L	25.8	13.1	0.5	4390133
Soluble Magnesium (Mg)	mg/L	14.2	8.0	0.5	4390133
Soluble Sodium (Na)	mg/L	20	27	5	4390133
Inorganics					
Chromium (VI)	ug/g	<0.2	<0.2	0.2	4387971
Metals					
Hot Water Ext. Boron (B)	ug/g	0.068	0.21	0.050	4389622
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	0.2	4385843
Acid Extractable Arsenic (As)	ug/g	3	2	1	4385843
Acid Extractable Barium (Ba)	ug/g	200	240	0.5	4385843
Acid Extractable Beryllium (Be)	ug/g	0.5	0.9	0.2	4385843
Acid Extractable Boron (B)	ug/g	14	11	5	4385843
Acid Extractable Cadmium (Cd)	ug/g	<0.1	0.1	0.1	4385843
Acid Extractable Chromium (Cr)	ug/g	21	150	1	4385843
Acid Extractable Cobalt (Co)	ug/g	8.7	27	0.1	4385843
Acid Extractable Copper (Cu)	ug/g	18	56	0.5	4385843
Acid Extractable Lead (Pb)	ug/g	10	10	1	4385843
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	0.05	4385843
Acid Extractable Molybdenum (Mo)	ug/g	1.3	0.7	0.5	4385843
Acid Extractable Nickel (Ni)	ug/g	19	83	0.5	4385843
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	0.5	4385843
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	0.2	4385843
Acid Extractable Thallium (Tl)	ug/g	0.22	0.35	0.05	4385843
Acid Extractable Uranium (U)	ug/g	0.48	2.6	0.05	4385843
Acid Extractable Vanadium (V)	ug/g	22	100	5	4385843
Acid Extractable Zinc (Zn)	ug/g	36	120	5	4385843

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		BWG386		
Sampling Date		2016/02/16 12:30		
COC Number		548176-04-01		
	UNITS	**BH16-13-1**	**RDL**	**QC Batch**
Pesticides & Herbicides				
Aldrin	ug/g	<0.0030	0.0030	4391662
a-Chlordane	ug/g	<0.0030	0.0030	4391662
g-Chlordane	ug/g	<0.0030	0.0030	4391662
o,p-DDD	ug/g	<0.0030	0.0030	4391662
p,p-DDD	ug/g	<0.0030	0.0030	4391662
o,p-DDE	ug/g	<0.0030	0.0030	4391662
p,p-DDE	ug/g	<0.0030	0.0030	4391662
o,p-DDT	ug/g	<0.0030	0.0030	4391662
p,p-DDT	ug/g	<0.0030	0.0030	4391662
Dieldrin	ug/g	<0.0030	0.0030	4391662
Lindane	ug/g	<0.0030	0.0030	4391662
Endosulfan I (alpha)	ug/g	<0.0030	0.0030	4391662
Endosulfan II (beta)	ug/g	<0.0030	0.0030	4391662
Endrin	ug/g	<0.0030	0.0030	4391662
Heptachlor	ug/g	<0.0030	0.0030	4391662
Heptachlor epoxide	ug/g	<0.0030	0.0030	4391662
Hexachlorobenzene	ug/g	<0.0030	0.0030	4391662
Hexachlorobutadiene	ug/g	<0.0075	0.0075	4391662
Hexachloroethane	ug/g	<0.0075	0.0075	4391662
Methoxychlor	ug/g	<0.0075	0.0075	4391662
Aroclor 1242	ug/g	<0.023	0.023	4391662
Aroclor 1248	ug/g	<0.023	0.023	4391662
Aroclor 1254	ug/g	<0.023	0.023	4391662
Aroclor 1260	ug/g	<0.023	0.023	4391662
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	85		4391662
Decachlorobiphenyl	%	132 (1)		4391662

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 PAHS (SOIL)

Maxxam ID		BWG382	BWG382	BWG386	BWG388	BWG389		
Sampling Date		2016/02/16 10:00	2016/02/16 10:00	2016/02/16 12:30	2016/02/16 14:00	2016/02/16 15:00		
COC Number		548176-04-01	548176-04-01	548176-04-01	548176-04-01	548176-04-01		
	UNITS	**BH16-10-1**	**BH16-10-1 Lab-Dup**	**BH16-13-1**	**BH16-5-1**	**BH16-5-2**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	31	30	32	6.0	39	0.2	4385962
Calculated Parameters								
Methylnaphthalene, 2-(1-)	ug/g	<0.014		<0.014	<0.014	<0.014	0.014	4385009
Polyaromatic Hydrocarbons								
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	0.013	<0.0050	0.0050	4385952
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4385952
Surrogate Recovery (%)								
D10-Anthracene	%	84	84	81	72	76		4385952
D14-Terphenyl (FS)	%	79	80	80	71	79		4385952
D8-Acenaphthylene	%	72	71	72	65	69		4385952

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BWG382	BWG382	BWG386	BWG388	BWG389		
Sampling Date		2016/02/16 10:00	2016/02/16 10:00	2016/02/16 12:30	2016/02/16 14:00	2016/02/16 15:00		
COC Number		548176-04-01	548176-04-01	548176-04-01	548176-04-01	548176-04-01		
	UNITS	**BH16-10-1**	**BH16-10-1 Lab-Dup**	**BH16-13-1**	**BH16-5-1**	**BH16-5-2**	**RDL**	**QC Batch**
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.50		<0.50	<0.50	<0.50	0.50	4386577
Benzene	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
Bromodichloromethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Bromoform	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Bromomethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Carbon Tetrachloride	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Chlorobenzene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Chloroform	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Dibromochloromethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,2-Dichlorobenzene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,3-Dichlorobenzene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,4-Dichlorobenzene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,1-Dichloroethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,2-Dichloroethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,1-Dichloroethylene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
cis-1,2-Dichloroethylene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
trans-1,2-Dichloroethylene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,2-Dichloropropane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
cis-1,3-Dichloropropene	ug/g	<0.030		<0.030	<0.030	<0.030	0.030	4386577
trans-1,3-Dichloropropene	ug/g	<0.040		<0.040	<0.040	<0.040	0.040	4386577
Ethylbenzene	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
Ethylene Dibromide	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Hexane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Methylene Chloride(Dichloromethane)	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50		<0.50	<0.50	<0.50	0.50	4386577
Methyl Isobutyl Ketone	ug/g	<0.50		<0.50	<0.50	<0.50	0.50	4386577
Methyl t-butyl ether (MTBE)	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Styrene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,1,1,2-Tetrachloroethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
1,1,2,2-Tetrachloroethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Tetrachloroethylene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Toluene	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
1,1,1-Trichloroethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		BWG382	BWG382	BWG386	BWG388	BWG389		
Sampling Date		2016/02/16 10:00	2016/02/16 10:00	2016/02/16 12:30	2016/02/16 14:00	2016/02/16 15:00		
COC Number		548176-04-01	548176-04-01	548176-04-01	548176-04-01	548176-04-01		
	UNITS	**BH16-10-1**	**BH16-10-1 Lab-Dup**	**BH16-13-1**	**BH16-5-1**	**BH16-5-2**	**RDL**	**QC Batch**
1,1,2-Trichloroethane	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Trichloroethylene	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Trichlorofluoromethane (FREON 11)	ug/g	<0.050		<0.050	<0.050	<0.050	0.050	4386577
Vinyl Chloride	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
p+m-Xylene	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
o-Xylene	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
Total Xylenes	ug/g	<0.020		<0.020	<0.020	<0.020	0.020	4386577
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/g	<10		<10	<10	<10	10	4388998
F1 (C6-C10) - BTEX	ug/g	<10		<10	<10	<10	10	4388998
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	4390130
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	4390130
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	4390130
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes		4390130
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	99		100	101	99		4388998
4-Bromofluorobenzene	%	101		101	101	100		4388998
D10-Ethylbenzene	%	83		101	83	91		4388998
D4-1,2-Dichloroethane	%	105		106	108	104		4388998
o-Terphenyl	%	90	90	90	91	90		4390130
4-Bromofluorobenzene	%	94		92	92	92		4386577
D10-o-Xylene	%	77		80	67	76		4386577
D4-1,2-Dichloroethane	%	98		99	100	100		4386577
D8-Toluene	%	95		94	95	95		4386577

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Lab-Dup = Laboratory Initiated Duplicate

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RESULTS OF ANALYSES OF SOIL

Maxxam ID		BWG384	BWG386	BWG388	BWG390		
Sampling Date		2016/02/16 11:00	2016/02/16 12:30	2016/02/16 14:00	2016/02/16		
COC Number		548176-04-01	548176-04-01	548176-04-01	548176-04-01		
	UNITS	**BH16-11-1**	**BH16-13-1**	**BH16-5-1**	**GRAIN SIZE**	**RDL**	**QC Batch**
Calculated Parameters							
Fraction of Organic Carbon	g/g	0.0024	0.012	0.011		0.0005	4385003
Fraction of Organic Carbon (rep.#1)	g/g	0.0025	0.0037	0.010		0.0005	4385003
Fraction of Organic Carbon (rep.#2)	g/g	0.0023	0.0041	0.012		0.0005	4385003
Average FOC Result	g/g	0.0024	0.0065	0.011		0.0005	4385003
Inorganics							
Total Organic Carbon	mg/kg	2400	12000	11000		500	4389161
Total Organic Carbon (repeat #1)	mg/kg	2500	3700	10000		500	4389161
Total Organic Carbon (repeat #2)	mg/kg	2300	4100	12000		500	4389161
Miscellaneous Parameters							
Grain Size	%				FINE	N/A	4388677
Sieve - #200 (<0.075mm)	%				96	1	4388677
Sieve - #200 (>0.075mm)	%				4	1	4388677

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

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VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID		BWG382	BWG386	BWG388	BWG389		
Sampling Date		2016/02/16 10:00	2016/02/16 12:30	2016/02/16 14:00	2016/02/16 15:00		
COC Number		548176-04-01	548176-04-01	548176-04-01	548176-04-01		
	UNITS	**BH16-10-1**	**BH16-13-1**	**BH16-5-1**	**BH16-5-2**	**RDL**	**QC Batch**
Calculated Parameters							
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	<0.050	0.050	4384908

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B632361
Report Date: 2016/03/08

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ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		BWG386		
Sampling Date		2016/02/16 12:30		
COC Number		548176-04-01		
	UNITS	**BH16-13-1**	**RDL**	**QC Batch**
Calculated Parameters				
Aldrin + Dieldrin	ug/g	<0.0030	0.0030	4385006
Chlordane (Total)	ug/g	<0.0030	0.0030	4385006
DDT+ Metabolites	ug/g	<0.0030	0.0030	4385006
Heptachlor + Heptachlor epoxide	ug/g	<0.0030	0.0030	4385006
o,p-DDD + p,p-DDD	ug/g	<0.0030	0.0030	4385006
o,p-DDE + p,p-DDE	ug/g	<0.0030	0.0030	4385006
o,p-DDT + p,p-DDT	ug/g	<0.0030	0.0030	4385006
Total Endosulfan	ug/g	<0.0030	0.0030	4385006
Total PCB	ug/g	<0.023	0.023	4385006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWG382
Sample ID: BH16-10-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4385009	N/A	2016/02/23	Paul Rubinato
Hot Water Extractable Boron	ICP	4408966	2016/03/08	2016/03/08	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4384908	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4407579	2016/03/07	2016/03/08	Xuanhong Qiu
Conductivity	AT	4407960	2016/03/08	2016/03/08	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4407716	2016/03/07	2016/03/08	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4388998	N/A	2016/02/22	Ravinder Gaidhu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4390130	2016/02/22	2016/02/23	Zhiyue (Frank) Zhu
Strong Acid Leachable Metals by ICPMS	ICP/MS	4407836	2016/03/07	2016/03/08	Viviana Canzonieri
MOISTURE	BAL	4385962	N/A	2016/02/19	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4385952	2016/02/18	2016/02/18	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4405601	2016/03/04	2016/03/04	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4401378	N/A	2016/03/08	Automated Statchk
SAR - ICP Metals	ICP	4407947	2016/03/08	2016/03/08	Suban Kanapathippllai
Volatile Organic Compounds in Soil	GC/MS	4386577	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWG382 Dup
Sample ID: BH16-10-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4390130	2016/02/22	2016/02/23	Zhiyue (Frank) Zhu
MOISTURE	BAL	4385962	N/A	2016/02/19	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4385952	2016/02/18	2016/02/18	Liliana Gaburici

Maxxam ID: BWG383
Sample ID: BH16-10-2
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
Moisture	BAL	4389919	N/A	2016/02/22	Valentina Kaftani
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli

Maxxam ID: BWG384
Sample ID: BH16-11-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai

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ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWG384
Sample ID: BH16-11-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Fraction Organic Carbon in Triplicate		4385003	N/A	2016/02/22	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
Moisture	BAL	4389919	N/A	2016/02/22	Valentina Kaftani
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli
Total Organic Carbon in Triplicate	COMB	4389161	N/A	2016/02/23	Birenkumar Patel

Maxxam ID: BWG385
Sample ID: BH16-11-2
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
Moisture	BAL	4389919	N/A	2016/02/22	Valentina Kaftani
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli

Maxxam ID: BWG386
Sample ID: BH16-13-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4385009	N/A	2016/02/23	Paul Rubinato
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4384908	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4388998	N/A	2016/02/22	Ravinder Gaidhu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4390130	2016/02/22	2016/02/23	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4385003	N/A	2016/02/22	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
MOISTURE	BAL	4385962	N/A	2016/02/19	Arezoo Habibagahi
OC Pesticides (Selected) & PCB	GC/ECD	4391662	2016/02/23	2016/02/25	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4385006	N/A	2016/02/19	Automated Statchk
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4385952	2016/02/18	2016/02/18	Liliana Gaburici

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Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWG386
Sample ID: BH16-13-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli
Total Organic Carbon in Triplicate	COMB	4389161	N/A	2016/02/23	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4386577	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWG387
Sample ID: BH16-13-2
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
Moisture	BAL	4389919	N/A	2016/02/22	Valentina Kaftani
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli

Maxxam ID: BWG388
Sample ID: BH16-5-1
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4385009	N/A	2016/02/23	Paul Rubinato
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4384908	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4388998	N/A	2016/02/22	Ravinder Gaidhu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4390130	2016/02/22	2016/02/23	Zhiyue (Frank) Zhu
Fraction Organic Carbon in Triplicate		4385003	N/A	2016/02/22	Automated Statchk
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
MOISTURE	BAL	4385962	N/A	2016/02/19	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4385952	2016/02/18	2016/02/18	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli
Total Organic Carbon in Triplicate	COMB	4389161	N/A	2016/02/23	Birenkumar Patel
Volatile Organic Compounds in Soil	GC/MS	4386577	N/A	2016/02/20	Anna Gabrielyan

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TEST SUMMARY

Maxxam ID: BWG389
Sample ID: BH16-5-2
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4385009	N/A	2016/02/23	Paul Rubinato
Hot Water Extractable Boron	ICP	4389622	2016/02/22	2016/02/22	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4384908	N/A	2016/02/22	Automated Statchk
Free (WAD) Cyanide	TECH	4388417	2016/02/19	2016/02/22	Xuanhong Qiu
Conductivity	AT	4390150	2016/02/23	2016/02/23	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4387971	2016/02/19	2016/02/23	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4388998	N/A	2016/02/22	Ravinder Gaidhu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4390130	2016/02/22	2016/02/23	Zhiyue (Frank) Zhu
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	4385843	2016/02/18	2016/02/19	Raigamage Perera
MOISTURE	BAL	4385962	N/A	2016/02/19	Arezoo Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4385952	2016/02/18	2016/02/18	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4387626	2016/02/19	2016/02/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4384191	N/A	2016/02/23	Automated Statchk
SAR - ICP Metals	ICP	4390133	2016/02/23	2016/02/23	Azita Fazaeli
Volatile Organic Compounds in Soil	GC/MS	4386577	N/A	2016/02/20	Anna Gabrielyan

Maxxam ID: BWG390
Sample ID: GRAIN SIZE
Matrix: Soil

Collected: 2016/02/16
Shipped:
Received: 2016/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sieve, 75um	SIEV	4388677	N/A	2016/02/22	Nimarta Singh

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Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
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Sampler Initials: CD

GENERAL COMMENTS

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

Package 1	0.7°C

Custody seal was present and intact on the cooler.

Revised Report (2016-03-09): Sample BH16-10-1 analyzed for Metals and Inorganics package as per client.

Sample BWG386-01 : OC Pesticide Analysis: Detection limits were adjusted for high moisture content.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B632361
Report Date: 2016/03/08

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4385952	D10-Anthracene	2016/02/18	80	50 - 130	84	50 - 130	88	%				
4385952	D14-Terphenyl (FS)	2016/02/18	74	50 - 130	75	50 - 130	79	%				
4385952	D8-Acenaphthylene	2016/02/18	69	50 - 130	74	50 - 130	75	%				
4386577	4-Bromofluorobenzene	2016/02/19	104	60 - 140	103	60 - 140	93	%				
4386577	D10-o-Xylene	2016/02/19	92	60 - 130	87	60 - 130	78	%				
4386577	D4-1,2-Dichloroethane	2016/02/19	94	60 - 140	100	60 - 140	105	%				
4386577	D8-Toluene	2016/02/19	102	60 - 140	105	60 - 140	93	%				
4388998	1,4-Difluorobenzene	2016/02/22	98	60 - 140	99	60 - 140	100	%				
4388998	4-Bromofluorobenzene	2016/02/22	101	60 - 140	101	60 - 140	103	%				
4388998	D10-Ethylbenzene	2016/02/22	95	60 - 140	85	60 - 140	95	%				
4388998	D4-1,2-Dichloroethane	2016/02/22	105	60 - 140	106	60 - 140	107	%				
4390130	o-Terphenyl	2016/02/23	93	60 - 130	96	60 - 130	94	%				
4391662	2,4,5,6-Tetrachloro-m-xylene	2016/02/25	80	50 - 130	88	50 - 130	81	%				
4391662	Decachlorobiphenyl	2016/02/25	114	50 - 130	129	50 - 130	110	%				
4385843	Acid Extractable Antimony (Sb)	2016/02/19	105	75 - 125	104	80 - 120	<0.2	ug/g	NC	35		
4385843	Acid Extractable Arsenic (As)	2016/02/19	108	75 - 125	107	80 - 120	<1	ug/g	NC	35		
4385843	Acid Extractable Barium (Ba)	2016/02/19	NC	75 - 125	104	80 - 120	<0.5	ug/g	9.9	35		
4385843	Acid Extractable Beryllium (Be)	2016/02/19	105	75 - 125	107	80 - 120	<0.2	ug/g	NC	35		
4385843	Acid Extractable Boron (B)	2016/02/19	108	75 - 125	110	80 - 120	<5	ug/g	NC	35		
4385843	Acid Extractable Cadmium (Cd)	2016/02/19	105	75 - 125	105	80 - 120	<0.1	ug/g	NC	35		
4385843	Acid Extractable Chromium (Cr)	2016/02/19	NC	75 - 125	108	80 - 120	<1	ug/g	9.3	35		
4385843	Acid Extractable Cobalt (Co)	2016/02/19	103	75 - 125	110	80 - 120	<0.1	ug/g	13	35		
4385843	Acid Extractable Copper (Cu)	2016/02/19	99	75 - 125	107	80 - 120	<0.5	ug/g	4.8	35		
4385843	Acid Extractable Lead (Pb)	2016/02/19	101	75 - 125	105	80 - 120	<1	ug/g	5.6	35		
4385843	Acid Extractable Mercury (Hg)	2016/02/19	99	75 - 125	101	80 - 120	<0.05	ug/g	NC	35		
4385843	Acid Extractable Molybdenum (Mo)	2016/02/19	109	75 - 125	106	80 - 120	<0.5	ug/g	NC	35		
4385843	Acid Extractable Nickel (Ni)	2016/02/19	105	75 - 125	109	80 - 120	<0.5	ug/g	1.8	35		
4385843	Acid Extractable Selenium (Se)	2016/02/19	107	75 - 125	106	80 - 120	<0.5	ug/g	NC	35		
4385843	Acid Extractable Silver (Ag)	2016/02/19	106	75 - 125	105	80 - 120	<0.2	ug/g	NC	35		
4385843	Acid Extractable Thallium (Tl)	2016/02/19	104	75 - 125	104	80 - 120	<0.05	ug/g	NC	35		
4385843	Acid Extractable Uranium (U)	2016/02/19	109	75 - 125	107	80 - 120	<0.05	ug/g	8.1	25		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4385843	Acid Extractable Vanadium (V)	2016/02/19	NC	75 - 125	110	80 - 120	<5	ug/g	NC	35		
4385843	Acid Extractable Zinc (Zn)	2016/02/19	NC	75 - 125	107	80 - 120	<5	ug/g	1.2	35		
4385952	1-Methylnaphthalene	2016/02/18	70	50 - 130	71	50 - 130	<0.0050	ug/g	NC	40		
4385952	2-Methylnaphthalene	2016/02/18	69	50 - 130	70	50 - 130	<0.0050	ug/g	NC	40		
4385952	Acenaphthene	2016/02/18	66	50 - 130	68	50 - 130	<0.0050	ug/g	NC	40		
4385952	Acenaphthylene	2016/02/18	59	50 - 130	62	50 - 130	<0.0050	ug/g	NC	40		
4385952	Anthracene	2016/02/18	68	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4385952	Benzo(a)anthracene	2016/02/18	71	50 - 130	72	50 - 130	<0.0050	ug/g	NC	40		
4385952	Benzo(a)pyrene	2016/02/18	72	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40		
4385952	Benzo(b/j)fluoranthene	2016/02/18	77	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40		
4385952	Benzo(g,h,i)perylene	2016/02/18	73	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40		
4385952	Benzo(k)fluoranthene	2016/02/18	70	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40		
4385952	Chrysene	2016/02/18	68	50 - 130	71	50 - 130	<0.0050	ug/g	NC	40		
4385952	Dibenz(a,h)anthracene	2016/02/18	73	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40		
4385952	Fluoranthene	2016/02/18	67	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4385952	Fluorene	2016/02/18	67	50 - 130	70	50 - 130	<0.0050	ug/g	NC	40		
4385952	Indeno(1,2,3-cd)pyrene	2016/02/18	77	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40		
4385952	Naphthalene	2016/02/18	67	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4385952	Phenanthrene	2016/02/18	66	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4385952	Pyrene	2016/02/18	66	50 - 130	67	50 - 130	<0.0050	ug/g	NC	40		
4385962	Moisture	2016/02/19							3.6	50		
4386577	1,1,1,2-Tetrachloroethane	2016/02/19	88	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4386577	1,1,1-Trichloroethane	2016/02/19	86	60 - 140	86	60 - 130	<0.050	ug/g	NC	50		
4386577	1,1,2,2-Tetrachloroethane	2016/02/19	87	60 - 140	93	60 - 130	<0.050	ug/g	NC	50		
4386577	1,1,2-Trichloroethane	2016/02/19	84	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4386577	1,1-Dichloroethane	2016/02/19	86	60 - 140	86	60 - 130	<0.050	ug/g	NC	50		
4386577	1,1-Dichloroethylene	2016/02/19	90	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4386577	1,2-Dichlorobenzene	2016/02/19	91	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4386577	1,2-Dichloroethane	2016/02/19	87	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4386577	1,2-Dichloropropane	2016/02/19	87	60 - 140	87	60 - 130	<0.050	ug/g	NC	50		
4386577	1,3-Dichlorobenzene	2016/02/19	94	60 - 140	87	60 - 130	<0.050	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4386577	1,4-Dichlorobenzene	2016/02/19	97	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4386577	Acetone (2-Propanone)	2016/02/19	82	60 - 140	91	60 - 140	<0.50	ug/g	NC	50		
4386577	Benzene	2016/02/19	87	60 - 140	86	60 - 130	<0.020	ug/g	NC	50		
4386577	Bromodichloromethane	2016/02/19	88	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4386577	Bromoform	2016/02/19	84	60 - 140	91	60 - 130	<0.050	ug/g	NC	50		
4386577	Bromomethane	2016/02/19	76	60 - 140	78	60 - 140	<0.050	ug/g	NC	50		
4386577	Carbon Tetrachloride	2016/02/19	89	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4386577	Chlorobenzene	2016/02/19	92	60 - 140	90	60 - 130	<0.050	ug/g	NC	50		
4386577	Chloroform	2016/02/19	86	60 - 140	88	60 - 130	<0.050	ug/g	NC	50		
4386577	cis-1,2-Dichloroethylene	2016/02/19	88	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4386577	cis-1,3-Dichloropropene	2016/02/19	87	60 - 140	90	60 - 130	<0.030	ug/g	NC	50		
4386577	Dibromochloromethane	2016/02/19	86	60 - 140	91	60 - 130	<0.050	ug/g	NC	50		
4386577	Dichlorodifluoromethane (FREON 12)	2016/02/19	88	60 - 140	83	60 - 140	<0.050	ug/g	NC	50		
4386577	Ethylbenzene	2016/02/19	99	60 - 140	90	60 - 130	<0.020	ug/g	NC	50		
4386577	Ethylene Dibromide	2016/02/19	86	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4386577	Hexane	2016/02/19	96	60 - 140	93	60 - 130	<0.050	ug/g	NC	50		
4386577	Methyl Ethyl Ketone (2-Butanone)	2016/02/19	89	60 - 140	98	60 - 140	<0.50	ug/g	NC	50		
4386577	Methyl Isobutyl Ketone	2016/02/19	91	60 - 140	98	60 - 130	<0.50	ug/g	NC	50		
4386577	Methyl t-butyl ether (MTBE)	2016/02/19	87	60 - 140	89	60 - 130	<0.050	ug/g	NC	50		
4386577	Methylene Chloride(Dichloromethane)	2016/02/19	93	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4386577	o-Xylene	2016/02/19	99	60 - 140	93	60 - 130	<0.020	ug/g	NC	50		
4386577	p+m-Xylene	2016/02/19	99	60 - 140	92	60 - 130	<0.020	ug/g	NC	50		
4386577	Styrene	2016/02/19	99	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4386577	Tetrachloroethylene	2016/02/19	88	60 - 140	87	60 - 130	<0.050	ug/g	NC	50		
4386577	Toluene	2016/02/19	89	60 - 140	90	60 - 130	<0.020	ug/g	NC	50		
4386577	Total Xylenes	2016/02/19					<0.020	ug/g	NC	50		
4386577	trans-1,2-Dichloroethylene	2016/02/19	84	60 - 140	83	60 - 130	<0.050	ug/g	NC	50		
4386577	trans-1,3-Dichloropropene	2016/02/19	82	60 - 140	91	60 - 130	<0.040	ug/g	NC	50		
4386577	Trichloroethylene	2016/02/19	87	60 - 140	85	60 - 130	<0.050	ug/g	NC	50		
4386577	Trichlorofluoromethane (FREON 11)	2016/02/19	89	60 - 140	87	60 - 130	<0.050	ug/g	NC	50		
4386577	Vinyl Chloride	2016/02/19	88	60 - 140	84	60 - 130	<0.020	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4387626	Available (CaCl2) pH	2016/02/19			98	97 - 103			0.32	N/A		
4387971	Chromium (VI)	2016/02/23	99	75 - 125	99	80 - 120	<0.2	ug/g	NC	35	84	75 - 125
4388417	Free Cyanide	2016/02/22	106	75 - 125	104	80 - 120	<0.01	ug/g	NC	35		
4388677	Sieve - #200 (<0.075mm)	2016/02/22							0.35	20	89	88 - 91
4388677	Sieve - #200 (>0.075mm)	2016/02/22							1.5	20	11	9 - 12
4388998	F1 (C6-C10) - BTEX	2016/02/22					<10	ug/g	NC	30		
4388998	F1 (C6-C10)	2016/02/22	77	60 - 140	82	80 - 120	<10	ug/g	NC	30		
4389161	Total Organic Carbon (repeat #1)	2016/02/23					N/A***, RDL=500	mg/kg				
4389161	Total Organic Carbon (repeat #2)	2016/02/23					N/A***, RDL=500	mg/kg				
4389161	Total Organic Carbon	2016/02/23					<500	mg/kg			112	75 - 125
4389622	Hot Water Ext. Boron (B)	2016/02/22	107	75 - 125	103	75 - 125	<0.050	ug/g	NC	40		
4389919	Moisture	2016/02/22							1.7	20		
4390130	F2 (C10-C16 Hydrocarbons)	2016/02/23	90	50 - 130	94	80 - 120	<10	ug/g	NC	30		
4390130	F3 (C16-C34 Hydrocarbons)	2016/02/23	94	50 - 130	97	80 - 120	<50	ug/g	NC	30		
4390130	F4 (C34-C50 Hydrocarbons)	2016/02/23	91	50 - 130	92	80 - 120	<50	ug/g	NC	30		
4390133	Soluble Calcium (Ca)	2016/02/23			103	80 - 120	<0.5	mg/L	0.095	30		
4390133	Soluble Magnesium (Mg)	2016/02/23			99	80 - 120	<0.5	mg/L	2.5	30		
4390133	Soluble Sodium (Na)	2016/02/23			106	80 - 120	<5	mg/L	0.34	30		
4390150	Conductivity	2016/02/23			100	90 - 110	<0.002	mS/cm	1.0	10		
4391662	a-Chlordane	2016/02/25	106	50 - 130	107	50 - 130	<0.0020	ug/g	NC	40		
4391662	Aldrin	2016/02/25	88	50 - 130	88	50 - 130	<0.0020	ug/g	NC	40		
4391662	Aroclor 1242	2016/02/25					<0.015	ug/g	NC	40		
4391662	Aroclor 1248	2016/02/25					<0.015	ug/g	NC	40		
4391662	Aroclor 1254	2016/02/25					<0.015	ug/g	NC	40		
4391662	Aroclor 1260	2016/02/25					<0.015	ug/g	NC	40		
4391662	Dieldrin	2016/02/25	108	50 - 130	112	50 - 130	<0.0020	ug/g	NC	40		
4391662	Endosulfan I (alpha)	2016/02/25	93	50 - 130	95	50 - 130	<0.0020	ug/g	NC	40		
4391662	Endosulfan II (beta)	2016/02/25	14 (1)	50 - 130	14 (1)	50 - 130	<0.0020	ug/g	NC	40		
4391662	Endrin	2016/02/25	91	50 - 130	101	50 - 130	<0.0020	ug/g	NC	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4391662	g-Chlordane	2016/02/25	110	50 - 130	108	50 - 130	<0.0020	ug/g	NC	40		
4391662	Heptachlor epoxide	2016/02/25	105	50 - 130	106	50 - 130	<0.0020	ug/g	NC	40		
4391662	Heptachlor	2016/02/25	48 (2)	50 - 130	54	50 - 130	<0.0020	ug/g	NC	40		
4391662	Hexachlorobenzene	2016/02/25	84	50 - 130	89	50 - 130	<0.0020	ug/g	NC	40		
4391662	Hexachlorobutadiene	2016/02/25	72	50 - 130	93	50 - 130	<0.0050	ug/g	NC	40		
4391662	Hexachloroethane	2016/02/25	53	50 - 130	76	50 - 130	<0.0050	ug/g	NC	40		
4391662	Lindane	2016/02/25	92	50 - 130	95	50 - 130	<0.0020	ug/g	NC	40		
4391662	Methoxychlor	2016/02/25	116	50 - 130	134 (3)	50 - 130	<0.0050	ug/g	NC	40		
4391662	o,p-DDD	2016/02/25	126	50 - 130	134 (3)	50 - 130	<0.0020	ug/g	NC	40		
4391662	o,p-DDE	2016/02/25	108	50 - 130	112	50 - 130	<0.0020	ug/g	NC	40		
4391662	o,p-DDT	2016/02/25	118	50 - 130	126	50 - 130	<0.0020	ug/g	NC	40		
4391662	p,p-DDD	2016/02/25	120	50 - 130	127	50 - 130	<0.0020	ug/g	NC	40		
4391662	p,p-DDE	2016/02/25	107	50 - 130	108	50 - 130	<0.0020	ug/g	NC	40		
4391662	p,p-DDT	2016/02/25	123	50 - 130	131 (3)	50 - 130	<0.0020	ug/g	NC	40		
4405601	Available (CaCl2) pH	2016/03/04			98	97 - 103			0.78	N/A		
4407579	Free Cyanide	2016/03/08	95	75 - 125	96	80 - 120	<0.01	ug/g	NC	35		
4407716	Chromium (VI)	2016/03/08	61 (4)	75 - 125	99	80 - 120	<0.2	ug/g	NC	35	81	75 - 125
4407836	Acid Extractable Antimony (Sb)	2016/03/08	97	75 - 125	105	80 - 120	<0.20	ug/g				
4407836	Acid Extractable Arsenic (As)	2016/03/08	95	75 - 125	103	80 - 120	<1.0	ug/g	NC	30		
4407836	Acid Extractable Barium (Ba)	2016/03/08	NC	75 - 125	108	80 - 120	<0.50	ug/g				
4407836	Acid Extractable Beryllium (Be)	2016/03/08	95	75 - 125	97	80 - 120	<0.20	ug/g				
4407836	Acid Extractable Boron (B)	2016/03/08	91	75 - 125	99	80 - 120	<5.0	ug/g				
4407836	Acid Extractable Cadmium (Cd)	2016/03/08	104	75 - 125	104	80 - 120	<0.10	ug/g				
4407836	Acid Extractable Chromium (Cr)	2016/03/08	NC	75 - 125	101	80 - 120	<1.0	ug/g				
4407836	Acid Extractable Cobalt (Co)	2016/03/08	99	75 - 125	98	80 - 120	<0.10	ug/g				
4407836	Acid Extractable Copper (Cu)	2016/03/08	NC	75 - 125	102	80 - 120	<0.50	ug/g				
4407836	Acid Extractable Lead (Pb)	2016/03/08	NC	75 - 125	103	80 - 120	<1.0	ug/g				
4407836	Acid Extractable Mercury (Hg)	2016/03/08	106	75 - 125	106	80 - 120	<0.050	ug/g				
4407836	Acid Extractable Molybdenum (Mo)	2016/03/08	104	75 - 125	105	80 - 120	<0.50	ug/g				
4407836	Acid Extractable Nickel (Ni)	2016/03/08	97	75 - 125	101	80 - 120	<0.50	ug/g				
4407836	Acid Extractable Selenium (Se)	2016/03/08	100	75 - 125	100	80 - 120	<0.50	ug/g				

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4407836	Acid Extractable Silver (Ag)	2016/03/08	102	75 - 125	101	80 - 120	<0.20	ug/g				
4407836	Acid Extractable Thallium (Tl)	2016/03/08	100	75 - 125	102	80 - 120	<0.050	ug/g				
4407836	Acid Extractable Uranium (U)	2016/03/08	100	75 - 125	102	80 - 120	<0.050	ug/g	5.1	30		
4407836	Acid Extractable Vanadium (V)	2016/03/08	NC	75 - 125	99	80 - 120	<5.0	ug/g				
4407836	Acid Extractable Zinc (Zn)	2016/03/08	NC	75 - 125	102	80 - 120	<5.0	ug/g				
4407947	Soluble Calcium (Ca)	2016/03/08			104	80 - 120	<0.5	mg/L	4.5	30		
4407947	Soluble Magnesium (Mg)	2016/03/08			101	80 - 120	<0.5	mg/L	NC	30		
4407947	Soluble Sodium (Na)	2016/03/08			103	80 - 120	<5	mg/L	NC	30		
4407960	Conductivity	2016/03/08			100	90 - 110	<0.002	mS/cm	0.45	10		
4408966	Hot Water Ext. Boron (B)	2016/03/08	107	75 - 125	104	75 - 125	<0.050	ug/g	NC	40		

N/A = Not Applicable

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

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

(2) The recovery for the flagged target analyte was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported for this specific analyte with spike recoveries within this range are still valid but may have an associated low bias.

(3) The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte. For results that were not detected (ND), this potential bias has no impact.

(4) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The sample was reanalyzed with the same results.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B632361
Report Date: 2016/03/08

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Scientific Services

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Paul Rubinato, Analyst, Maxxam Analytics

Steve Roberts, Ottawa Lab Manager

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

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Maxxam
A Bureau Veritas Group Company

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B60807	Maxxam Job #:	Bottle Order #:
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			548176
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Project Name:		C#548176-04-01	Parnian Baber
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	C.D		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☒ For RSC; ☒ Table 5

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558 ☐ Storm Sewer Bylaw; ☐ MISA Municipality ____; ☐ PWQO; ☐ Other ____

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs & F1-F4 (Soil)	O.Reg 153 OC Pesticides (Soil)	O.Reg 153 Metals & Inorganics Pkg (Wtr)	O.Reg 153 PAHs (Water)	O.Reg 153 VOCs & F1-F4 (Water)	O.Reg 153 OC Pesticides (Water)	FOC (soil)	Grain Size (soil)	# of Bottles	Comments
1		BH16-10-1	16/02/16	10 AM	Soil	N/A		X	X								1 bag 2 jars	3 vials
2		BH16-10-2	16/02/16	10:30AM	Soil	N/A	X										1 bag	
3		BH16-11-1	16/02/16	11AM	Soil	N/A	X								X		1 bag 1 jar	
4		BH16-11-2	16/02/16	11:30AM	Soil	N/A	X										~~1 jar~~ 1 bag	
5		BH16-13-1	16/02/16	12:30Pm	Soil	N/A	X	X	X	X					X		4 jars 1 bag	3 vials
6		BH16-13-2	16/02/16	1Pm	Soil	N/A	X										1 bag	
7		BH16-5-1	16/02/16	2Pm	Soil	N/A	X	X	X						X		3 jars 1 bag	3 vials
8		BH16-5-2	16/02/16	3Pm	Soil	N/A	X	X	X								1 bag 2 jars	3 vials
9		Grain Size	16/02/16	N/A	Soil	N/A										X	2 bags	
10																		

FHB B632361 OTT-002 Parnian Baber 17-Feb-16 13:50

RECEIVED IN OTTAWA ON ICE

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
CHRIS DAVIS	16/02/16	8pm	Fatemeh	2016/02/17	13:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	3, 1, 0	Present	✓	
		Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

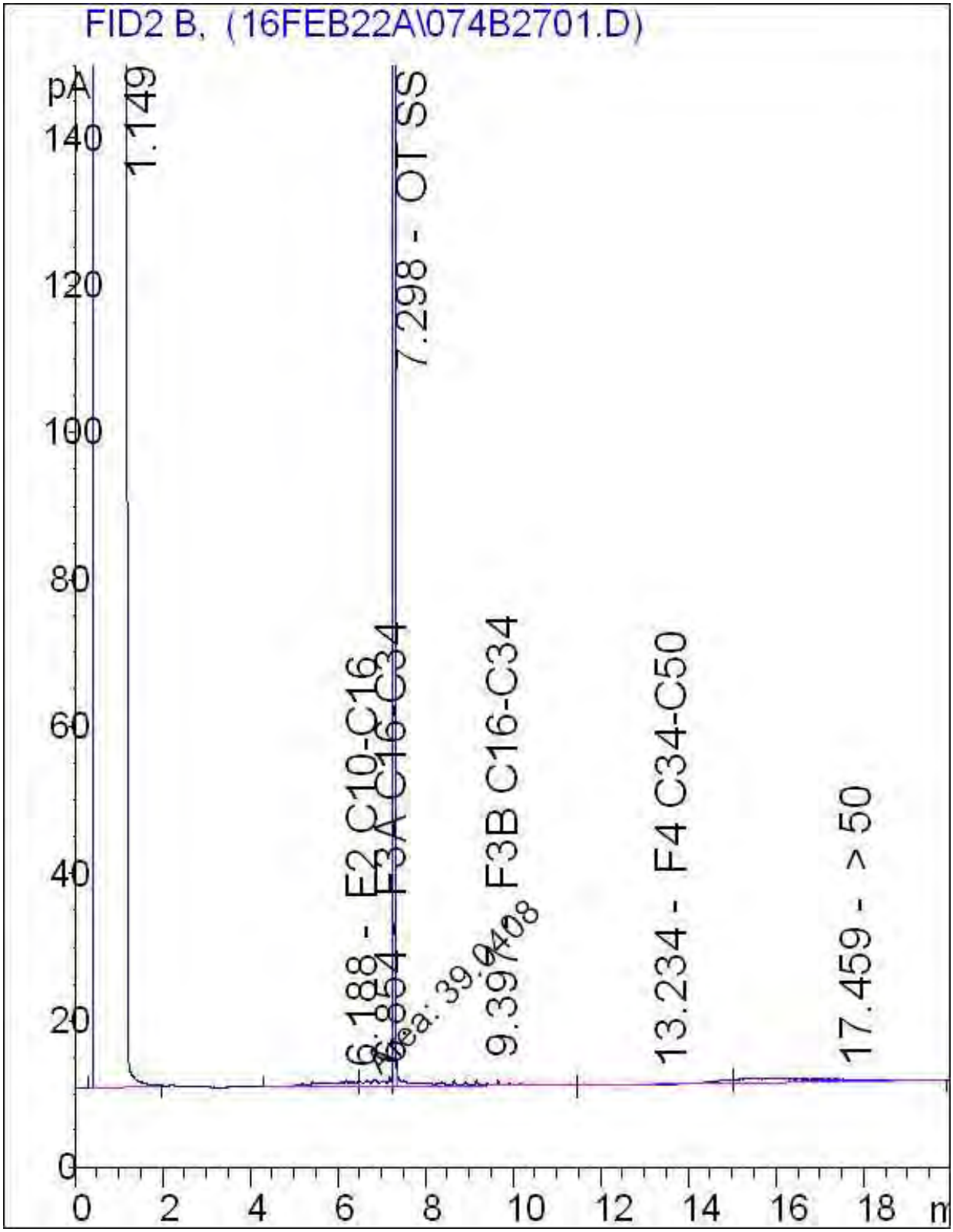
White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B632361
Report Date: 2016/03/08
Maxxam Sample: BWG382

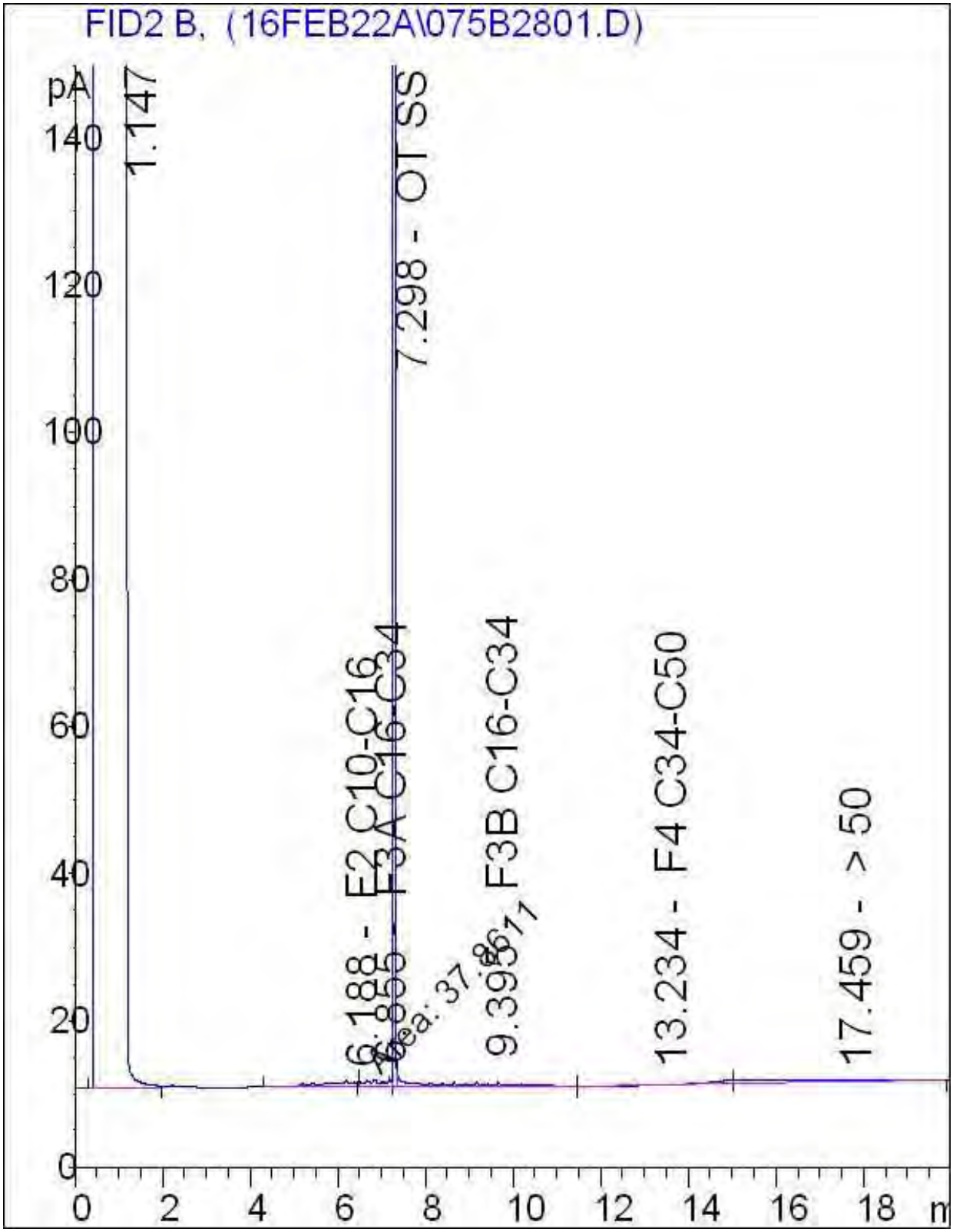
ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-10-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

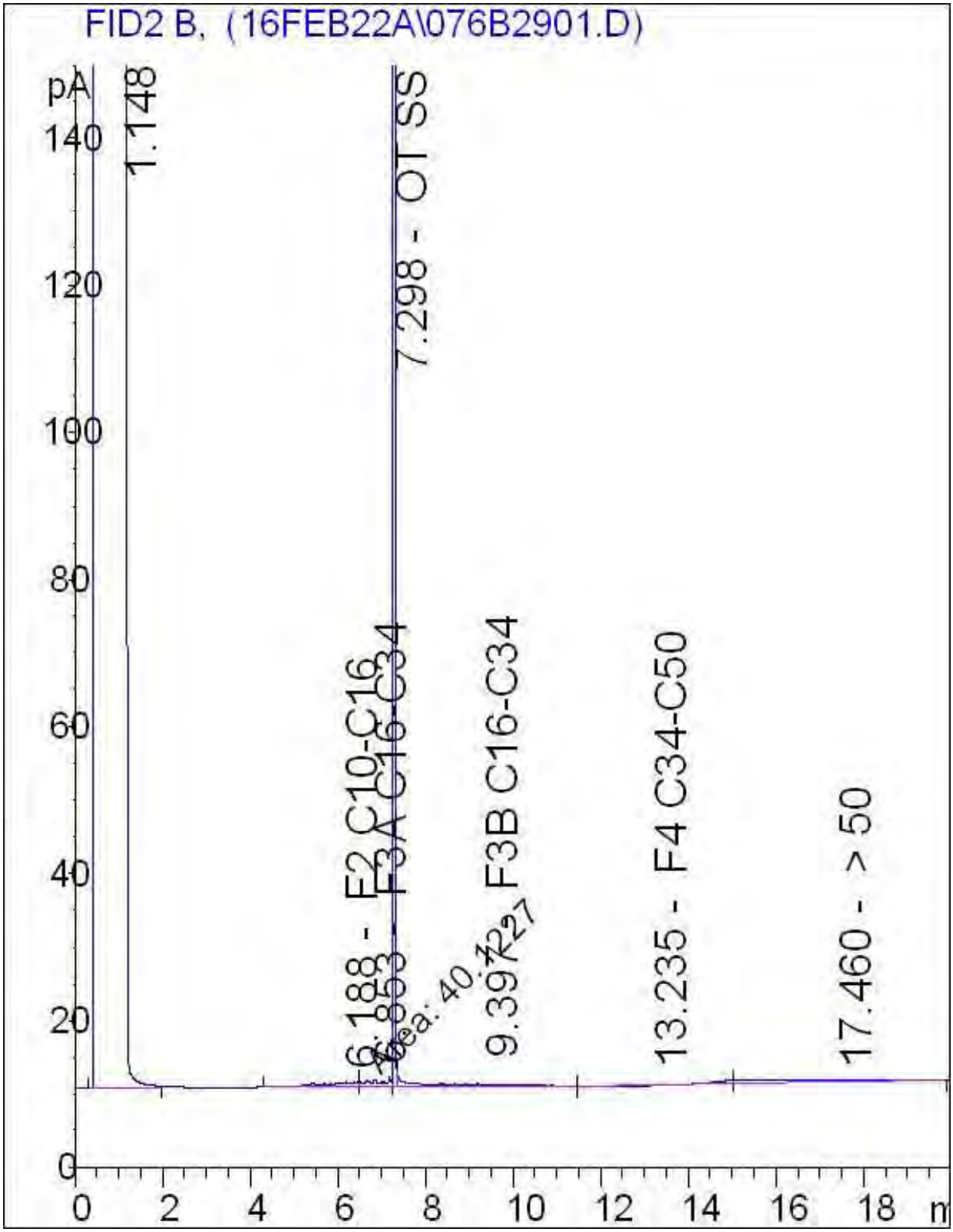


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B632361
Report Date: 2016/03/08
Maxxam Sample: BWG386

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-13-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

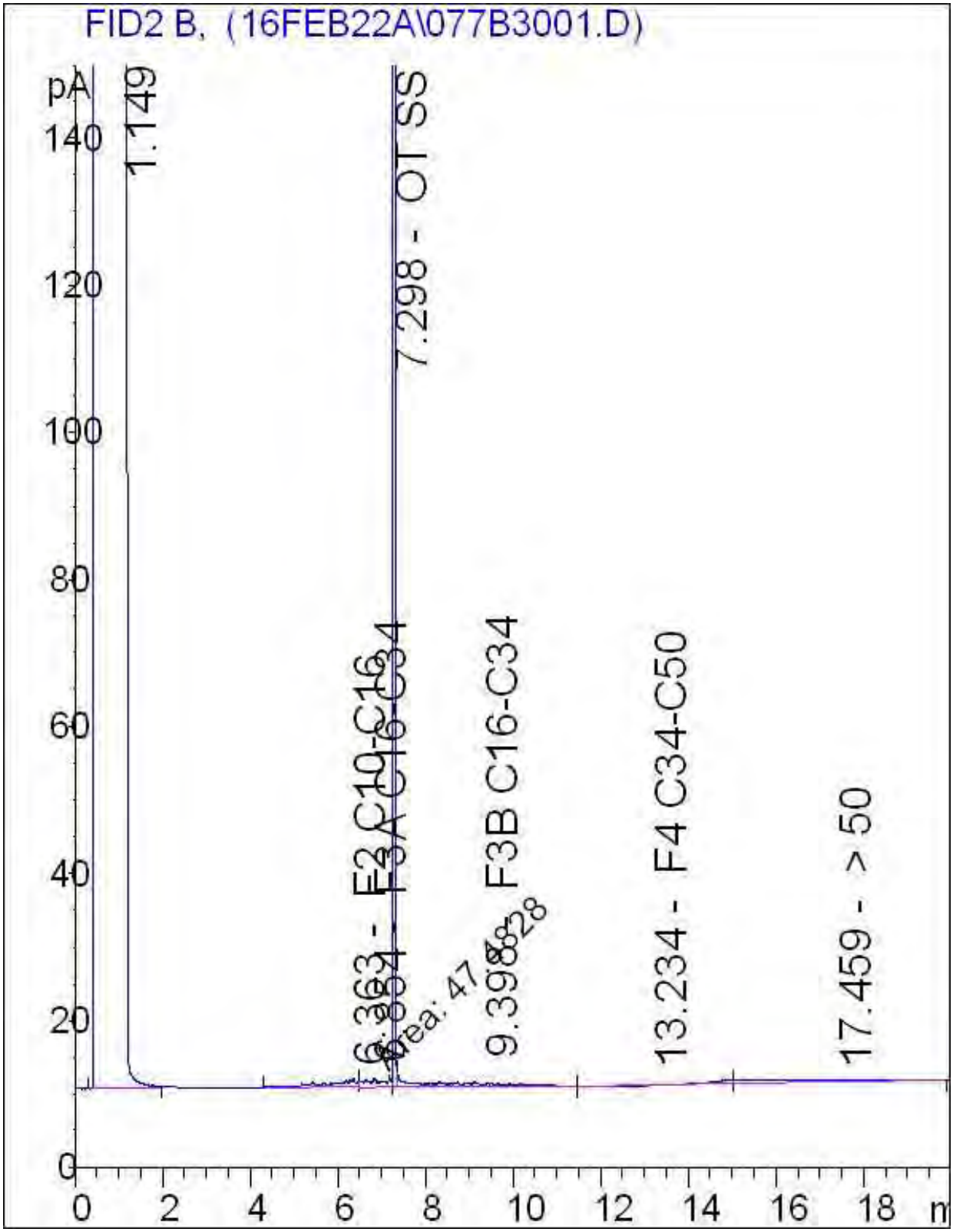


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B632361
Report Date: 2016/03/08
Maxxam Sample: BWG388

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-5-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

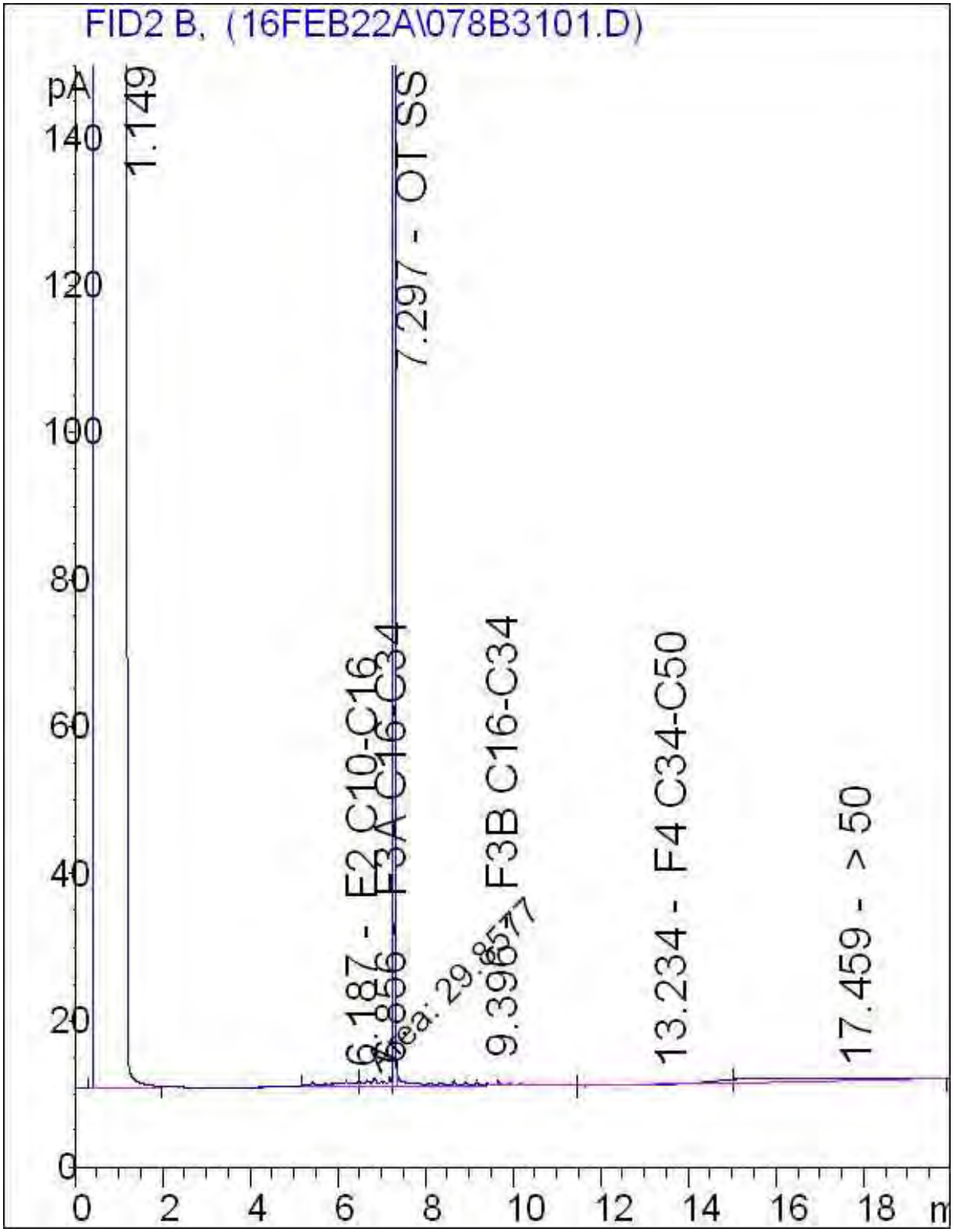


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B632361
Report Date: 2016/03/08
Maxxam Sample: BWG389

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: BH16-5-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Your Project #: 450271-000
Your C.O.C. #: 551696-01-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/03/11
Report #: R3925495
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B646940
Received: 2016/03/08, 14:55

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Phenols (4AAP) (1)	3	N/A	2016/03/10	CAM SOP-00444	OMOE E3179 m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B646940
Report Date: 2016/03/11

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

RESULTS OF ANALYSES OF WATER

Maxxam ID		BZF769	BZF770	BZF771		
Sampling Date		2016/03/08 10:30	2016/03/08 10:30	2016/03/08 10:30		
COC Number		551696-01-01	551696-01-01	551696-01-01		
	UNITS	**MW16-5**	**DUP-1**	**FIELD BLANK**	**RDL**	**QC Batch**
Inorganics						
Phenols-4AAP	mg/L	<0.0010	<0.0010	<0.0010	0.0010	4411541

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B646940
Report Date: 2016/03/11

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BZF769
Sample ID: MW16-5
Matrix: Water

Collected: 2016/03/08
Shipped:
Received: 2016/03/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	4411541	N/A	2016/03/10	Faye Sabet

Maxxam ID: BZF770
Sample ID: DUP-1
Matrix: Water

Collected: 2016/03/08
Shipped:
Received: 2016/03/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	4411541	N/A	2016/03/10	Faye Sabet

Maxxam ID: BZF771
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2016/03/08
Shipped:
Received: 2016/03/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	4411541	N/A	2016/03/10	Faye Sabet

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B646940
Report Date: 2016/03/11

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

GENERAL COMMENTS

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

Package 1	8.0°C

Custody seal was present and intact on the cooler.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B646940
Report Date: 2016/03/11

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4411541	Phenols-4AAP	2016/03/10	84	80 - 120	100	85 - 115	<0.0010	mg/L	NC	20

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B646940
Report Date: 2016/03/11

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Services

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B60807	Maxxam Job #:	Bottle Order #: 551696
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #: C#551696-01-01	Project Manager: Parnian Baber
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Project Name:			
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	CD		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☒ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 5	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality _____ ☐ PWQO ☐ Other _____	

Include Criteria on Certificate of Analysis (Y/N)? _____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Phenols (4AAP)									# of Bottles	Comments
1		MW16-5	2016/03/08	10:30 AM	GW	No	X									1	
2		DUP-1	2016/03/08	10:30 AM	GW	No	X									1	
3		Field Blank	2016/03/08	10:30 AM	W	No	X									1	
4																	
5																	
6																	
7																	
8																	RECEIVED IN OTTAWA
9																	ON ICE
10																	

8-Mar-16 14:5
Parnian Baber
B646940
FHB OTT-00

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
Chris DAVIS	16/03/08	2:55pm	HA Tatemeh	2016/03/08	14:55			9, 8, 7	Present		
									Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: MB697905
Site Location: 450271000

Attention:SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2016/05/25
Report #: R2185733
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B637938
Received: 2016/05/17, 08:38

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Texture by Hydrometer	3	N/A	2016/05/19	AB SOP-00035 / AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	3	N/A	2016/05/19	AB SOP-00030	Auto Calc

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Joyce Kimani, Project Manager Assistant
Email: JKimani@maxxam.ca
Phone# (403)735-2287
==========
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		OQ4621	OQ4622	OQ4623		
Sampling Date		2016/05/12 11:00	2016/05/12 11:30	2016/05/12 13:15		
	UNITS	**G.S-1 (CIZ110-01)**	**G.S-2 (CIZ116-01)**	**G.S-3 (CIZ124-01)**	**RDL**	**QC Batch**
Physical Properties						
% sand by hydrometer	%	7.6	27	12	2.0	8274110
% silt by hydrometer	%	16	22	17	2.0	8274110
Clay Content	%	76	51	71	2.0	8274110
Texture	N/A	HEAVY CLAY	CLAY	HEAVY CLAY	N/A	8271873

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: OQ4621
Sample ID: G.S-1 (CIZ110-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam ID: OQ4622
Sample ID: G.S-2 (CIZ116-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam ID: OQ4623
Sample ID: G.S-3 (CIZ124-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

GENERAL COMMENTS

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

Package 1	0.7°C

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

QUALITY ASSURANCE REPORT

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

			RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
8274110	% sand by hydrometer	2016/05/19	NC	35	104	93 - 107
8274110	% silt by hydrometer	2016/05/19	1.0	35	92	90 - 110
8274110	Clay Content	2016/05/19	1.4	35	103	86 - 114

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

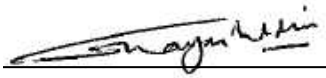
Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

VALIDATION SIGNATURE PAGE

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



Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

MAXXAM ANALYTICS
6740 Campobello Road
Mississauga, Ontario, L5N 2L8
(905) 817-5700
(905) 817-5777

541

ARCADIS Canada Inc - Ottawa
Maxxam PM Parnian Baber

SUBCONTRACTING REQUEST FORM

To: Campo to Calgary Subcontract

Job# B697905

☐ Yes ☒ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Sample ID	Matrix	Test(s) Required	Container	Date Sampled	Date Required
CIZ110-01R\G.S.-1	S	Soil Texture (% sand, %silt, %clay)	1-INOT	2016/05/12 11:00	2016/05/25
CIZ116-01R\G.S.-2	S	Soil Texture (% sand, %silt, %clay)	1-INOT	2016/05/12 11:30	2016/05/25
CIZ124-01R\G.S.-3	S	Soil Texture (% sand, %silt, %clay)	1-INOT	2016/05/12 13:15	2016/05/25

	Temp. 1	Temp. 2	Temp. 3			
Cooler #1	1	1	0	Custody Seal Present	~~YES~~ ✓	NO
				Custody Seal Intact	~~YES~~ ✓	NO
				Ice Present Upon Receipt	~~YES~~ ✓	NO
Cooler #2				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #3				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO

Receiving Maxxam Location: Campo to Calgary Subcontract JOB # _____

Relinquished by (Sign) _____ (print) MUSROP NOR Date and Time 2016/05/16 14:30

Received by (Sign) _____ (print) WINDCHONG (ZW) Date and Time 2016/05/17 08:35

NOTES:

1) Please call us if due date cannot be met. Please reference Sample ID on your report.
2) Include copy of this completed form, Client COC & signed final report to **scontractor@maxxamanalytics.com**

Reporting Requirements:

National:

Regional:

B637938_COC

17-May-16 08:38
Joyce Kimani
B637938

JKU INS-0114

Shipping Instructions

☐ Ship Immediately (highlight Yellow)
☐ Requires 9am
☐ Requires Sat. Delivery
☐ Regular Ship next available day
☐ Ship Cold
☐ Ship Room Temp
☐ Ship Frozen
☐ COC Must be Attached

Sender (Print) _____ Initial _____

Shipping Department Checklist

☐ Correct Shipping location
☐ Correct Sample Ids (Paperwork vs Bottles)
☐ Yes ☐ No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____ Number of coolers _____
Shipper (Print) _____ Initial _____

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: MB697905
Site Location: 450271000

Attention:SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2016/05/25
Report #: R2185733
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B637938
Received: 2016/05/17, 08:38

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Texture by Hydrometer	3	N/A	2016/05/19	AB SOP-00035 / AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	3	N/A	2016/05/19	AB SOP-00030	Auto Calc

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Joyce Kimani, Project Manager Assistant
Email: JKimani@maxxam.ca
Phone# (403)735-2287
==========
This report has been generated and distributed using a secure automated process.
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		OQ4621	OQ4622	OQ4623		
Sampling Date		2016/05/12 11:00	2016/05/12 11:30	2016/05/12 13:15		
	UNITS	**G.S-1 (CIZ110-01)**	**G.S-2 (CIZ116-01)**	**G.S-3 (CIZ124-01)**	**RDL**	**QC Batch**
Physical Properties						
% sand by hydrometer	%	7.6	27	12	2.0	8274110
% silt by hydrometer	%	16	22	17	2.0	8274110
Clay Content	%	76	51	71	2.0	8274110
Texture	N/A	HEAVY CLAY	CLAY	HEAVY CLAY	N/A	8271873

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: OQ4621
Sample ID: G.S-1 (CIZ110-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam ID: OQ4622
Sample ID: G.S-2 (CIZ116-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam ID: OQ4623
Sample ID: G.S-3 (CIZ124-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

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Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

GENERAL COMMENTS

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

Package 1	0.7°C

Results relate only to the items tested.

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Maxxam Job #: B637938
Report Date: 2016/05/25

QUALITY ASSURANCE REPORT

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

			RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
8274110	% sand by hydrometer	2016/05/19	NC	35	104	93 - 107
8274110	% silt by hydrometer	2016/05/19	1.0	35	92	90 - 110
8274110	Clay Content	2016/05/19	1.4	35	103	86 - 114

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

VALIDATION SIGNATURE PAGE

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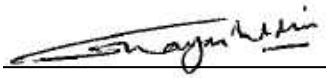

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

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MAXXAM ANALYTICS
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541

ARCADIS Canada Inc - Ottawa
Maxxam PM Parnian Baber

SUBCONTRACTING REQUEST FORM

To: Campo to Calgary Subcontract

Job# B697905

☐ Yes ☒ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Sample ID	Matrix	Test(s) Required	Container	Date Sampled	Date Required
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	Temp. 1	Temp. 2	Temp. 3			
Cooler #1	1	1	0	Custody Seal Present	~~YES~~ ✓	NO
				Custody Seal Intact	~~YES~~ ✓	NO
				Ice Present Upon Receipt	~~YES~~ ✓	NO
Cooler #2				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #3				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO

Receiving Maxxam Location: Campo to Calgary Subcontract JOB # _____

Relinquished by (Sign) _____ (print) MUSROP NOR Date and Time 2016/05/16 14:30

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Reporting Requirements:

National:

Regional:

B637938_COC

17-May-16 08:38
Joyce Kimani
B637938

JKU INS-0114

Shipping Instructions

☐ Ship Immediately (highlight Yellow)
☐ Requires 9am
☐ Requires Sat. Delivery
☐ Regular Ship next available day
☐ Ship Cold
☐ Ship Room Temp
☐ Ship Frozen
☐ COC Must be Attached

Sender (Print) _____ Initial _____

Shipping Department Checklist

☐ Correct Shipping location
☐ Correct Sample Ids (Paperwork vs Bottles)
☐ Yes ☐ No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____ Number of coolers _____
Shipper (Print) _____ Initial _____

Your Project #: 450 271 000
Site Location: TRIM ROAD

Attention:Stephanie Joyce

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Your C.O.C. #: 560838-01-01, 560838-02-01, 560838-03-01, 560838-04-01, 561532-01-01, 58919

Report Date: 2016/05/26
Report #: R4003859
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B697905
Received: 2016/05/13, 17:20

Sample Matrix: Soil
Samples Received: 39

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	2	N/A	2016/05/20	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	2	2016/05/19	2016/05/19	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	2	N/A	2016/05/20		EPA 8260C m
Free (WAD) Cyanide (1)	19	2016/05/17	2016/05/19	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide (1)	6	2016/05/18	2016/05/19	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	19	2016/05/19	2016/05/19	CAM SOP-00414	OMOE E3138 v2 m
Conductivity (1)	1	2016/05/20	2016/05/20	CAM SOP-00414	OMOE E3138 v2 m
Hexavalent Chromium in Soil by IC (1, 2)	2	2016/05/18	2016/05/24	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 3)	2	N/A	2016/05/20	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 4)	1	2016/05/19	2016/05/23	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 4)	1	2016/05/19	2016/05/24	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	2	2016/05/25	2016/05/25	CAM SOP-00316	CCME PHC-CWS m
Fraction Organic Carbon in Triplicate (1)	4	N/A	2016/05/20	CAM SOP-00468	Lloyd Kahn Method
Strong Acid Leachable Metals by ICPMS (1)	2	2016/05/18	2016/05/18	CAM SOP-00447	EPA 6020A m
Strong Acid Leachable Metals by ICPMS (1)	8	2016/05/18	2016/05/19	CAM SOP-00447	EPA 6020A m
Strong Acid Leachable Metals by ICPMS (1)	4	2016/05/19	2016/05/19	CAM SOP-00447	EPA 6020A m
Strong Acid Leachable Metals by ICPMS (1)	1	2016/05/20	2016/05/20	CAM SOP-00447	EPA 6020A m
Strong Acid Leachable Metals by ICPMS (1)	1	2016/05/25	2016/05/25	CAM SOP-00447	EPA 6020A m
Moisture (1)	6	N/A	2016/05/18	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture (1)	19	N/A	2016/05/19	CAM SOP-00445	Carter 2nd ed 51.2 m
OC Pesticides (Selected) & PCB (1, 5)	2	2016/05/18	2016/05/20	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters (1)	2	N/A	2016/05/18	CAM SOP-00307	EPA 8081/8082 m
PAH Compounds in Soil by GC/MS (SIM) (1)	2	2016/05/17	2016/05/18	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT (1)	2	2016/05/19	2016/05/19	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	2	N/A	2016/05/19	CAM SOP-00102	EPA 6010
SAR - ICP Metals (1)	2	2016/05/19	2016/05/19	CAM SOP-00408	EPA 6010 m

Your Project #: 450 271 000
Site Location: TRIM ROAD

Attention:Stephanie Joyce

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Your C.O.C. #: 560838-01-01, 560838-02-01, 560838-03-01, 560838-04-01, 561532-01-01, 58919

Report Date: 2016/05/26
Report #: R4003859
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B697905
Received: 2016/05/13, 17:20

Sample Matrix: Soil
Samples Received: 39

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Organic Carbon in Triplicate (1)	4	N/A	2016/05/20	CAM SOP-00468	Lloyd Kahn Method
Volatile Organic Compounds in Soil (1)	1	N/A	2016/05/19	CAM SOP-00228	EPA 8260C m
Volatile Organic Compounds in Soil (1)	1	N/A	2016/05/20	CAM SOP-00228	EPA 8260C m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Your Project #: 450 271 000
Site Location: TRIM ROAD

Attention:Stephanie Joyce

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Your C.O.C. #: 560838-01-01, 560838-02-01, 560838-03-01, 560838-04-01, 561532-01-01, 58919

Report Date: 2016/05/26
Report #: R4003859
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B697905
Received: 2016/05/13, 17:20

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573
==========
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Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		CIZ148	CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	561532-01-01	58919		
	UNITS	**SP203**	**SP203 Lab-Dup**	**DUP-6**	**RDL**	**QC Batch**
Calculated Parameters						
Sodium Adsorption Ratio	N/A	0.31		0.35		4498795
Inorganics						
Conductivity	mS/cm	0.12	0.12	0.10	0.002	4504722
Free Cyanide	ug/g	<0.01		<0.01	0.01	4500982
Moisture	%	6.3		7.6	1.0	4505040
Available (CaCl2) pH	pH	7.92		8.03		4503643
Metals						
Soluble Calcium (Ca)	mg/L	15.9		13.3	0.5	4504698
Soluble Magnesium (Mg)	mg/L	2.2		1.5	0.5	4504698
Soluble Sodium (Na)	mg/L	<5		<5	5	4504698
Inorganics						
Chromium (VI)	ug/g	0.5		1.4	0.2	4503532
Metals						
Hot Water Ext. Boron (B)	ug/g	0.16		0.14	0.050	4504766
Acid Extractable Antimony (Sb)	ug/g	<0.20		<0.20	0.20	4502884
Acid Extractable Arsenic (As)	ug/g	2.3		2.4	1.0	4502884
Acid Extractable Barium (Ba)	ug/g	72		57	0.50	4502884
Acid Extractable Beryllium (Be)	ug/g	0.41		<0.20	0.20	4502884
Acid Extractable Boron (B)	ug/g	6.1		<5.0	5.0	4502884
Acid Extractable Cadmium (Cd)	ug/g	0.11		<0.10	0.10	4502884
Acid Extractable Chromium (Cr)	ug/g	19		11	1.0	4502884
Acid Extractable Cobalt (Co)	ug/g	8.1		3.8	0.10	4502884
Acid Extractable Copper (Cu)	ug/g	16		8.1	0.50	4502884
Acid Extractable Lead (Pb)	ug/g	8.2		21	1.0	4502884
Acid Extractable Molybdenum (Mo)	ug/g	<0.50		1.0	0.50	4502884
Acid Extractable Nickel (Ni)	ug/g	17		8.3	0.50	4502884
Acid Extractable Selenium (Se)	ug/g	<0.50		<0.50	0.50	4502884
Acid Extractable Silver (Ag)	ug/g	<0.20		<0.20	0.20	4502884
Acid Extractable Thallium (Tl)	ug/g	0.14		0.11	0.050	4502884
Acid Extractable Uranium (U)	ug/g	0.46		0.35	0.050	4502884
Acid Extractable Vanadium (V)	ug/g	26		20	5.0	4502884
Acid Extractable Zinc (Zn)	ug/g	39		38	5.0	4502884
Acid Extractable Mercury (Hg)	ug/g	<0.050		<0.050	0.050	4502884

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	58919		
	UNITS	**SP203**	**DUP-6**	**RDL**	**QC Batch**
Calculated Parameters					
Chlordane (Total)	ug/g	<0.020	<0.020	0.020	4498743
o,p-DDD + p,p-DDD	ug/g	<0.020	<0.020	0.020	4498743
o,p-DDE + p,p-DDE	ug/g	<0.020	<0.020	0.020	4498743
o,p-DDT + p,p-DDT	ug/g	<0.020	<0.020	0.020	4498743
Total Endosulfan	ug/g	<0.020	<0.020	0.020	4498743
Total PCB	ug/g	<0.15	<0.15	0.15	4498743
Pesticides & Herbicides					
Aldrin	ug/g	<0.020	<0.020	0.020	4503510
a-Chlordane	ug/g	<0.020	<0.020	0.020	4503510
g-Chlordane	ug/g	<0.020	<0.020	0.020	4503510
o,p-DDD	ug/g	<0.020	<0.020	0.020	4503510
p,p-DDD	ug/g	<0.020	<0.020	0.020	4503510
o,p-DDE	ug/g	<0.020	<0.020	0.020	4503510
p,p-DDE	ug/g	<0.020	<0.020	0.020	4503510
o,p-DDT	ug/g	<0.020	<0.020	0.020	4503510
p,p-DDT	ug/g	<0.020	<0.020	0.020	4503510
Dieldrin	ug/g	<0.020	<0.020	0.020	4503510
Lindane	ug/g	<0.020	<0.020	0.020	4503510
Endosulfan I (alpha)	ug/g	<0.020	<0.020	0.020	4503510
Endosulfan II (beta)	ug/g	<0.020	<0.020	0.020	4503510
Endrin	ug/g	<0.020	<0.020	0.020	4503510
Heptachlor	ug/g	<0.020	<0.020	0.020	4503510
Heptachlor epoxide	ug/g	<0.020	<0.020	0.020	4503510
Hexachlorobenzene	ug/g	<0.020	<0.020	0.020	4503510
Hexachlorobutadiene	ug/g	<0.010	<0.010	0.010	4503510
Hexachloroethane	ug/g	<0.010	<0.010	0.010	4503510
Methoxychlor	ug/g	<0.050	<0.050	0.050	4503510
Aroclor 1242	ug/g	<0.15	<0.15	0.15	4503510
Aroclor 1248	ug/g	<0.15	<0.15	0.15	4503510
Aroclor 1254	ug/g	<0.15	<0.15	0.15	4503510
Aroclor 1260	ug/g	<0.15	<0.15	0.15	4503510
Surrogate Recovery (%)					
2,4,5,6-Tetrachloro-m-xylene	%	86	90		4503510
Decachlorobiphenyl	%	73	71		4503510

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

O.REG 153 PAHS (SOIL)

Maxxam ID		CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	58919		
	UNITS	**SP203**	**DUP-6**	**RDL**	**QC Batch**
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/g	<0.14	<0.14	0.14	4499024
Polyaromatic Hydrocarbons					
Acenaphthene	ug/g	<0.10	<0.10	0.10	4501794
Acenaphthylene	ug/g	<0.10	<0.10	0.10	4501794
Anthracene	ug/g	<0.10	<0.10	0.10	4501794
Benzo(a)anthracene	ug/g	<0.10	<0.10	0.10	4501794
Benzo(a)pyrene	ug/g	<0.10	<0.10	0.10	4501794
Benzo(b/j)fluoranthene	ug/g	<0.10	<0.10	0.10	4501794
Benzo(g,h,i)perylene	ug/g	<0.10	<0.10	0.10	4501794
Benzo(k)fluoranthene	ug/g	<0.10	<0.10	0.10	4501794
Chrysene	ug/g	<0.10	<0.10	0.10	4501794
Dibenz(a,h)anthracene	ug/g	<0.10	<0.10	0.10	4501794
Fluoranthene	ug/g	<0.10	<0.10	0.10	4501794
Fluorene	ug/g	<0.10	<0.10	0.10	4501794
Indeno(1,2,3-cd)pyrene	ug/g	<0.10	<0.10	0.10	4501794
1-Methylnaphthalene	ug/g	<0.10	<0.10	0.10	4501794
2-Methylnaphthalene	ug/g	<0.10	<0.10	0.10	4501794
Naphthalene	ug/g	<0.10	<0.10	0.10	4501794
Phenanthrene	ug/g	<0.10	<0.10	0.10	4501794
Pyrene	ug/g	<0.10	<0.10	0.10	4501794
Surrogate Recovery (%)					
D10-Anthracene	%	96	104		4501794
D14-Terphenyl (FS)	%	74	92		4501794
D8-Acenaphthylene	%	74	83		4501794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	58919		
	UNITS	**SP203**	**DUP-6**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons					
F1 (C6-C10)	ug/g	<10	<10	10	4505290
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	4505290
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/g	11	23	10	4505412
F3 (C16-C34 Hydrocarbons)	ug/g	1400	1900	50	4505412
F4 (C34-C50 Hydrocarbons)	ug/g	4600	6300	50	4505412
Reached Baseline at C50	ug/g	No	No		4505412
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	93	93		4505290
4-Bromofluorobenzene	%	104	106		4505290
D10-Ethylbenzene	%	92	96		4505290
D4-1,2-Dichloroethane	%	91	95		4505290
o-Terphenyl	%	107	111		4505412
RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

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O.REG 153 VOLATILE ORGANICS (SOIL)

Maxxam ID		CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	58919		
	UNITS	**SP203**	**DUP-6**	**RDL**	**QC Batch**
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	0.050	4498794
Volatile Organics					
Acetone (2-Propanone)	ug/g	<0.50	<0.50	0.50	4502572
Benzene	ug/g	<0.020	<0.020	0.020	4502572
Bromodichloromethane	ug/g	<0.050	<0.050	0.050	4502572
Bromoform	ug/g	<0.050	<0.050	0.050	4502572
Bromomethane	ug/g	<0.050	<0.050	0.050	4502572
Carbon Tetrachloride	ug/g	<0.050	<0.050	0.050	4502572
Chlorobenzene	ug/g	<0.050	<0.050	0.050	4502572
Chloroform	ug/g	<0.050	<0.050	0.050	4502572
Dibromochloromethane	ug/g	<0.050	<0.050	0.050	4502572
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4502572
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4502572
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4502572
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	0.050	4502572
1,1-Dichloroethane	ug/g	<0.050	<0.050	0.050	4502572
1,2-Dichloroethane	ug/g	<0.050	<0.050	0.050	4502572
1,1-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4502572
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4502572
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4502572
1,2-Dichloropropane	ug/g	<0.050	<0.050	0.050	4502572
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	0.030	4502572
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	0.040	4502572
Ethylbenzene	ug/g	<0.020	<0.020	0.020	4502572
Ethylene Dibromide	ug/g	<0.050	<0.050	0.050	4502572
Hexane	ug/g	<0.050	<0.050	0.050	4502572
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	0.050	4502572
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	0.50	4502572
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	0.50	4502572
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	0.050	4502572
Styrene	ug/g	<0.050	<0.050	0.050	4502572
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	4502572
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	4502572
Tetrachloroethylene	ug/g	<0.050	<0.050	0.050	4502572

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOLATILE ORGANICS (SOIL)

Maxxam ID		CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	58919		
	UNITS	**SP203**	**DUP-6**	**RDL**	**QC Batch**
Toluene	ug/g	<0.020	0.023	0.020	4502572
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	0.050	4502572
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	0.050	4502572
Trichloroethylene	ug/g	<0.050	<0.050	0.050	4502572
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	0.050	4502572
Vinyl Chloride	ug/g	<0.020	<0.020	0.020	4502572
p+m-Xylene	ug/g	<0.020	0.026	0.020	4502572
o-Xylene	ug/g	<0.020	<0.020	0.020	4502572
Total Xylenes	ug/g	<0.020	0.026	0.020	4502572
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	96	95		4502572
D10-o-Xylene	%	93	100		4502572
D4-1,2-Dichloroethane	%	95	91		4502572
D8-Toluene	%	97	98		4502572

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CIZ098	CIZ099	CIZ101	CIZ103	CIZ104		
Sampling Date		2016/05/12 10:00	2016/05/12 10:00	2016/05/12 10:15	2016/05/12 10:30	2016/05/12 10:30		
COC Number		560838-01-01	560838-01-01	560838-01-01	560838-01-01	560838-01-01		
	UNITS	**TP16-2-1**	**DUP-3**	**TP16-1-1**	**TP16-3-1**	**DUP-1**	**RDL**	**QC Batch**
Inorganics								
Conductivity	mS/cm	0.83	0.82	0.75	0.33	0.35	0.002	4504722

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CIZ106	CIZ107	CIZ109	CIZ112	CIZ114		
Sampling Date		2016/05/12 10:45	2016/05/12 10:45	2016/05/12 11:00	2016/05/12 11:15	2016/05/12 11:30		
COC Number		560838-01-01	560838-01-01	560838-02-01	560838-02-01	560838-02-01		
	UNITS	**TP16-4-1**	**DUP-2**	**TP16-5-1**	**TP16-7-1**	**TP16-6-1**	**RDL**	**QC Batch**
Calculated Parameters								
Fraction of Organic Carbon	g/g	0.0050	0.0077				0.0005	4499025
Fraction of Organic Carbon (rep.#1)	g/g	0.011	0.0090				0.0005	4499025
Fraction of Organic Carbon (rep.#2)	g/g	0.0097	0.011				0.0005	4499025
Average FOC Result	g/g	0.0085	0.0091				0.0005	4499025
Inorganics								
Conductivity	mS/cm	0.97	0.88	2.5	1.6	2.3	0.002	4504722
Free Cyanide	ug/g	<0.01	<0.01				0.01	4503412
Moisture	%	7.7	9.2				1.0	4503501
Total Organic Carbon	mg/kg	5000	7700				500	4505033
Total Organic Carbon (repeat #1)	mg/kg	11000	9000				500	4505033
Total Organic Carbon (repeat #2)	mg/kg	9700	11000				500	4505033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CIZ115	CIZ119	CIZ120	CIZ121	CIZ122		
Sampling Date		2016/05/12 11:30	2016/05/12 12:00	2016/05/12 12:30	2016/05/12 12:45	2016/05/12 13:00		
COC Number		560838-02-01	560838-03-01	560838-03-01	560838-03-01	560838-03-01		
	UNITS	**TP16-6-2**	**TP16-13-1**	**TP16-8-1**	**TP16-9-1**	**TP16-10-1**	**RDL**	**QC Batch**
Calculated Parameters								
Fraction of Organic Carbon	g/g	0.0006					0.0005	4499025
Fraction of Organic Carbon (rep.#1)	g/g	0.0007					0.0005	4499025
Fraction of Organic Carbon (rep.#2)	g/g	0.0006					0.0005	4499025
Average FOC Result	g/g	0.0006					0.0005	4499025
Inorganics								
Conductivity	mS/cm	1.9	0.77	0.38	1.2	0.91	0.002	4504722
Free Cyanide	ug/g	<0.01					0.01	4503412
Moisture	%	28					1.0	4503501
Total Organic Carbon	mg/kg	640					500	4505033
Total Organic Carbon (repeat #1)	mg/kg	650					500	4505033
Total Organic Carbon (repeat #2)	mg/kg	620					500	4505033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CIZ123		CIZ126		CIZ127	CIZ127		
Sampling Date		2016/05/12 13:15		2016/05/12 13:30		2016/05/12 13:30	2016/05/12 13:30		
COC Number		560838-03-01		560838-03-01		560838-03-01	560838-03-01		
	UNITS	**TP16-11-1**	**QC Batch**	**TP16-12-1**	**QC Batch**	**TP16-12-2**	**TP16-12-2 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Fraction of Organic Carbon	g/g		4499025		4499025	0.0061		0.0005	4499025
Fraction of Organic Carbon (rep.#1)	g/g		4499025		4499025	0.0059		0.0005	4499025
Fraction of Organic Carbon (rep.#2)	g/g		4499025		4499025	0.0063		0.0005	4499025
Average FOC Result	g/g		4499025		4499025	0.0061		0.0005	4499025
Inorganics									
Conductivity	mS/cm	2.4	4504722	0.27	4506616	0.37		0.002	4504722
Free Cyanide	ug/g		4503412			0.01	0.01	0.01	4503412
Moisture	%		4503501			21		1.0	4503501
Total Organic Carbon	mg/kg		4505033			6100		500	4505033
Total Organic Carbon (repeat #1)	mg/kg		4505033			5900		500	4505033
Total Organic Carbon (repeat #2)	mg/kg		4505033			6300		500	4505033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CIZ129		CIZ130	CIZ130		CIZ131		
Sampling Date		2016/05/12 14:00		2016/05/12 14:30	2016/05/12 14:30		2016/05/12 15:00		
COC Number		560838-04-01		560838-04-01	560838-04-01		560838-04-01		
	UNITS	**TP16-14-1**	**RDL**	**TP16-15-1**	**TP16-15-1 Lab-Dup**	**RDL**	**SP101**	**RDL**	**QC Batch**
Inorganics									
Free Cyanide	ug/g	0.05	0.02	<0.01		0.01	0.07	0.04	4500982
Moisture	%	25	1.0	27	28	1.0	24	1.0	4505040

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		CIZ132	CIZ133	CIZ134	CIZ134	CIZ135		
Sampling Date		2016/05/12 15:00	2016/05/12 15:00	2016/05/12 15:00	2016/05/12 15:00	2016/05/12 15:00		
COC Number		560838-04-01	560838-04-01	560838-04-01	560838-04-01	560838-04-01		
	UNITS	**SP102**	**SP103**	**SP104**	**SP104 Lab-Dup**	**SP105**	**RDL**	**QC Batch**
Inorganics								
Free Cyanide	ug/g	0.07	0.07	0.06	0.07	0.05	0.04	4500982
Moisture	%	25	22	22		23	1.0	4505040

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		CIZ136			CIZ137	CIZ138		
Sampling Date		2016/05/12 15:00			2016/05/12 15:00	2016/05/12 15:00		
COC Number		560838-04-01			560838-04-01	560838-04-01		
	UNITS	**SP106**	**RDL**	**QC Batch**	**DUP-4**	**DUP-5**	**RDL**	**QC Batch**
Inorganics								
Free Cyanide	ug/g	0.04	0.02	4503412	0.05	0.05	0.04	4500982
Moisture	%	22	1.0	4503501	23	25	1.0	4505040

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CIZ139			CIZ140	CIZ141	CIZ142		
Sampling Date		2016/05/12 15:00			2016/05/12 15:00	2016/05/12 15:00	2016/05/12 15:00		
COC Number		561532-01-01			561532-01-01	561532-01-01	561532-01-01		
	UNITS	**SP107**	**RDL**	**QC Batch**	**SP108**	**SP109**	**SP110**	**RDL**	**QC Batch**
Inorganics									
Free Cyanide	ug/g	0.06	0.02	4503412	0.07	0.04	0.06	0.04	4500982
Moisture	%	24	1.0	4503501	25	24	23	1.0	4505040

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CIZ143	CIZ144	CIZ145	CIZ146		CIZ147		
Sampling Date		2016/05/12 15:00	2016/05/12 15:00	2016/05/12 15:00	2016/05/12 15:00		2016/05/12 15:00		
COC Number		561532-01-01	561532-01-01	561532-01-01	561532-01-01		561532-01-01		
	UNITS	**SP111**	**SP112**	**SP113**	**SP114**	**RDL**	**SP115**	**RDL**	**QC Batch**
Inorganics									
Free Cyanide	ug/g	0.04	0.06	0.07	0.07	0.04	0.06	0.02	4500982
Moisture	%	23	22	26	25	1.0	23	1.0	4505040

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		CIZ098	CIZ099	CIZ101	CIZ103	CIZ104		
Sampling Date		2016/05/12 10:00	2016/05/12 10:00	2016/05/12 10:15	2016/05/12 10:30	2016/05/12 10:30		
COC Number		560838-01-01	560838-01-01	560838-01-01	560838-01-01	560838-01-01		
	UNITS	**TP16-2-1**	**DUP-3**	**TP16-1-1**	**TP16-3-1**	**DUP-1**	**RDL**	**QC Batch**
Metals								
Acid Extractable Chromium (Cr)	ug/g	10	9.4	71	67	120	1.0	4503161

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CIZ106	CIZ107		CIZ109	CIZ112	CIZ114		
Sampling Date		2016/05/12 10:45	2016/05/12 10:45		2016/05/12 11:00	2016/05/12 11:15	2016/05/12 11:30		
COC Number		560838-01-01	560838-01-01		560838-02-01	560838-02-01	560838-02-01		
	UNITS	**TP16-4-1**	**DUP-2**	**QC Batch**	**TP16-5-1**	**TP16-7-1**	**TP16-6-1**	**RDL**	**QC Batch**
Metals									
Acid Extractable Barium (Ba)	ug/g	450	490	4505017	440	240	320	0.50	4503161
Acid Extractable Chromium (Cr)	ug/g	12	10	4505017				1.0	
Acid Extractable Cobalt (Co)	ug/g	4.3	4.5	4505017				0.10	
Acid Extractable Vanadium (V)	ug/g	8.0	7.6	4505017				5.0	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CIZ115		CIZ123	CIZ123		CIZ126		
Sampling Date		2016/05/12 11:30		2016/05/12 13:15	2016/05/12 13:15		2016/05/12 13:30		
COC Number		560838-02-01		560838-03-01	560838-03-01		560838-03-01		
	UNITS	**TP16-6-2**	**QC Batch**	**TP16-11-1**	**TP16-11-1 Lab-Dup**	**QC Batch**	**TP16-12-1**	**RDL**	**QC Batch**
Metals									
Acid Extractable Barium (Ba)	ug/g	370	4505017	460	440	4510676	190	0.50	4506707
Acid Extractable Chromium (Cr)	ug/g	120	4505017					1.0	
Acid Extractable Cobalt (Co)	ug/g	32	4505017					0.10	
Acid Extractable Vanadium (V)	ug/g	99	4505017					5.0	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		CIZ127		
Sampling Date		2016/05/12 13:30		
COC Number		560838-03-01		
	UNITS	**TP16-12-2**	**RDL**	**QC Batch**
Metals				
Acid Extractable Barium (Ba)	ug/g	230	0.50	4505017
Acid Extractable Chromium (Cr)	ug/g	84	1.0	4505017
Acid Extractable Cobalt (Co)	ug/g	24	0.10	4505017
Acid Extractable Vanadium (V)	ug/g	79	5.0	4505017
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		CIZ148	CIZ150		
Sampling Date		2016/05/12 15:00	2016/05/13 10:00		
COC Number		561532-01-01	58919		
	UNITS	**SP203**	**DUP-6**	**RDL**	**QC Batch**
F2-F4 Hydrocarbons					
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	19000	22000	1000	4510664

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

Maxxam ID: CIZ098
Sample ID: TP16-2-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ099
Sample ID: DUP-3
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ101
Sample ID: TP16-1-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ103
Sample ID: TP16-3-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ104
Sample ID: DUP-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ106
Sample ID: TP16-4-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Fraction Organic Carbon in Triplicate		4499025	N/A	2016/05/20	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	4505017	2016/05/19	2016/05/19	Viviana Canzonieri
Moisture	BAL	4503501	N/A	2016/05/18	Shivani Desai
Total Organic Carbon in Triplicate	COMB	4505033	N/A	2016/05/20	Godwin Okereke

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TEST SUMMARY

Maxxam ID: CIZ107
Sample ID: DUP-2
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Fraction Organic Carbon in Triplicate		4499025	N/A	2016/05/20	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	4505017	2016/05/19	2016/05/19	Viviana Canzonieri
Moisture	BAL	4503501	N/A	2016/05/18	Shivani Desai
Total Organic Carbon in Triplicate	COMB	4505033	N/A	2016/05/20	Godwin Okereke

Maxxam ID: CIZ109
Sample ID: TP16-5-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ112
Sample ID: TP16-7-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ114
Sample ID: TP16-6-1
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4503161	2016/05/18	2016/05/19	Viviana Canzonieri

Maxxam ID: CIZ115
Sample ID: TP16-6-2
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Fraction Organic Carbon in Triplicate		4499025	N/A	2016/05/20	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	4505017	2016/05/19	2016/05/19	Viviana Canzonieri
Moisture	BAL	4503501	N/A	2016/05/18	Shivani Desai
Total Organic Carbon in Triplicate	COMB	4505033	N/A	2016/05/20	Godwin Okereke

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TEST SUMMARY

Maxxam ID: CIZ119 **Collected:** 2016/05/12
Sample ID: TP16-13-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis

Maxxam ID: CIZ120 **Collected:** 2016/05/12
Sample ID: TP16-8-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis

Maxxam ID: CIZ121 **Collected:** 2016/05/12
Sample ID: TP16-9-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis

Maxxam ID: CIZ122 **Collected:** 2016/05/12
Sample ID: TP16-10-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis

Maxxam ID: CIZ123 **Collected:** 2016/05/12
Sample ID: TP16-11-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4510676	2016/05/25	2016/05/25	Viviana Canzonieri

Maxxam ID: CIZ123 Dup **Collected:** 2016/05/12
Sample ID: TP16-11-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	4510676	2016/05/25	2016/05/25	Viviana Canzonieri

Maxxam ID: CIZ126 **Collected:** 2016/05/12
Sample ID: TP16-12-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4506616	2016/05/20	2016/05/20	Lemeneh Addis
Strong Acid Leachable Metals by ICPMS	ICP/MS	4506707	2016/05/20	2016/05/20	Viviana Canzonieri

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TEST SUMMARY

Maxxam ID: CIZ127 **Collected:** 2016/05/12
Sample ID: TP16-12-2 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Fraction Organic Carbon in Triplicate		4499025	N/A	2016/05/20	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	4505017	2016/05/19	2016/05/19	Viviana Canzonieri
Moisture	BAL	4503501	N/A	2016/05/18	Shivani Desai
Total Organic Carbon in Triplicate	COMB	4505033	N/A	2016/05/20	Godwin Okereke

Maxxam ID: CIZ127 Dup **Collected:** 2016/05/12
Sample ID: TP16-12-2 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham

Maxxam ID: CIZ129 **Collected:** 2016/05/12
Sample ID: TP16-14-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ130 **Collected:** 2016/05/12
Sample ID: TP16-15-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ130 Dup **Collected:** 2016/05/12
Sample ID: TP16-15-1 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ131 **Collected:** 2016/05/12
Sample ID: SP101 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

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TEST SUMMARY

Maxxam ID: CIZ132 **Collected:** 2016/05/12
Sample ID: SP102 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ133 **Collected:** 2016/05/12
Sample ID: SP103 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ134 **Collected:** 2016/05/12
Sample ID: SP104 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ134 Dup **Collected:** 2016/05/12
Sample ID: SP104 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham

Maxxam ID: CIZ135 **Collected:** 2016/05/12
Sample ID: SP105 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ136 **Collected:** 2016/05/12
Sample ID: SP106 **Shipped:**
Matrix: Soil **Received:** 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham
Moisture	BAL	4503501	N/A	2016/05/18	Shivani Desai

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TEST SUMMARY

Maxxam ID: CIZ137
Sample ID: DUP-4
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ138
Sample ID: DUP-5
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ139
Sample ID: SP107
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4503412	2016/05/18	2016/05/19	Christine Pham
Moisture	BAL	4503501	N/A	2016/05/18	Shivani Desai

Maxxam ID: CIZ140
Sample ID: SP108
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ141
Sample ID: SP109
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ142
Sample ID: SP110
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

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TEST SUMMARY

Maxxam ID: CIZ143
Sample ID: SP111
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ144
Sample ID: SP112
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ145
Sample ID: SP113
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ146
Sample ID: SP114
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ147
Sample ID: SP115
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai

Maxxam ID: CIZ148
Sample ID: SP203
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4499024	N/A	2016/05/20	Automated Statchk
Hot Water Extractable Boron	ICP	4504766	2016/05/19	2016/05/19	Jolly John
1,3-Dichloropropene Sum	CALC	4498794	N/A	2016/05/20	Automated Statchk
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4503532	2016/05/18	2016/05/24	Manoj Gera

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Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

TEST SUMMARY

Maxxam ID: CIZ148
Sample ID: SP203
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4505290	N/A	2016/05/20	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4505412	2016/05/19	2016/05/23	Dorina Popa
F4G (CCME Hydrocarbons Gravimetric)	BAL	4510664	2016/05/25	2016/05/25	Raheela Usmani
Strong Acid Leachable Metals by ICPMS	ICP/MS	4502884	2016/05/18	2016/05/18	Viviana Canzonieri
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai
OC Pesticides (Selected) & PCB	GC/ECD	4503510	2016/05/18	2016/05/20	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4498743	N/A	2016/05/18	Automated Statchk
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4501794	2016/05/17	2016/05/18	Jett Wu
pH CaCl2 EXTRACT	AT	4503643	2016/05/19	2016/05/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4498795	N/A	2016/05/19	Automated Statchk
SAR - ICP Metals	ICP	4504698	2016/05/19	2016/05/19	Jolly John
Volatile Organic Compounds in Soil	GC/MS	4502572	N/A	2016/05/20	Karen Hughes

Maxxam ID: CIZ148 Dup
Sample ID: SP203
Matrix: Soil

Collected: 2016/05/12
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis

Maxxam ID: CIZ150
Sample ID: DUP-6
Matrix: Soil

Collected: 2016/05/13
Shipped:
Received: 2016/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4499024	N/A	2016/05/20	Automated Statchk
Hot Water Extractable Boron	ICP	4504766	2016/05/19	2016/05/19	Jolly John
1,3-Dichloropropene Sum	CALC	4498794	N/A	2016/05/20	Automated Statchk
Free (WAD) Cyanide	TECH	4500982	2016/05/17	2016/05/19	Christine Pham
Conductivity	AT	4504722	2016/05/19	2016/05/19	Lemeneh Addis
Hexavalent Chromium in Soil by IC	IC/SPEC	4503532	2016/05/18	2016/05/24	Manoj Gera
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4505290	N/A	2016/05/20	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4505412	2016/05/19	2016/05/24	Dorina Popa
F4G (CCME Hydrocarbons Gravimetric)	BAL	4510664	2016/05/25	2016/05/25	Raheela Usmani
Strong Acid Leachable Metals by ICPMS	ICP/MS	4502884	2016/05/18	2016/05/18	Viviana Canzonieri
Moisture	BAL	4505040	N/A	2016/05/19	Shivani Desai
OC Pesticides (Selected) & PCB	GC/ECD	4503510	2016/05/18	2016/05/20	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4498743	N/A	2016/05/18	Automated Statchk
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4501794	2016/05/17	2016/05/18	Jett Wu
pH CaCl2 EXTRACT	AT	4503643	2016/05/19	2016/05/19	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	4498795	N/A	2016/05/19	Automated Statchk
SAR - ICP Metals	ICP	4504698	2016/05/19	2016/05/19	Jolly John
Volatile Organic Compounds in Soil	GC/MS	4502572	N/A	2016/05/19	Karen Hughes

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Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

GENERAL COMMENTS

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

Package 1	10.3°C
Package 2	10.0°C
Package 3	10.0°C
Package 4	9.7°C

OC Pesticide Analysis: Due to the sample matrix, samples required dilution. Detection limits were adjusted accordingly.

Sample CIZ148-01 : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Sample CIZ150-01 : PAH analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Results relate only to the items tested.

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Maxxam Job #: B697905
Report Date: 2016/05/26

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4501794	D10-Anthracene	2016/05/17	82	50 - 130	78	50 - 130	79	%				
4501794	D14-Terphenyl (FS)	2016/05/17	85	50 - 130	81	50 - 130	81	%				
4501794	D8-Acenaphthylene	2016/05/17	79	50 - 130	75	50 - 130	76	%				
4502572	4-Bromofluorobenzene	2016/05/19	102	60 - 140	103	60 - 140	97	%				
4502572	D10-o-Xylene	2016/05/19	105	60 - 130	103	60 - 130	98	%				
4502572	D4-1,2-Dichloroethane	2016/05/19	98	60 - 140	104	60 - 140	104	%				
4502572	D8-Toluene	2016/05/19	101	60 - 140	93	60 - 140	94	%				
4503510	2,4,5,6-Tetrachloro-m-xylene	2016/05/19	81	50 - 130	83	50 - 130	88	%				
4503510	Decachlorobiphenyl	2016/05/19	81	50 - 130	80	50 - 130	82	%				
4505290	1,4-Difluorobenzene	2016/05/19	94	60 - 140	96	60 - 140	91	%				
4505290	4-Bromofluorobenzene	2016/05/19	103	60 - 140	102	60 - 140	105	%				
4505290	D10-Ethylbenzene	2016/05/19	103	60 - 140	100	60 - 140	94	%				
4505290	D4-1,2-Dichloroethane	2016/05/19	93	60 - 140	89	60 - 140	87	%				
4505412	o-Terphenyl	2016/05/22	116	60 - 130	99	60 - 130	109	%				
4500982	Free Cyanide	2016/05/19	NC	75 - 125	97	80 - 120	<0.01	ug/g	NC	35		
4501794	1-Methylnaphthalene	2016/05/17	70	50 - 130	77	50 - 130	<0.0050	ug/g	NC	40		
4501794	2-Methylnaphthalene	2016/05/17	67	50 - 130	73	50 - 130	<0.0050	ug/g	NC	40		
4501794	Acenaphthene	2016/05/17	73	50 - 130	74	50 - 130	<0.0050	ug/g	NC	40		
4501794	Acenaphthylene	2016/05/17	73	50 - 130	71	50 - 130	<0.0050	ug/g	NC	40		
4501794	Anthracene	2016/05/17	76	50 - 130	75	50 - 130	<0.0050	ug/g	NC	40		
4501794	Benzo(a)anthracene	2016/05/17	85	50 - 130	83	50 - 130	<0.0050	ug/g	NC	40		
4501794	Benzo(a)pyrene	2016/05/17	81	50 - 130	78	50 - 130	<0.0050	ug/g	NC	40		
4501794	Benzo(b/j)fluoranthene	2016/05/17	80	50 - 130	81	50 - 130	<0.0050	ug/g	NC	40		
4501794	Benzo(g,h,i)perylene	2016/05/17	71	50 - 130	73	50 - 130	<0.0050	ug/g	NC	40		
4501794	Benzo(k)fluoranthene	2016/05/17	66	50 - 130	77	50 - 130	<0.0050	ug/g	NC	40		
4501794	Chrysene	2016/05/17	81	50 - 130	83	50 - 130	<0.0050	ug/g	NC	40		
4501794	Dibenz(a,h)anthracene	2016/05/17	73	50 - 130	65	50 - 130	<0.0050	ug/g	NC	40		
4501794	Fluoranthene	2016/05/17	81	50 - 130	78	50 - 130	<0.0050	ug/g	NC	40		
4501794	Fluorene	2016/05/17	75	50 - 130	73	50 - 130	<0.0050	ug/g	NC	40		
4501794	Indeno(1,2,3-cd)pyrene	2016/05/17	82	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40		
4501794	Naphthalene	2016/05/17	55	50 - 130	66	50 - 130	<0.0050	ug/g	NC	40		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4501794	Phenanthrene	2016/05/17	75	50 - 130	72	50 - 130	<0.0050	ug/g	NC	40		
4501794	Pyrene	2016/05/17	81	50 - 130	79	50 - 130	<0.0050	ug/g	NC	40		
4502572	1,1,1,2-Tetrachloroethane	2016/05/19	97	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4502572	1,1,1-Trichloroethane	2016/05/19	96	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4502572	1,1,2,2-Tetrachloroethane	2016/05/19	94	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4502572	1,1,2-Trichloroethane	2016/05/19	95	60 - 140	96	60 - 130	<0.050	ug/g	NC	50		
4502572	1,1-Dichloroethane	2016/05/19	93	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4502572	1,1-Dichloroethylene	2016/05/19	94	60 - 140	110	60 - 130	<0.050	ug/g	NC	50		
4502572	1,2-Dichlorobenzene	2016/05/19	97	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4502572	1,2-Dichloroethane	2016/05/19	95	60 - 140	104	60 - 130	<0.050	ug/g	NC	50		
4502572	1,2-Dichloropropane	2016/05/19	94	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4502572	1,3-Dichlorobenzene	2016/05/19	99	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4502572	1,4-Dichlorobenzene	2016/05/19	102	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4502572	Acetone (2-Propanone)	2016/05/19	86	60 - 140	110	60 - 140	<0.50	ug/g	NC	50		
4502572	Benzene	2016/05/19	97	60 - 140	100	60 - 130	<0.020	ug/g	NC	50		
4502572	Bromodichloromethane	2016/05/19	96	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4502572	Bromoform	2016/05/19	92	60 - 140	102	60 - 130	<0.050	ug/g	NC	50		
4502572	Bromomethane	2016/05/19	79	60 - 140	92	60 - 140	<0.050	ug/g	NC	50		
4502572	Carbon Tetrachloride	2016/05/19	99	60 - 140	102	60 - 130	<0.050	ug/g	NC	50		
4502572	Chlorobenzene	2016/05/19	97	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4502572	Chloroform	2016/05/19	97	60 - 140	102	60 - 130	<0.050	ug/g	NC	50		
4502572	cis-1,2-Dichloroethylene	2016/05/19	97	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4502572	cis-1,3-Dichloropropene	2016/05/19	92	60 - 140	99	60 - 130	<0.030	ug/g	NC	50		
4502572	Dibromochloromethane	2016/05/19	95	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4502572	Dichlorodifluoromethane (FREON 12)	2016/05/19	91	60 - 140	102	60 - 140	<0.050	ug/g	NC	50		
4502572	Ethylbenzene	2016/05/19	97	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
4502572	Ethylene Dibromide	2016/05/19	94	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4502572	Hexane	2016/05/19	96	60 - 140	112	60 - 130	<0.050	ug/g	NC	50		
4502572	Methyl Ethyl Ketone (2-Butanone)	2016/05/19	97	60 - 140	112	60 - 140	<0.50	ug/g	NC	50		
4502572	Methyl Isobutyl Ketone	2016/05/19	82	60 - 140	95	60 - 130	<0.50	ug/g	NC	50		
4502572	Methyl t-butyl ether (MTBE)	2016/05/19	87	60 - 140	104	60 - 130	<0.050	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4502572	Methylene Chloride(Dichloromethane)	2016/05/19	92	60 - 140	114	60 - 130	<0.050	ug/g	NC	50		
4502572	o-Xylene	2016/05/19	96	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
4502572	p+m-Xylene	2016/05/19	96	60 - 140	96	60 - 130	<0.020	ug/g	NC	50		
4502572	Styrene	2016/05/19	98	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4502572	Tetrachloroethylene	2016/05/19	100	60 - 140	94	60 - 130	<0.050	ug/g	NC	50		
4502572	Toluene	2016/05/19	96	60 - 140	90	60 - 130	<0.020	ug/g	NC	50		
4502572	Total Xylenes	2016/05/19					<0.020	ug/g	NC	50		
4502572	trans-1,2-Dichloroethylene	2016/05/19	90	60 - 140	108	60 - 130	<0.050	ug/g	NC	50		
4502572	trans-1,3-Dichloropropene	2016/05/19	85	60 - 140	86	60 - 130	<0.040	ug/g	NC	50		
4502572	Trichloroethylene	2016/05/19	98	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4502572	Trichlorofluoromethane (FREON 11)	2016/05/19	95	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4502572	Vinyl Chloride	2016/05/19	99	60 - 140	110	60 - 130	<0.020	ug/g	NC	50		
4502884	Acid Extractable Antimony (Sb)	2016/05/18	98	75 - 125	99	80 - 120	<0.20	ug/g	NC	30		
4502884	Acid Extractable Arsenic (As)	2016/05/18	100	75 - 125	102	80 - 120	<1.0	ug/g	NC	30		
4502884	Acid Extractable Barium (Ba)	2016/05/18	NC	75 - 125	100	80 - 120	<0.50	ug/g	3.1	30		
4502884	Acid Extractable Beryllium (Be)	2016/05/18	102	75 - 125	96	80 - 120	<0.20	ug/g	NC	30		
4502884	Acid Extractable Boron (B)	2016/05/18	97	75 - 125	92	80 - 120	<5.0	ug/g	NC	30		
4502884	Acid Extractable Cadmium (Cd)	2016/05/18	104	75 - 125	101	80 - 120	<0.10	ug/g	NC	30		
4502884	Acid Extractable Chromium (Cr)	2016/05/18	NC	75 - 125	104	80 - 120	<1.0	ug/g	4.5	30		
4502884	Acid Extractable Cobalt (Co)	2016/05/18	102	75 - 125	100	80 - 120	<0.10	ug/g	0.23	30		
4502884	Acid Extractable Copper (Cu)	2016/05/18	NC	75 - 125	101	80 - 120	<0.50	ug/g	0.85	30		
4502884	Acid Extractable Lead (Pb)	2016/05/18	110	75 - 125	100	80 - 120	<1.0	ug/g	2.4	30		
4502884	Acid Extractable Mercury (Hg)	2016/05/18	103	75 - 125	99	80 - 120	<0.050	ug/g	NC	30		
4502884	Acid Extractable Molybdenum (Mo)	2016/05/18	105	75 - 125	102	80 - 120	<0.50	ug/g	NC	30		
4502884	Acid Extractable Nickel (Ni)	2016/05/18	NC	75 - 125	100	80 - 120	<0.50	ug/g	1.2	30		
4502884	Acid Extractable Selenium (Se)	2016/05/18	102	75 - 125	102	80 - 120	<0.50	ug/g	NC	30		
4502884	Acid Extractable Silver (Ag)	2016/05/18	102	75 - 125	101	80 - 120	<0.20	ug/g	NC	30		
4502884	Acid Extractable Thallium (Tl)	2016/05/18	100	75 - 125	100	80 - 120	<0.050	ug/g	NC	30		
4502884	Acid Extractable Uranium (U)	2016/05/18	102	75 - 125	101	80 - 120	<0.050	ug/g	0.85	30		
4502884	Acid Extractable Vanadium (V)	2016/05/18	NC	75 - 125	101	80 - 120	<5.0	ug/g	NC	30		
4502884	Acid Extractable Zinc (Zn)	2016/05/18	NC	75 - 125	96	80 - 120	<5.0	ug/g	2.2	30		

Maxxam Job #: B697905
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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4503161	Acid Extractable Barium (Ba)	2016/05/19	NC	75 - 125	103	80 - 120	<0.50	ug/g	18	30		
4503161	Acid Extractable Chromium (Cr)	2016/05/19	97	75 - 125	104	80 - 120	<1.0	ug/g	8.3	30		
4503412	Free Cyanide	2016/05/19	100	75 - 125	102	80 - 120	<0.01	ug/g	NC	35		
4503501	Moisture	2016/05/18							0	20		
4503510	a-Chlordane	2016/05/19	85	50 - 130	89	50 - 130	<0.0020	ug/g	NC	40		
4503510	Aldrin	2016/05/19	90	50 - 130	79	50 - 130	<0.0020	ug/g	NC	40		
4503510	Aroclor 1242	2016/05/19					<0.015	ug/g	NC	40		
4503510	Aroclor 1248	2016/05/19					<0.015	ug/g				
4503510	Aroclor 1254	2016/05/19					<0.015	ug/g				
4503510	Aroclor 1260	2016/05/19					<0.015	ug/g				
4503510	Dieldrin	2016/05/19	93	50 - 130	96	50 - 130	<0.0020	ug/g	NC	40		
4503510	Endosulfan I (alpha)	2016/05/19	76	50 - 130	76	50 - 130	<0.0020	ug/g	NC	40		
4503510	Endosulfan II (beta)	2016/05/19	86	50 - 130	83	50 - 130	<0.0020	ug/g	NC	40		
4503510	Endrin	2016/05/19	89	50 - 130	88	50 - 130	<0.0020	ug/g	NC	40		
4503510	g-Chlordane	2016/05/19	83	50 - 130	86	50 - 130	<0.0020	ug/g	NC	40		
4503510	Heptachlor epoxide	2016/05/19	85	50 - 130	86	50 - 130	<0.0020	ug/g	NC	40		
4503510	Heptachlor	2016/05/19	87	50 - 130	87	50 - 130	<0.0020	ug/g	NC	40		
4503510	Hexachlorobenzene	2016/05/19	80	50 - 130	82	50 - 130	<0.0020	ug/g	NC	40		
4503510	Hexachlorobutadiene	2016/05/19	78	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40		
4503510	Hexachloroethane	2016/05/19	57	50 - 130	69	50 - 130	<0.0050	ug/g	NC	40		
4503510	Lindane	2016/05/19	78	50 - 130	82	50 - 130	<0.0020	ug/g	NC	40		
4503510	Methoxychlor	2016/05/19	108	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40		
4503510	o,p-DDD	2016/05/19	102	50 - 130	99	50 - 130	<0.0020	ug/g	NC	40		
4503510	o,p-DDE	2016/05/19	86	50 - 130	86	50 - 130	<0.0020	ug/g	NC	40		
4503510	o,p-DDT	2016/05/19	92	50 - 130	92	50 - 130	<0.0020	ug/g	NC	40		
4503510	p,p-DDD	2016/05/19	85	50 - 130	87	50 - 130	<0.0020	ug/g	NC	40		
4503510	p,p-DDE	2016/05/19	89	50 - 130	85	50 - 130	<0.0020	ug/g	NC	40		
4503510	p,p-DDT	2016/05/19	101	50 - 130	98	50 - 130	<0.0020	ug/g	NC	40		
4503532	Chromium (VI)	2016/05/24	85	75 - 125	86	80 - 120	<0.2	ug/g	NC	35	79	75 - 125
4503643	Available (CaCl2) pH	2016/05/19			99	97 - 103			1.2	N/A		
4504698	Soluble Calcium (Ca)	2016/05/19			95	80 - 120	<0.5	mg/L	0.086	30		

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Maxxam Job #: B697905
Report Date: 2016/05/26

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4504698	Soluble Magnesium (Mg)	2016/05/19			102	80 - 120	<0.5	mg/L	NC	30		
4504698	Soluble Sodium (Na)	2016/05/19			96	80 - 120	<5	mg/L	NC	30		
4504722	Conductivity	2016/05/19			100	90 - 110	<0.002	mS/cm	0.42	10		
4504766	Hot Water Ext. Boron (B)	2016/05/19	96	75 - 125	94	75 - 125	<0.050	ug/g	NC	40		
4505017	Acid Extractable Barium (Ba)	2016/05/19	NC	75 - 125	98	80 - 120	<0.50	ug/g	3.3	30		
4505017	Acid Extractable Chromium (Cr)	2016/05/19	101	75 - 125	99	80 - 120	<1.0	ug/g	11	30		
4505017	Acid Extractable Cobalt (Co)	2016/05/19	98	75 - 125	99	80 - 120	<0.10	ug/g	10	30		
4505017	Acid Extractable Vanadium (V)	2016/05/19	NC	75 - 125	99	80 - 120	<5.0	ug/g	NC	30		
4505033	Total Organic Carbon	2016/05/20					<500	mg/kg			106	75 - 125
4505040	Moisture	2016/05/19							3.3	20		
4505290	F1 (C6-C10) - BTEX	2016/05/19					<10	ug/g	NC	30		
4505290	F1 (C6-C10)	2016/05/19	89	60 - 140	97	80 - 120	<10	ug/g	NC	30		
4505412	F2 (C10-C16 Hydrocarbons)	2016/05/24	NC	50 - 130	97	80 - 120	<10	ug/g	21	30		
4505412	F3 (C16-C34 Hydrocarbons)	2016/05/24	113	50 - 130	97	80 - 120	<50	ug/g	NC	30		
4505412	F4 (C34-C50 Hydrocarbons)	2016/05/24	114	50 - 130	98	80 - 120	<50	ug/g	NC	30		
4506616	Conductivity	2016/05/20			100	90 - 110	<0.002	mS/cm	0.18	10		
4506707	Acid Extractable Barium (Ba)	2016/05/20	NC	75 - 125	106	80 - 120	<0.50	ug/g	5.6	30		
4510664	F4G-sg (Grav. Heavy Hydrocarbons)	2016/05/25	NC	65 - 135	102	65 - 135	<100	ug/g	3.5	50		
4510676	Acid Extractable Barium (Ba)	2016/05/25	NC	75 - 125	105	80 - 120	<0.50	ug/g	3.8	30		

N/A = Not Applicable

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

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

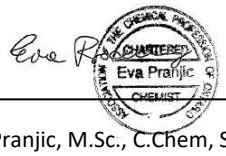
Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B697905
Report Date: 2016/05/26

ARCADIS Canada Inc
Client Project #: 450 271 000
Site Location: TRIM ROAD

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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

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

13-May-16 17:20
Parnian Baber
B697905
MAF ENV-963
C#560838-01-01

Page 1 of 5
Bottle Order #: 560838
Project Manager: Parnian Baber

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	Arcadis	Quotation #:	B63225
Attention:	Invoices Attention	Attention:	Stephanie Joyce	P.O. #:	
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:	329 Churchill Ave N Ottawa ON	Project:	Trim Road
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	613-721-0555 Fax: 613-721-0029	Project Name:	450 271-000 12
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	stephanie.joyce@arcadis.com	Site #:	
				Sampled By:	S. Hannington

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other

Special Instructions: Samples incorrectly labelled as "Bri" please call "TP"

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Free (WAD) Cyanide	Ba in soil	Cr in soil	Conductivity	Fraction Organic Carbon in Triplicate	V, Co in soil	Soil Texture (% sand, %silt, %clay)	# of Bottles	Comments
1		TP16-2-1	16/5/12	10:00	SOIL	N			X	X				1	
2		DUP-3		10:00	SOIL				X	X				1	
3		TP16-2-2		10:00	SOIL				X	X				1	Hold for analysis
4		TP16-1-1		10:15	SOIL				X	X				1	
5		TP16-1-2		10:15	SOIL				X	X				1	Hold for analysis
6		TP16-3-1		10:30	SOIL				X	X				1	
7		DUP-1		10:30	SOIL				X	X				1	
8		TP16-3-2		10:30	SOIL				X	X				1	Hold for analysis
9		TP16-4-1		10:45	SOIL		X	X	X	X	X	X		2	
10		DUP-2		10:45	SOIL		X	X	X	X	X	X		1	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Sk Hannington	16/5/13	15:20	[illegible] Fatemeh	2016/05/13	17:20	
			[illegible] TARWIN GREWAL	2016/05/14	10:04	

Laboratory Use Only
Time Sensitive: ___ Temperature (°C) on Receipt: 11,10,10
Custody Seal: Present ✓ Intact ___ Yes ___ No ___

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.
SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM
White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics
ONE CE RECEIVED IN OTTAWA
REFER TO ATR 10,10,10 / 10,10,10

MaxXam — A Maxxam Analytics Group Company

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-Free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 2 of 6

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	Arcadis	Quotation #:	B63225	Maxxam Job #: B697905	Bottle Order #: 560838
Attention:	Invoices Attention	Attention:	Stephanie Joyce	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:	329 Churchill Ave N Ottawa ON	Project:	Trim Road	COC #: C#560838-02-01	Project Manager: Parnian Baber
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	613-721-0555 Fax: 613-721-0229	Project Name:	450271-000		
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	Stephanie.Joyce@arcadis.com	Site #:			
				Sampled By:	S. Hanniman		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other

Special Instructions: Sample Jars incorrectly labelled as "BH" please call "TP"

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Free (WAD) Cyanide	Ba in soil	Cr in soil	Conductivity	Fraction Organic Carbon in Triplicate	V, Co in soil	Soil Texture (% sand, %silt, %clay)			# of Bottles	Comments
1		TP16-4-2	16/5/12	10:45	SOIL	N			X	X						1	Hold for analysis
2		TP16-5-1		11:00	SOIL			X		X						1	
3		G.S.-1		11:00	SOIL								X			1	
4		TP16-5-2		11:00	SOIL			X		X						1	Hold for analysis
5		TP16-7-1		11:15	SOIL			X		X						1	
6		TP16-7-2		11:15	SOIL			X		X						1	Hold for analysis
7		TP16-6-1		11:30	SOIL			X		X						1	
8		TP16-6-2		11:30	SOIL		X	X	X	X	X	X				1	
9		G.S.-2		11:30	SOIL								X			1	
10		TP16-6-3	↓	11:30	SOIL	↓		X		X						1	Hold for analysis

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Steve Hanniman	16/5/13	15:20		2016/05/13	17:20	
			Sharon TARWIN GREWAL	2016/05/14	10:04	

Laboratory Use Only: Time Sensitive: ___ Temperature (°C) on Receipt: 6,8,4,10

Custody Seal	Yes	No
Present	✓	
Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

ON ICE RECEIVED IN OTTAWA 6,10,10/10,10,10

REFER TO ACTR

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CHAIN OF CUSTODY RECORD

Page 3 of 6

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #10988 ARCADIS Canada Inc	Company Name: Arcadis	Quotation #: B63225	Maxxam Job #: B679405
Attention: Invoices Attention	Attention: Stephanie Joyce	P.O. #:	Bottle Order #: 560838
Address: 329 Churchill Ave N Suite 200, Ottawa ON K1Z 5B8	Address: 329 churchill Ave, Ottawa ON	Project: Trim Road	COC #: C#560838-03-01
Tel: (613) 721-0555 Fax: (613) 721-0029	Tel: 613-721-0555 Fax: 613-721-0029	Project Name: 60027100	Project Manager: Parnian Baber
Email: invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email: stephanie.joyce@arcadis.com	Site #:	
		Sampled By: S. Herrington	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Other ___

Special Instructions: Sample jars incorrectly labelled as "BH" please call "JP"

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☒ (will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Free (WAD) Cyanide	Ba in soil	Cr in soil	Conductivity	Fraction Organic Carbon in Triplicate	V, Co in soil	Soil Texture (% sand, %silt, %clay)	# of Bottles	Comments
1		TP16-13-1	16/5/12	12:00	Soil	N				X				1	
2		TP16-8-1		12:30						X				1	
3		TP16-9-1		12:45						X				1	
4		TP16-10-1		13:00						X				1	
5		TP16-11-1		13:15				X		X				1	
6		G.S.-3		13:15									X	1	
7		TP16-11-2		13:15				X		X				1	Hold for analysis
8		TP16-12-1		13:30				X		X				1	
9		TP16-12-2		13:30			X	X	X	X	X	X		1	
10		TP16-12-3		13:30				X		X				1	Hold for analysis

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Steve Tarighi	16/5/12	15:20		2016/5/13	17:20	
			Jaime HARWIN GIREMAL	2016/05/14	10:04	

Laboratory Use Only			
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes / No
	6,13,10	Present	✓
		Intact	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

RECEIVED IN OTTAWA ICE 10,10,10 / 10,10,10
REFER TO PCTR

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

CHAIN OF CUSTODY RECORD

Page 4 of 6

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #10988 ARCADIS Canada Inc	Company Name: Arcadis	Quotation #: B63225	Maxxam Job #: D697905 MF
Attention: Invoices Attention	Attention: Stephanie Joyce	P.O. #:	Bottle Order #: 560838
Address: 329 Churchill Ave N Suite 200, Ottawa ON K1Z 5B8	Address: 329 churchill Ave N, Ottawa ON	Project: Trim Road	COC #: C#560838-04-01
Tel: (613) 721-0555 Fax: (613) 721-0029	Tel: 613-721-0555 Fax: 613-721-0029	Project Name: 450274-000	Project Manager: Parnian Baber
Email: invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email: stephanie.joyce@arcadis.com	Site #:	
		Sampled By: S. Hannington	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☒ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☒ Table 3 ☐ Agri/Other ☒ For RSC	☐ MISA Municipality ____	
☐ Table ____	☐ PWQO	
	☐ Other ____	

Include Criteria on Certificate of Analysis (Y/N)? ____

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Free (WAD) Cyanide	Ba in soil	Cr in soil	Conductivity	Fraction Organic Carbon in Triplicate	V, Co in soil	Soil Texture (% sand, %silt, %clay)	# of Bottles	Comments
1		TP16-14-1	16/5/13	14:00	Soil	N	X							1	
2		TP16-15-1		14:30			X							1	
3		SP101		15:00			X							1	
4		SP102					X							1	
5		SP103					X							1	
6		SP104					X							1	
7		SP105					X							1	
8		SP106					X							1	
9		Dup-4					X							1	
10		Dup-5					X							1	

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Steve Hannington	16/5/13	10:00	[illegible]	2016/05/13	17:20	
			[illegible] IARWIN 4 KEIHAL	2016/05/14	10:04	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	6,13,10 / 10,10,10	Present	✓	
		Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

RECEIVED IN OTTAWA 10,10,10 REEFER TO ACTR ON ICE.

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

CHAIN OF CUSTODY RECORD

Page 5 of 6

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	Arcadis	Quotation #:	B54416	Maxxam Job #: B697905	Bottle Order #: 561532
Attention:	Invoices Attention	Attention:	Stephanie Joyce	P.O. #:			
Address:	329 Churchill Ave N Suite 200	Address:	329 Churchill Ave	Project:	160071-000	COC #: C#561532-01-01	Project Manager: Parnian Baber
	Ottawa ON K1Z 5B8		Ottawa ON	Project Name:	Tim Road		
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	613 721 0555 Fax: 613 721 0029	Site #:			
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	stephanie.joyce@arcadis.com	Sampled By:	S. Harrington		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 Petroleum Hydrocarbons (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 Volatile Organics (Soil)	O.Reg 153 OC Pesticides (Soil)	Free (WAD) Cyanide				# of Bottles	Comments
1		SP107	16/5/12	15:00	Soil	N						X				1	
2		SP108										X				1	
3		SP109										X				1	
4		SP110										X				1	
5		SP111										X				1	
6		SP112										X				1	
7		SP113										X				1	
8		SP114										X				1	
9		SP115										X				1	RECEIVED IN OTTAWA
10		SP203	16/5/13	10:00			X	X	X	X	X					7	ON ICE

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Steve Harrington	16/5/13	15:20		20/6/05/13	17:20	
			HARWIN CARTWRIGHT	2013/05/14	10:04	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	13, 6, 10	Present	✓	
		Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

10,10,10 / 10,10,10
REFER TO ALTR

Maxxam
A Bureau Veritas Group Company

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/2

CHAIN OF CUSTODY RECORD 58919 Page 6 of 6

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: Arcadis	Company Name: Arcadis	Quotation #: B54416	[X] Regular TAT (5-7 days) Most analyses
Contact Name: ~~Brian~~ Invoices	Contact Name: Steph Joyce	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 32a Churchill Ave N Ottawa	Address:	Project #: 450271-000	Rush TAT (Surcharges will be applied) [ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Phone: 6137210855 Fax: 613721-0029	Phone: Fax:	Site Location: Trim Road	
Email: invoicesottawa@arcadis.com	Email: Stephanie.joyce@arcadis.com	Site #:	Date Required:
		Sampled By: S. Harrington	Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153
[ ] Table 1 [X] Res/Park [ ] Med./ Fine
[ ] Table 2 [ ] Ind/Comm [ ] Coarse
[X] Table 3 [ ] Agri/ Other
[ ] Table ____
FOR RSC (PLEASE CIRCLE) (Y) / N

Other Regulations
[ ] CCME [ ] Sanitary Sewer Bylaw
[ ] MISA [ ] Storm Sewer Bylaw
[ ] PWQO Region ____
[ ] Other (Specify) ____
[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested (REFER TO BACK OF COC)

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Reg 153 Metals+Inorganics	O.Reg153 PHC	O.Reg153 PAH	O.Reg 153 VOC	O.Reg 153 ot Restricted				HOLD- DO NOT ANALYZE
1	Dup-6	16/5/13	12:00	So-1	7	N							X	X	X	X	X				
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

LABORATORY USE ONLY

CUSTODY SEAL (Y / N) Present	Intact	COOLER TEMPERATURES
Y	Y	10,10,10
		6,3,10
		10,10,10

COOLING MEDIA PRESENT: (Y) / N

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Steve Hamilton	16/5/13	17:20	[signature]	2016/05/13	17:20
			[signature] DARWIN GRELLA	2016/05/14	10:04

MAXXAM JOB #
RECEIVED IN: OTTAWA
B697905

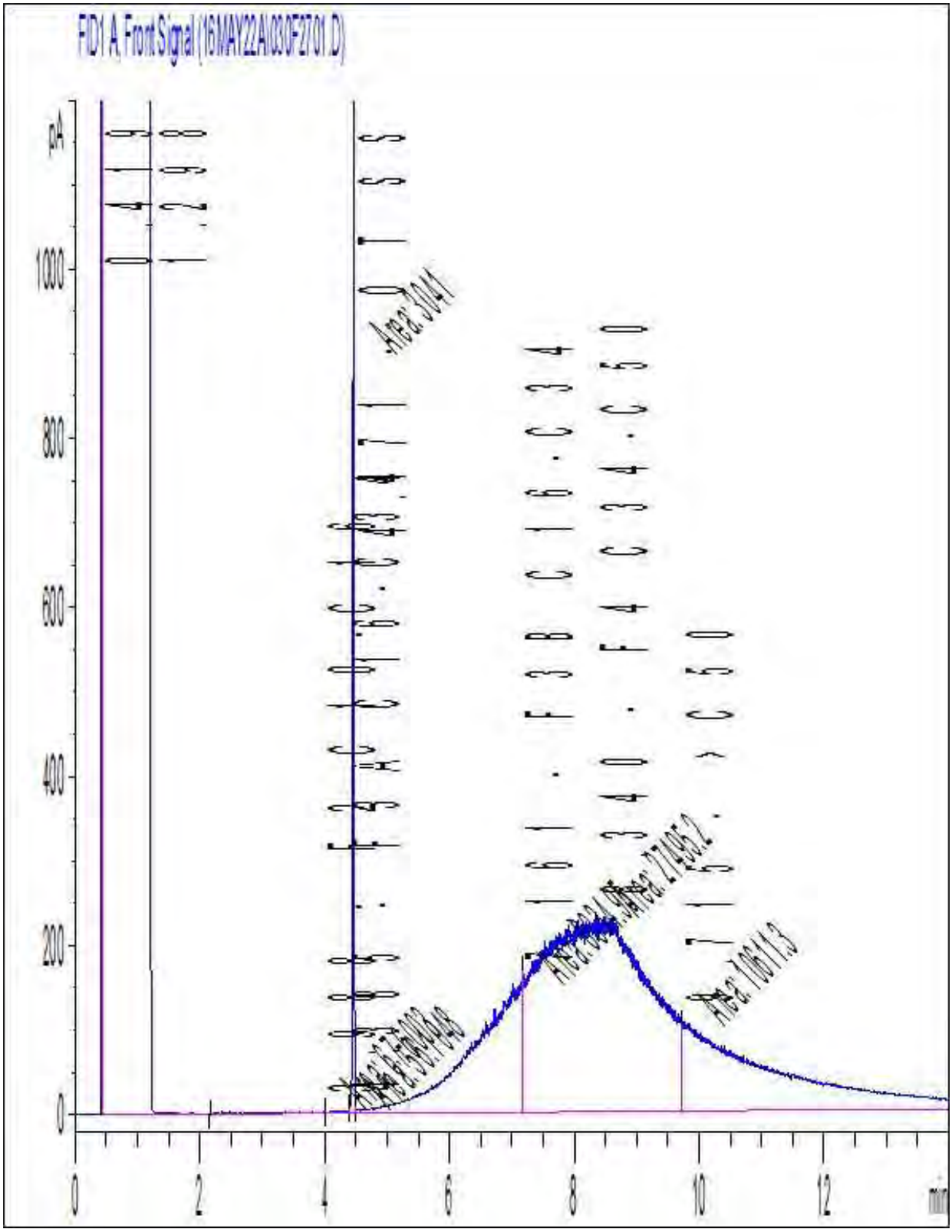
REFER TO ACTR

COC-1004 (10/14) - ENV. ENG. White: Maxxam - Yellow: Client

Maxxam Job #: B697905
Report Date: 2016/05/26
Maxxam Sample: CIZ148

ARCADIS Canada Inc
Client Project #: 450 271 000
Project name: TRIM ROAD
Client ID: SP203

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

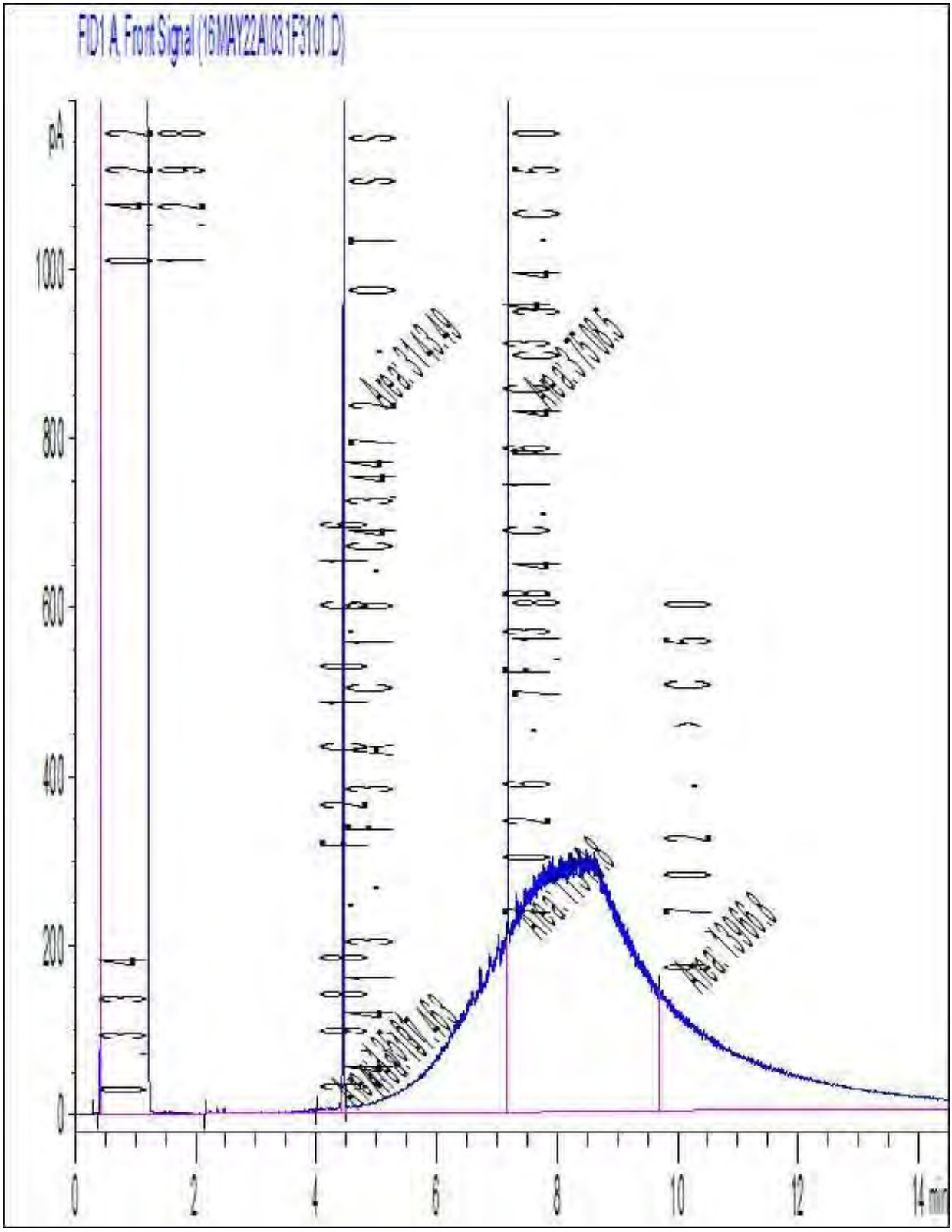


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B697905
Report Date: 2016/05/26
Maxxam Sample: CIZ150

ARCADIS Canada Inc
Client Project #: 450 271 000
Project name: TRIM ROAD
Client ID: DUP-6

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 548176-07-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/25
Report #: R3909101
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B634115
Received: 2016/02/19, 09:30

Encryption Key

Parnian Baber
Project Manager
26 Feb 2016 09:06:01 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Site Location: 1830 TRIM RD.
Your C.O.C. #: 548176-03-01, 548176-02-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/22
Report #: R3903812
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B627697
Received: 2016/02/10, 09:41

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Parnian Baber
Project Manager
22 Feb 2016 14:15:57 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 548176-04-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/03/08
Report #: R3921435
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B632361
Received: 2016/02/17, 13:50

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Parnian Baber
Project Manager
09 Mar 2016 12:11:30 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 548176-05-01, 548176-06-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/26
Report #: R3910039
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B633057
Received: 2016/02/18, 09:30

weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Parnian Baber
Project Manager
26 Feb 2016 17:42:07 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: MB697905
Site Location: 450271000

Attention:SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2016/05/25
Report #: R2185733
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B637938
Received: 2016/05/17, 08:38

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Texture by Hydrometer	3	N/A	2016/05/19	AB SOP-00035 / AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	3	N/A	2016/05/19	AB SOP-00030	Auto Calc

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Maxxam
REPORT AUTOMATION ENGINE
25 May 2016 09:37:40 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Joyce Kimani, Project Manager Assistant
Email: JKimani@maxxam.ca
Phone# (403)735-2287

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 551696-01-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/03/11
Report #: R3925495
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B646940
Received: 2016/03/08, 14:55

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Phenols (4AAP) (1)	3	N/A	2016/03/10	CAM SOP-00444	OMOE E3179 m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Parnian Baber
11 Mar 2016 11:15:59 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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Maxxam
A Bureau Veritas Group Company

Your Project #: 450 271 000
Site Location: TRIM ROAD

Attention:Stephanie Joyce

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Your C.O.C. #: 560838-01-01, 560838-02-01, 560838-03-01, 560838-04-01, 561532-01-01, 58919

Report Date: 2016/05/26
Report #: R4003859
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B697905
Received: 2016/05/13, 17:20

Encryption Key
Madison Bingley
Project Manager Assistant
26 May 2016 13:09:24 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

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Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Success Through Science

Your Project #: MB697905
Site Location: 450271000

Attention:SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2016/05/25
Report #: R2185733
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B637938
Received: 2016/05/17, 08:38

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Texture by Hydrometer	3	N/A	2016/05/19	AB SOP-00035 / AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	3	N/A	2016/05/19	AB SOP-00030	Auto Calc

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Maxxam
REPORT AUTOMATION ENGINE
25 May 2016 09:37:40 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Joyce Kimani, Project Manager Assistant
Email: JKimani@maxxam.ca
Phone# (403)735-2287

==========

This report has been generated and distributed using a secure automated process.
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Site Location: TRIM RD
Your C.O.C. #: 609845-01-01, 609845-03-01

Attention:Steven Hannington

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/05/26
Report #: R4485278
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B794804
Received: 2017/05/10, 09:50

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron (1)	2	2017/05/15	2017/05/16	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	2	N/A	2017/05/16		EPA 8260C m
Free (WAD) Cyanide (1)	5	2017/05/12	2017/05/15	CAM SOP-00457	OMOE E3015 m
Cyanide (WAD) in Leachates (1)	1	N/A	2017/05/15	CAM SOP-00457	OMOE 3015 m
Conductivity (1)	6	N/A	2017/05/16	CAM SOP-00414	OMOE E3530 v1 m
Conductivity (1)	2	2017/05/16	2017/05/16	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1, 2)	2	2017/05/15	2017/05/16	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (3)	11	N/A	2017/05/11	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (4)	11	2017/05/11	2017/05/12	OTT SOP-00001	CCME CWS
F4G (CCME Hydrocarbons Gravimetric)	1	2017/05/15	2017/05/16	OTT SOP-00001	CCME CWS
Fluoride by ISE in Leachates (1)	1	2017/05/13	2017/05/15	CAM SOP-00449	SM 22 4500-F- C m
Mercury (TCLP Leachable) (mg/L) (1)	1	N/A	2017/05/15	CAM SOP-00453	EPA 7470A m
Strong Acid Leachable Metals by ICPMS (1)	2	2017/05/15	2017/05/16	CAM SOP-00447	EPA 6020B m
Total Metals in TCLP Leachate by ICPMS (1)	1	2017/05/15	2017/05/15	CAM SOP-00447	EPA 6020B m
Ignitability of a Sample (1)	1	2017/05/15	2017/05/15	CAM SOP-00432	EPA 1030 Rev. 0 m
Moisture	11	N/A	2017/05/12	CAM SOP-00445	McKeague 2nd ed 1978
Moisture (1)	1	N/A	2017/05/17	CAM SOP-00445	Carter 2nd ed 51.2 m
Nitrate(NO3) + Nitrite(NO2) in Leachate (1)	1	N/A	2017/05/15	CAM SOP-00440	SM 22 4500-NO3I/NO2B
PAH Compounds in Leachate by GC/MS (SIM) (1)	1	2017/05/14	2017/05/15	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Leachate (1)	1	2017/05/13	2017/05/14	CAM SOP-00309	EPA 8082A m
pH CaCl2 EXTRACT (1)	2	2017/05/12	2017/05/12	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	2	N/A	2017/05/17	CAM SOP-00102	EPA 6010C
TCLP - % Solids (1)	1	2017/05/12	2017/05/13	CAM SOP-00401	EPA 1311 Update I m
TCLP - Extraction Fluid (1)	1	N/A	2017/05/13	CAM SOP-00401	EPA 1311 Update I m
TCLP - Initial and final pH (1)	1	N/A	2017/05/13	CAM SOP-00401	EPA 1311 Update I m
TCLP Zero Headspace Extraction (1)	1	2017/05/17	2017/05/18	CAM SOP-00430	EPA 1311 m
VOCs in ZHE Leachates (1)	1	2017/05/18	2017/05/18	CAM SOP-00228	EPA 8260C m
Volatile Organic Compounds in Soil (1)	2	N/A	2017/05/15	CAM SOP-00228	EPA 8260C m

Remarks:

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Your Project #: 450271-000
Site Location: TRIM RD
Your C.O.C. #: 609845-01-01, 609845-03-01

Attention:Steven Hannington

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/05/26
Report #: R4485278
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B794804
Received: 2017/05/10, 09:50

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573

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

Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		EIW952	EIW953		
Sampling Date		2017/05/09 09:30	2017/05/09 09:30		
COC Number		609845-01-01	609845-01-01		
	UNITS	**BH 17-3-2**	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters					
Sodium Adsorption Ratio	N/A	0.44	1.1		4976998
Inorganics					
Conductivity	mS/cm	0.19	0.22	0.002	4983957
Free Cyanide	ug/g	<0.01	<0.01	0.01	4981152
Available (CaCl2) pH	pH	7.06	7.43		4981034
Chromium (VI)	ug/g	0.5	0.4	0.2	4983660
Metals					
Hot Water Ext. Boron (B)	ug/g	0.15	0.11	0.050	4983685
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	0.20	4983625
Acid Extractable Arsenic (As)	ug/g	2.4	1.9	1.0	4983625
Acid Extractable Barium (Ba)	ug/g	210	190	0.50	4983625
Acid Extractable Beryllium (Be)	ug/g	1.3	0.90	0.20	4983625
Acid Extractable Boron (B)	ug/g	11	8.0	5.0	4983625
Acid Extractable Cadmium (Cd)	ug/g	0.13	0.11	0.10	4983625
Acid Extractable Chromium (Cr)	ug/g	110	100	1.0	4983625
Acid Extractable Cobalt (Co)	ug/g	24	21	0.10	4983625
Acid Extractable Copper (Cu)	ug/g	50	43	0.50	4983625
Acid Extractable Lead (Pb)	ug/g	13	9.0	1.0	4983625
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.56	0.50	4983625
Acid Extractable Nickel (Ni)	ug/g	68	59	0.50	4983625
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	0.50	4983625
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	0.20	4983625
Acid Extractable Thallium (Tl)	ug/g	0.32	0.29	0.050	4983625
Acid Extractable Uranium (U)	ug/g	1.2	0.86	0.050	4983625
Acid Extractable Vanadium (V)	ug/g	87	82	5.0	4983625
Acid Extractable Zinc (Zn)	ug/g	100	93	5.0	4983625
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	0.050	4983625

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		EIW950	EIW950	EIW951	EIW952	EIW953	EIW954		
Sampling Date		2017/05/09 08:30	2017/05/09 08:30	2017/05/09 09:00	2017/05/09 09:30	2017/05/09 09:30	2017/05/09 10:30		
COC Number		609845-01-01	609845-01-01	609845-01-01	609845-01-01	609845-01-01	609845-01-01		
	UNITS	**BH 17-9-1**	**BH 17-9-1 Lab-Dup**	**BH 17-8-2**	**BH 17-3-2**	**DUP-1**	**BH 17-5-1**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	3.7		24	24	25	22	0.2	4978866
BTEX & F1 Hydrocarbons									
Benzene	ug/g	<0.02		<0.02	<0.02	<0.02	<0.02	0.02	4975067
Toluene	ug/g	<0.02		<0.02	<0.02	<0.02	<0.02	0.02	4975067
Ethylbenzene	ug/g	<0.02		<0.02	<0.02	<0.02	<0.02	0.02	4975067
o-Xylene	ug/g	<0.02		<0.02	<0.02	<0.02	<0.02	0.02	4975067
p+m-Xylene	ug/g	<0.04		<0.04	<0.04	<0.04	<0.04	0.04	4975067
Total Xylenes	ug/g	<0.04		<0.04	<0.04	<0.04	<0.04	0.04	4975067
F1 (C6-C10)	ug/g	<10		<10	<10	<10	<10	10	4975067
F1 (C6-C10) - BTEX	ug/g	<10		<10	<10	<10	<10	10	4975067
Gasoline	ug/g						<10	10	4975067
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	<10	10	4978882
F3 (C16-C34 Hydrocarbons)	ug/g	<50		<50	<50	<50		50	4978882
F4 (C34-C50 Hydrocarbons)	ug/g	<50		<50	<50	<50		50	4978882
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes	Yes		4978882
Diesel (C10-C24)	ug/g						<10	10	4978882
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	103		101	99	102	98		4975067
4-Bromofluorobenzene	%	101		102	96	99	101		4975067
D10-Ethylbenzene	%	113		114	123	123	126		4975067
D4-1,2-Dichloroethane	%	106		105	106	107	109		4975067
o-Terphenyl	%	92	93	97	95	94	106		4978882

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		EIW958	EIW959	EIW969	EIW970	EIW971		
Sampling Date		2017/05/09 12:00	2017/05/09 12:30	2017/05/09 13:30	2017/05/09 16:00	2017/05/09 17:00		
COC Number		609845-01-01	609845-01-01	609845-03-01	609845-03-01	609845-03-01		
	UNITS	**TCLP**	**BH 17-7-1**	**BH 17-4-2**	**BH 17-1-2**	**BH 17-2-2**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	4.1	7.0	26	19	31	0.2	4978866
BTEX & F1 Hydrocarbons								
Benzene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	4975067
Toluene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	4975067
Ethylbenzene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	4975067
o-Xylene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	4975067
p+m-Xylene	ug/g	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	4975067
Total Xylenes	ug/g	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	4975067
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	4975067
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	4975067
Gasoline	ug/g	<10					10	4975067
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	4978882
F3 (C16-C34 Hydrocarbons)	ug/g		<50	<50	<50	<50	50	4978882
F4 (C34-C50 Hydrocarbons)	ug/g		<50	<50	<50	<50	50	4978882
Reached Baseline at C50	ug/g	No	Yes	Yes	Yes	Yes		4978882
Diesel (C10-C24)	ug/g	130					10	4978882
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	101	100	104	98	102		4975067
4-Bromofluorobenzene	%	98	102	100	102	100		4975067
D10-Ethylbenzene	%	119	127	128	127	115		4975067
D4-1,2-Dichloroethane	%	108	105	104	113	101		4975067
o-Terphenyl	%	89	95	96	102	98		4978882

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		EIW970	EIW971		
Sampling Date		2017/05/09 16:00	2017/05/09 17:00		
COC Number		609845-03-01	609845-03-01		
	UNITS	**BH 17-1-2**	**BH 17-2-2**	**RDL**	**QC Batch**
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	0.050	4976912
Volatile Organics					
Acetone (2-Propanone)	ug/g	<0.50	<0.50	0.50	4981112
Benzene	ug/g	<0.020	<0.020	0.020	4981112
Bromodichloromethane	ug/g	<0.050	<0.050	0.050	4981112
Bromoform	ug/g	<0.050	<0.050	0.050	4981112
Bromomethane	ug/g	<0.050	<0.050	0.050	4981112
Carbon Tetrachloride	ug/g	<0.050	<0.050	0.050	4981112
Chlorobenzene	ug/g	<0.050	<0.050	0.050	4981112
Chloroform	ug/g	<0.050	<0.050	0.050	4981112
Dibromochloromethane	ug/g	<0.050	<0.050	0.050	4981112
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4981112
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4981112
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	4981112
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	0.050	4981112
1,1-Dichloroethane	ug/g	<0.050	<0.050	0.050	4981112
1,2-Dichloroethane	ug/g	<0.050	<0.050	0.050	4981112
1,1-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4981112
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4981112
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	4981112
1,2-Dichloropropane	ug/g	<0.050	<0.050	0.050	4981112
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	0.030	4981112
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	0.040	4981112
Ethylbenzene	ug/g	<0.020	<0.020	0.020	4981112
Ethylene Dibromide	ug/g	<0.050	<0.050	0.050	4981112
Hexane	ug/g	<0.050	<0.050	0.050	4981112
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	0.050	4981112
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	0.50	4981112
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	0.50	4981112
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	0.050	4981112
Styrene	ug/g	<0.050	<0.050	0.050	4981112
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	4981112
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	4981112

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		EIW970	EIW971		
Sampling Date		2017/05/09 16:00	2017/05/09 17:00		
COC Number		609845-03-01	609845-03-01		
	UNITS	**BH 17-1-2**	**BH 17-2-2**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/g	<0.050	<0.050	0.050	4981112
Toluene	ug/g	<0.020	<0.020	0.020	4981112
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	0.050	4981112
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	0.050	4981112
Trichloroethylene	ug/g	<0.050	<0.050	0.050	4981112
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	0.050	4981112
Vinyl Chloride	ug/g	<0.020	<0.020	0.020	4981112
p+m-Xylene	ug/g	<0.020	<0.020	0.020	4981112
o-Xylene	ug/g	<0.020	<0.020	0.020	4981112
Total Xylenes	ug/g	<0.020	<0.020	0.020	4981112
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	98	98		4981112
D10-o-Xylene	%	92	93		4981112
D4-1,2-Dichloroethane	%	94	96		4981112
D8-Toluene	%	101	100		4981112

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 558 TCLP BENZO(A)PYRENE

Maxxam ID		EIW958		
Sampling Date		2017/05/09 12:00		
COC Number		609845-01-01		
	UNITS	**TCLP**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons				
Leachable Benzo(a)pyrene	ug/L	<0.10	0.10	4982835
Surrogate Recovery (%)				
Leachable D10-Anthracene	%	110		4982835
Leachable D14-Terphenyl (FS)	%	90		4982835
Leachable D8-Acenaphthylene	%	104		4982835

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 558 TCLP INORGANICS PACKAGE (SOIL)

Maxxam ID		EIW958		
Sampling Date		2017/05/09 12:00		
COC Number		609845-01-01		
	UNITS	**TCLP**	**RDL**	**QC Batch**
Inorganics				
Leachable Fluoride (F-)	mg/L	0.24	0.10	4982740
Leachable Free Cyanide	mg/L	<0.010	0.010	4982742
Leachable Nitrite (N)	mg/L	<0.10	0.10	4982744
Leachable Nitrate (N)	mg/L	<1.0	1.0	4982744
Leachable Nitrate + Nitrite (N)	mg/L	<1.0	1.0	4982744
Metals				
Leachable Mercury (Hg)	mg/L	<0.0010	0.0010	4982987
Leachable Arsenic (As)	mg/L	<0.2	0.2	4983197
Leachable Barium (Ba)	mg/L	0.8	0.2	4983197
Leachable Boron (B)	mg/L	0.1	0.1	4983197
Leachable Cadmium (Cd)	mg/L	<0.05	0.05	4983197
Leachable Chromium (Cr)	mg/L	<0.1	0.1	4983197
Leachable Lead (Pb)	mg/L	<0.1	0.1	4983197
Leachable Selenium (Se)	mg/L	<0.1	0.1	4983197
Leachable Silver (Ag)	mg/L	<0.01	0.01	4983197
Leachable Uranium (U)	mg/L	<0.01	0.01	4983197

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 558 TCLP LEACHATE PREPARATION (SOIL)

Maxxam ID		EIW958		
Sampling Date		2017/05/09 12:00		
COC Number		609845-01-01		
	UNITS	**TCLP**	**RDL**	**QC Batch**
Inorganics				
Final pH	pH	6.37		4982472
Initial pH	pH	9.44		4982472
TCLP - % Solids	%	100	0.2	4982468
TCLP Extraction Fluid	N/A	FLUID 1		4982471

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

O.REG 558 TCLP PCBS (SOIL)

Maxxam ID		EIW958		
Sampling Date		2017/05/09 12:00		
COC Number		609845-01-01		
	UNITS	**TCLP**	**RDL**	**QC Batch**
PCBs				
Leachable Total PCB	ug/L	<3.0	3.0	4982593
Surrogate Recovery (%)				
Leachable Decachlorobiphenyl	%	91		4982593

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

RESULTS OF ANALYSES OF SOIL

Maxxam ID		EIW952	EIW953	EIW954	EIW955		
Sampling Date		2017/05/09 09:30	2017/05/09 09:30	2017/05/09 10:30	2017/05/09 10:30		
COC Number		609845-01-01	609845-01-01	609845-01-01	609845-01-01		
	UNITS	**BH 17-3-2**	**DUP-1**	**BH 17-5-1**	**DUP-2**	**RDL**	**QC Batch**
Inorganics							
Conductivity	umho/cm	239	220	170		2	4985007
Free Cyanide	ug/g			<0.01	<0.01	0.01	4981152
Moisture	%				27	1.0	4987644

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		EIW956	EIW958	EIW958	EIW959	EIW969		
Sampling Date		2017/05/09 11:00	2017/05/09 12:00	2017/05/09 12:00	2017/05/09 12:30	2017/05/09 13:30		
COC Number		609845-01-01	609845-01-01	609845-01-01	609845-01-01	609845-03-01		
	UNITS	**BH-17-6-1**	**TCLP**	**TCLP Lab-Dup**	**BH 17-7-1**	**BH 17-4-2**	**RDL**	**QC Batch**
Charge/Prep Analysis								
Amount Extracted (Wet Weight) (g)	N/A		25				N/A	4987211
Inorganics								
Conductivity	umho/cm		84	85	1140	364	2	4985007
Free Cyanide	ug/g	<0.01					0.01	4981152
Moisture	%	26					0.2	4978866

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID		EIW958		
Sampling Date		2017/05/09 12:00		
COC Number		609845-01-01		
	UNITS	**TCLP**	**RDL**	**QC Batch**
Volatile Organics				
Leachable Benzene	mg/L	<0.020	0.020	4988908
Leachable Carbon Tetrachloride	mg/L	<0.020	0.020	4988908
Leachable Chlorobenzene	mg/L	<0.020	0.020	4988908
Leachable Chloroform	mg/L	<0.020	0.020	4988908
Leachable 1,2-Dichlorobenzene	mg/L	<0.050	0.050	4988908
Leachable 1,4-Dichlorobenzene	mg/L	<0.050	0.050	4988908
Leachable 1,2-Dichloroethane	mg/L	<0.050	0.050	4988908
Leachable 1,1-Dichloroethylene	mg/L	<0.020	0.020	4988908
Leachable Methylene Chloride(Dichloromethane)	mg/L	<0.20	0.20	4988908
Leachable Methyl Ethyl Ketone (2-Butanone)	mg/L	<1.0	1.0	4988908
Leachable Tetrachloroethylene	mg/L	<0.020	0.020	4988908
Leachable Trichloroethylene	mg/L	<0.020	0.020	4988908
Leachable Vinyl Chloride	mg/L	<0.020	0.020	4988908
Surrogate Recovery (%)				
Leachable 4-Bromofluorobenzene	%	97		4988908
Leachable D4-1,2-Dichloroethane	%	104		4988908
Leachable D8-Toluene	%	99		4988908

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		EIW956	EIW958		
Sampling Date		2017/05/09 11:00	2017/05/09 12:00		
COC Number		609845-01-01	609845-01-01		
	UNITS	**BH-17-6-1**	**TCLP**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons					
Benzene	ug/g	<0.02		0.02	4975067
Toluene	ug/g	<0.02		0.02	4975067
Ethylbenzene	ug/g	<0.02		0.02	4975067
o-Xylene	ug/g	<0.02		0.02	4975067
p+m-Xylene	ug/g	<0.04		0.04	4975067
Total Xylenes	ug/g	<0.04		0.04	4975067
F1 (C6-C10)	ug/g	<10		10	4975067
F1 (C6-C10) - BTEX	ug/g	<10		10	4975067
Gasoline	ug/g	<10		10	4975067
F2-F4 Hydrocarbons					
Oil & Grease Mineral/Synthetic	ug/g		11000	100	4983999
F2 (C10-C16 Hydrocarbons)	ug/g	<10		10	4978882
Reached Baseline at C50	ug/g	Yes			4978882
Diesel (C10-C24)	ug/g	<10		10	4978882
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	102			4975067
4-Bromofluorobenzene	%	97			4975067
D10-Ethylbenzene	%	129			4975067
D4-1,2-Dichloroethane	%	102			4975067
o-Terphenyl	%	106			4978882

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Sampler Initials: SH

MISCELLANEOUS (SOIL)

Maxxam ID		EIW958	
Sampling Date		2017/05/09 12:00	
COC Number		609845-01-01	
	UNITS	**TCLP**	**QC Batch**
Inorganics			
Ignitability	N/A	NF/NI	4983679
QC Batch = Quality Control Batch			

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: EIW950
Sample ID: BH 17-9-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici

Maxxam ID: EIW950 Dup
Sample ID: BH 17-9-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici

Maxxam ID: EIW951
Sample ID: BH 17-8-2
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici

Maxxam ID: EIW952
Sample ID: BH 17-3-2
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4983685	2017/05/15	2017/05/16	Jolly John
Free (WAD) Cyanide	TECH	4981152	2017/05/12	2017/05/15	Louise Harding
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar
Conductivity	AT	4983957	2017/05/16	2017/05/16	Tahir Anwar
Hexavalent Chromium in Soil by IC	IC/SPEC	4983660	2017/05/15	2017/05/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Strong Acid Leachable Metals by ICPMS	ICP/MS	4983625	2017/05/15	2017/05/16	Thao Nguyen
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4981034	2017/05/12	2017/05/12	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	4976998	N/A	2017/05/17	Automated Statchk

Maxxam ID: EIW953
Sample ID: DUP-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	4983685	2017/05/15	2017/05/16	Jolly John
Free (WAD) Cyanide	TECH	4981152	2017/05/12	2017/05/15	Louise Harding
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: EIW953
Sample ID: DUP-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4983957	2017/05/16	2017/05/16	Tahir Anwar
Hexavalent Chromium in Soil by IC	IC/SPEC	4983660	2017/05/15	2017/05/16	Sally Coughlin
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Strong Acid Leachable Metals by ICPMS	ICP/MS	4983625	2017/05/15	2017/05/16	Thao Nguyen
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici
pH CaCl2 EXTRACT	AT	4981034	2017/05/12	2017/05/12	Tahir Anwar
Sodium Adsorption Ratio (SAR)	CALC/MET	4976998	N/A	2017/05/17	Automated Statchk

Maxxam ID: EIW954
Sample ID: BH 17-5-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4981152	2017/05/12	2017/05/15	Louise Harding
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici

Maxxam ID: EIW955
Sample ID: DUP-2
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4981152	2017/05/12	2017/05/15	Louise Harding
Moisture	BAL	4987644	N/A	2017/05/17	Chun Yan

Maxxam ID: EIW956
Sample ID: BH-17-6-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	4981152	2017/05/12	2017/05/15	Louise Harding
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici

Maxxam ID: EIW958
Sample ID: TCLP
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide (WAD) in Leachates	SKAL/CN	4982742	N/A	2017/05/15	Lantian Jin
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: EIW958
Sample ID: TCLP
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
F4G (CCME Hydrocarbons Gravimetric)	BAL	4983999	2017/05/15	2017/05/16	Liliana Gaburici
Fluoride by ISE in Leachates	ISE	4982740	2017/05/13	2017/05/15	Surinder Rai
Mercury (TCLP Leachable) (mg/L)	CV/AA	4982987	N/A	2017/05/15	Ron Morrison
Total Metals in TCLP Leachate by ICPMS	ICP1/MS	4983197	2017/05/15	2017/05/15	Arefa Dabhad
Ignitability of a Sample	BAL	4983679	2017/05/15	2017/05/15	Nimarta Singh
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici
Nitrate(NO3) + Nitrite(NO2) in Leachate	LACH	4982744	N/A	2017/05/15	Chandra Nandlal
PAH Compounds in Leachate by GC/MS (SIM)	GC/MS	4982835	2017/05/14	2017/05/15	Lingyun Feng
Polychlorinated Biphenyl in Leachate	GC/ECD	4982593	2017/05/13	2017/05/14	Mahmudul Khan
TCLP - % Solids	BAL	4982468	2017/05/12	2017/05/13	Fidele Ntamwemezi
TCLP - Extraction Fluid		4982471	N/A	2017/05/13	Fidele Ntamwemezi
TCLP - Initial and final pH	PH	4982472	N/A	2017/05/13	Fidele Ntamwemezi
TCLP Zero Headspace Extraction		4987211	2017/05/17	2017/05/18	Walt Wang
VOCs in ZHE Leachates	GC/MS	4988908	2017/05/18	2017/05/18	Xueming Jiang

Maxxam ID: EIW958 Dup
Sample ID: TCLP
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar

Maxxam ID: EIW959
Sample ID: BH 17-7-1
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici

Maxxam ID: EIW969
Sample ID: BH 17-4-2
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4985007	N/A	2017/05/16	Tahir Anwar
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: EIW970
Sample ID: BH 17-1-2
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4976912	N/A	2017/05/16	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici
Volatile Organic Compounds in Soil	GC/MS	4981112	N/A	2017/05/15	Xueming Jiang

Maxxam ID: EIW971
Sample ID: BH 17-2-2
Matrix: Soil

Collected: 2017/05/09
Shipped:
Received: 2017/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4976912	N/A	2017/05/16	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4975067	N/A	2017/05/11	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4978882	2017/05/11	2017/05/12	Liliana Gaburici
Moisture	BAL	4978866	N/A	2017/05/12	Liliana Gaburici
Volatile Organic Compounds in Soil	GC/MS	4981112	N/A	2017/05/15	Xueming Jiang

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ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

GENERAL COMMENTS

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

Package 1	6.3°C

Revised Report (2017/05/26): Additional parameters have been included.

Sample EIW958 [TCLP] : NF/NI= Non Flammable and Non Ignitable.

Sample EIW970 [BH 17-1-2] : VOC Analysis: The soil samples was submitted in jars which is not consistent with Regulation 153 Protocol.

Sample EIW971 [BH 17-2-2] : VOC Analysis: The soil samples was submitted in jars which is not consistent with Regulation 153 Protocol.

Results relate only to the items tested.

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Report Date: 2017/05/26

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
4975067	1,4-Difluorobenzene	2017/05/11	102	60 - 140	103	60 - 140	104	%				
4975067	4-Bromofluorobenzene	2017/05/11	101	60 - 140	99	60 - 140	100	%				
4975067	D10-Ethylbenzene	2017/05/11	115	30 - 130	116	30 - 130	118	%				
4975067	D4-1,2-Dichloroethane	2017/05/11	102	60 - 140	103	60 - 140	105	%				
4978882	o-Terphenyl	2017/05/12	94	30 - 130	87	30 - 130	98	%				
4981112	4-Bromofluorobenzene	2017/05/15	100	60 - 140	99	60 - 140	99	%				
4981112	D10-o-Xylene	2017/05/15	111	60 - 130	105	60 - 130	92	%				
4981112	D4-1,2-Dichloroethane	2017/05/15	93	60 - 140	98	60 - 140	97	%				
4981112	D8-Toluene	2017/05/15	104	60 - 140	101	60 - 140	99	%				
4982593	Leachable Decachlorobiphenyl	2017/05/14	121	30 - 130	113	30 - 130	114	%				
4982835	Leachable D10-Anthracene	2017/05/15	110	50 - 130	111	50 - 130	112	%				
4982835	Leachable D14-Terphenyl (FS)	2017/05/15	82	50 - 130	97	50 - 130	99	%				
4982835	Leachable D8-Acenaphthylene	2017/05/15	102	50 - 130	103	50 - 130	105	%				
4988908	Leachable 4-Bromofluorobenzene	2017/05/18	98	70 - 130	98	70 - 130	98	%				
4988908	Leachable D4-1,2-Dichloroethane	2017/05/18	106	70 - 130	103	70 - 130	104	%				
4988908	Leachable D8-Toluene	2017/05/18	100	70 - 130	99	70 - 130	98	%				
4975067	Benzene	2017/05/11	88	60 - 140	85	60 - 140	<0.02	ug/g	5.1	50		
4975067	Ethylbenzene	2017/05/11	92	60 - 140	86	60 - 140	<0.02	ug/g	0.82	50		
4975067	F1 (C6-C10) - BTEX	2017/05/11					<10	ug/g	8.9	50		
4975067	F1 (C6-C10)	2017/05/11	89	60 - 140	86	80 - 120	<10	ug/g	8.1	50		
4975067	Gasoline	2017/05/11	89	60 - 140	86	60 - 140	<10	ug/g				
4975067	o-Xylene	2017/05/11	97	60 - 140	88	60 - 140	<0.02	ug/g	3.1	50		
4975067	p+m-Xylene	2017/05/11	95	60 - 140	88	60 - 140	<0.04	ug/g	0.054	50		
4975067	Toluene	2017/05/11	94	60 - 140	90	60 - 140	<0.02	ug/g	0.36	50		
4975067	Total Xylenes	2017/05/11					<0.04	ug/g	0.21	50		
4978866	Moisture	2017/05/12							4.1	50		
4978882	Diesel (C10-C24)	2017/05/12	108	50 - 130	93	80 - 120	<10	ug/g				
4978882	F2 (C10-C16 Hydrocarbons)	2017/05/12	108	50 - 130	93	80 - 120	<10	ug/g	NC	50		
4978882	F3 (C16-C34 Hydrocarbons)	2017/05/12	108	50 - 130	93	80 - 120	<50	ug/g				
4978882	F4 (C34-C50 Hydrocarbons)	2017/05/12	108	50 - 130	93	80 - 120	<50	ug/g				
4981034	Available (CaCl2) pH	2017/05/12			99	97 - 103			0.0013	N/A		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
4981112	1,1,1,2-Tetrachloroethane	2017/05/15	108	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4981112	1,1,1-Trichloroethane	2017/05/15	103	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4981112	1,1,2,2-Tetrachloroethane	2017/05/15	98	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4981112	1,1,2-Trichloroethane	2017/05/15	102	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4981112	1,1-Dichloroethane	2017/05/15	103	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4981112	1,1-Dichloroethylene	2017/05/15	108	60 - 140	104	60 - 130	<0.050	ug/g	NC	50		
4981112	1,2-Dichlorobenzene	2017/05/15	103	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4981112	1,2-Dichloroethane	2017/05/15	94	60 - 140	93	60 - 130	<0.050	ug/g	NC	50		
4981112	1,2-Dichloropropane	2017/05/15	101	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4981112	1,3-Dichlorobenzene	2017/05/15	104	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4981112	1,4-Dichlorobenzene	2017/05/15	104	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4981112	Acetone (2-Propanone)	2017/05/15	70	60 - 140	92	60 - 140	<0.50	ug/g	NC	50		
4981112	Benzene	2017/05/15	101	60 - 140	97	60 - 130	<0.020	ug/g	NC	50		
4981112	Bromodichloromethane	2017/05/15	101	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4981112	Bromoform	2017/05/15	97	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4981112	Bromomethane	2017/05/15	100	60 - 140	100	60 - 140	<0.050	ug/g	NC	50		
4981112	Carbon Tetrachloride	2017/05/15	108	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4981112	Chlorobenzene	2017/05/15	107	60 - 140	102	60 - 130	<0.050	ug/g	NC	50		
4981112	Chloroform	2017/05/15	102	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4981112	cis-1,2-Dichloroethylene	2017/05/15	106	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4981112	cis-1,3-Dichloropropene	2017/05/15	93	60 - 140	95	60 - 130	<0.030	ug/g	NC	50		
4981112	Dibromochloromethane	2017/05/15	101	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4981112	Dichlorodifluoromethane (FREON 12)	2017/05/15	77	60 - 140	79	60 - 140	<0.050	ug/g	NC	50		
4981112	Ethylbenzene	2017/05/15	108	60 - 140	101	60 - 130	<0.020	ug/g	NC	50		
4981112	Ethylene Dibromide	2017/05/15	97	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4981112	Hexane	2017/05/15	112	60 - 140	107	60 - 130	<0.050	ug/g	NC	50		
4981112	Methyl Ethyl Ketone (2-Butanone)	2017/05/15	76	60 - 140	96	60 - 140	<0.50	ug/g	NC	50		
4981112	Methyl Isobutyl Ketone	2017/05/15	84	60 - 140	96	60 - 130	<0.50	ug/g	NC	50		
4981112	Methyl t-butyl ether (MTBE)	2017/05/15	96	60 - 140	95	60 - 130	<0.050	ug/g	NC	50		
4981112	Methylene Chloride(Dichloromethane)	2017/05/15	102	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4981112	o-Xylene	2017/05/15	104	60 - 140	97	60 - 130	<0.020	ug/g	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
4981112	p+m-Xylene	2017/05/15	105	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
4981112	Styrene	2017/05/15	101	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4981112	Tetrachloroethylene	2017/05/15	110	60 - 140	102	60 - 130	<0.050	ug/g	NC	50		
4981112	Toluene	2017/05/15	105	60 - 140	99	60 - 130	<0.020	ug/g	NC	50		
4981112	Total Xylenes	2017/05/15					<0.020	ug/g	NC	50		
4981112	trans-1,2-Dichloroethylene	2017/05/15	104	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4981112	trans-1,3-Dichloropropene	2017/05/15	94	60 - 140	97	60 - 130	<0.040	ug/g	NC	50		
4981112	Trichloroethylene	2017/05/15	103	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4981112	Trichlorofluoromethane (FREON 11)	2017/05/15	110	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4981112	Vinyl Chloride	2017/05/15	99	60 - 140	97	60 - 130	<0.020	ug/g	NC	50		
4981152	Free Cyanide	2017/05/15	96	75 - 125	99	80 - 120	<0.01	ug/g	NC	35		
4982593	Leachable Total PCB	2017/05/14	105	30 - 130	108	30 - 130	<3.0	ug/L	NC	40		
4982740	Leachable Fluoride (F-)	2017/05/15	98	80 - 120	103	80 - 120	<0.10	mg/L	3.8	25	<0.10	mg/L
4982742	Leachable Free Cyanide	2017/05/15	81	80 - 120	99	80 - 120	<0.0020	mg/L	NC (1)	20	<0.010	mg/L
4982744	Leachable Nitrate (N)	2017/05/15	96	80 - 120	101	80 - 120	<1.0	mg/L	NC	25	<1.0	mg/L
4982744	Leachable Nitrate + Nitrite (N)	2017/05/15	96	80 - 120	100	80 - 120	<1.0	mg/L	NC	25	<1.0	mg/L
4982744	Leachable Nitrite (N)	2017/05/15	99	80 - 120	97	80 - 120	<0.10	mg/L	NC	25	<0.10	mg/L
4982835	Leachable Benzo(a)pyrene	2017/05/15	90	50 - 130	89	50 - 130	<0.10	ug/L	NC	40		
4982987	Leachable Mercury (Hg)	2017/05/15	103	75 - 125	100	80 - 120	<0.0010	mg/L	NC	25	<0.0010	mg/L
4983197	Leachable Arsenic (As)	2017/05/15	94	80 - 120	93	80 - 120			NC	35	<0.2	mg/L
4983197	Leachable Barium (Ba)	2017/05/15	100	80 - 120	96	80 - 120			0.21	35	<0.2	mg/L
4983197	Leachable Boron (B)	2017/05/15	99	80 - 120	94	80 - 120			NC	35	<0.1	mg/L
4983197	Leachable Cadmium (Cd)	2017/05/15	95	80 - 120	95	80 - 120			NC	35	<0.05	mg/L
4983197	Leachable Chromium (Cr)	2017/05/15	93	80 - 120	92	80 - 120			NC	35	<0.1	mg/L
4983197	Leachable Lead (Pb)	2017/05/15	90	80 - 120	91	80 - 120			NC	35	<0.1	mg/L
4983197	Leachable Selenium (Se)	2017/05/15	96	80 - 120	94	80 - 120			NC	35	<0.1	mg/L
4983197	Leachable Silver (Ag)	2017/05/15	88	80 - 120	89	80 - 120			NC	35	<0.01	mg/L
4983197	Leachable Uranium (U)	2017/05/15	93	80 - 120	92	80 - 120			NC	35	<0.01	mg/L
4983625	Acid Extractable Antimony (Sb)	2017/05/16	89	75 - 125	100	80 - 120	<0.20	ug/g	NC	30		
4983625	Acid Extractable Arsenic (As)	2017/05/16	98	75 - 125	103	80 - 120	<1.0	ug/g	16	30		
4983625	Acid Extractable Barium (Ba)	2017/05/16	NC	75 - 125	104	80 - 120	<0.50	ug/g	2.0	30		

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Maxxam Job #: B794804
Report Date: 2017/05/26

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
4983625	Acid Extractable Beryllium (Be)	2017/05/16	106	75 - 125	105	80 - 120	<0.20	ug/g	4.8	30		
4983625	Acid Extractable Boron (B)	2017/05/16	98	75 - 125	103	80 - 120	<5.0	ug/g	9.9	30		
4983625	Acid Extractable Cadmium (Cd)	2017/05/16	103	75 - 125	104	80 - 120	<0.10	ug/g	23	30		
4983625	Acid Extractable Chromium (Cr)	2017/05/16	101	75 - 125	102	80 - 120	<1.0	ug/g	1.2	30		
4983625	Acid Extractable Cobalt (Co)	2017/05/16	104	75 - 125	102	80 - 120	<0.10	ug/g	0.91	30		
4983625	Acid Extractable Copper (Cu)	2017/05/16	103	75 - 125	105	80 - 120	<0.50	ug/g	0.97	30		
4983625	Acid Extractable Lead (Pb)	2017/05/16	NC	75 - 125	104	80 - 120	<1.0	ug/g	5.2	30		
4983625	Acid Extractable Mercury (Hg)	2017/05/16	105	75 - 125	108	80 - 120	<0.050	ug/g	NC	30		
4983625	Acid Extractable Molybdenum (Mo)	2017/05/16	103	75 - 125	102	80 - 120	<0.50	ug/g	NC	30		
4983625	Acid Extractable Nickel (Ni)	2017/05/16	104	75 - 125	102	80 - 120	<0.50	ug/g	1.2	30		
4983625	Acid Extractable Selenium (Se)	2017/05/16	101	75 - 125	105	80 - 120	<0.50	ug/g	NC	30		
4983625	Acid Extractable Silver (Ag)	2017/05/16	104	75 - 125	104	80 - 120	<0.20	ug/g	NC	30		
4983625	Acid Extractable Thallium (Tl)	2017/05/16	101	75 - 125	104	80 - 120	<0.050	ug/g	14	30		
4983625	Acid Extractable Uranium (U)	2017/05/16	103	75 - 125	104	80 - 120	<0.050	ug/g	3.8	30		
4983625	Acid Extractable Vanadium (V)	2017/05/16	NC	75 - 125	101	80 - 120	<5.0	ug/g	1.5	30		
4983625	Acid Extractable Zinc (Zn)	2017/05/16	NC	75 - 125	100	80 - 120	<5.0	ug/g	3.1	30		
4983660	Chromium (VI)	2017/05/16	35 (2)	75 - 125	96	80 - 120	<0.2	ug/g	NC	35		
4983685	Hot Water Ext. Boron (B)	2017/05/15	101	75 - 125	101	75 - 125	<0.050	ug/g	12	40		
4983957	Conductivity	2017/05/16			99	90 - 110	<0.002	mS/cm	0.38	10		
4983999	Oil & Grease Mineral/Synthetic	2017/05/16			103	65 - 135	<100	ug/g	0.97	50		
4985007	Conductivity	2017/05/16			100	90 - 110	<2	umho/cm	0.72	10		
4987644	Moisture	2017/05/17							2.4	20		
4988908	Leachable 1,1-Dichloroethylene	2017/05/18	107	70 - 130	104	70 - 130	<0.020	mg/L	NC	30		
4988908	Leachable 1,2-Dichlorobenzene	2017/05/18	101	70 - 130	98	70 - 130	<0.050	mg/L	NC	30		
4988908	Leachable 1,2-Dichloroethane	2017/05/18	104	70 - 130	98	70 - 130	<0.050	mg/L	NC	30		
4988908	Leachable 1,4-Dichlorobenzene	2017/05/18	102	70 - 130	100	70 - 130	<0.050	mg/L	NC	30		
4988908	Leachable Benzene	2017/05/18	102	70 - 130	99	70 - 130	<0.020	mg/L	NC	30		
4988908	Leachable Carbon Tetrachloride	2017/05/18	103	70 - 130	101	70 - 130	<0.020	mg/L	NC	30		
4988908	Leachable Chlorobenzene	2017/05/18	102	70 - 130	99	70 - 130	<0.020	mg/L	NC	30		
4988908	Leachable Chloroform	2017/05/18	102	70 - 130	99	70 - 130	<0.020	mg/L	NC	30		

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Maxxam Job #: B794804
Report Date: 2017/05/26

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
4988908	Leachable Methyl Ethyl Ketone (2-Butanone)	2017/05/18	124	60 - 140	118	60 - 140	<1.0	mg/L	NC	30		
4988908	Leachable Methylene Chloride(Dichloromethane)	2017/05/18	97	70 - 130	93	70 - 130	<0.20	mg/L	NC	30		
4988908	Leachable Tetrachloroethylene	2017/05/18	97	70 - 130	95	70 - 130	<0.020	mg/L	NC	30		
4988908	Leachable Trichloroethylene	2017/05/18	98	70 - 130	96	70 - 130	<0.020	mg/L	NC	30		
4988908	Leachable Vinyl Chloride	2017/05/18	108	70 - 130	104	70 - 130	<0.020	mg/L	NC	30		

N/A = Not Applicable

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

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

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

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

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

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

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

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

(1) Detection Limit was raised due to matrix interferences.

(2) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The matrix spike was reanalyzed to confirm result.

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Maxxam Job #: B794804
Report Date: 2017/05/26

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD
Sampler Initials: SH

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Scientific Services

Paul Rubinato, Analyst, Maxxam Analytics

Steve Roberts, Ottawa Lab Manager

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

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32 Colonnade Unit 1000, Nepean, Ontario Canada K2E 7J6 Tel:(613) 274-0573 Toll-free:800-563-6266 Fax:(613) 274-0574 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 2

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	Same	Quotation #:	B54416	Maxxam Job #:	Bottle Order #: 609845
Attention:	Invoices Attention	Attention:	Steven Hannington	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:	Stephanie.Joyce@arcadis.com	Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Project Name:	Tom Rd	C#609845-01-01	Alison Cameron
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	steven.hannington@arcadis.com	Site #:			
				Sampled By:	S. Hannington		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☒ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☒ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): O.Reg 153 Petroleum Hydrocarbons (Soil)	O.Reg 153 VOCs by HS (Soil)	O.Reg 153 Metals & Inorganics Pkg (Soil) incl. Hg, Cr^{6+}	Free (WAD) Cyanide	Electrical Conductivity	TCLP - Nitrogen Metals	BTEX and F_1 - F_2 only				# of Bottles	Comments
1		BH17-9-1	17/5/9	8:30	Soil	N	X										3	
2		BH17-8-2		9:00			X										3	
3		BH17-3-2		9:30			X		X		X						5	
4		Dup-1		9:30			X		X		X						5	
5		BH17-5-1		10:30						X	X		X				4	no F_3 or F_4
6		Dup-2		10:30						X							1	
7		BH17-6-1		11:00						X			X				4	no F_3 or F_4
8		BH17-6-3		11:00						X			X				4	Hold, no F_3 or F_4
9		TCLP		12:00								X					6	
10		BH17-7-1		12:30			X				X						4	ON ICE

10-May-17 09:50
Alison Cameron
B794804

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Steve Hannington	17/5/9	18:00	Kevin Jacyszczak	2017/05/10	9:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	6, 6, 7	Present	X	
		Intact	X	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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CHAIN OF CUSTODY RECORD

Page 2 of 2

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	Same	Quotation #:	B54416	Maxxam Job #:	Bottle Order #:
Attention:	Invoices Attention	Attention:	Steven Hannington	P.O. #:			609845
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:	stephanie.joyce@arcadis.com	Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Project Name:	Trim Rd	C#609845-03-01	Alison Cameron
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	steven.hannington@arcadis.com	Site #:			
				Sampled By:	S. Hennighty		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☒ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☒ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	O.Reg 153 Petroleum Hydrocarbons (Soil)	O.Reg 153 VOCs by HS (Soil)	O.Reg 153 Metals & Inorganics Pkg (Soil)	Free (WAD) Cyanide	electrical Conductivity	# of Bottles	Comments
1		BH17-4-2	17/5/9	1:30	Soil	N	X			X	4	
2		BH17-1-2	↓	16:00	↓	↓	X	X			4	
3		BH17-2-2	↓	17:00	↓	↓	X	X			4	
4												
5												
6												
7												
8												
9												
10												

10-May-17 09:50
Alison Cameron
B794804
KIV OTT-001

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ON Ice

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Steve Hannington	17/5/9	16:00	Kevin Jenkins	2017/05/10	9:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	6,6,7	Present		
		Intact	X	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

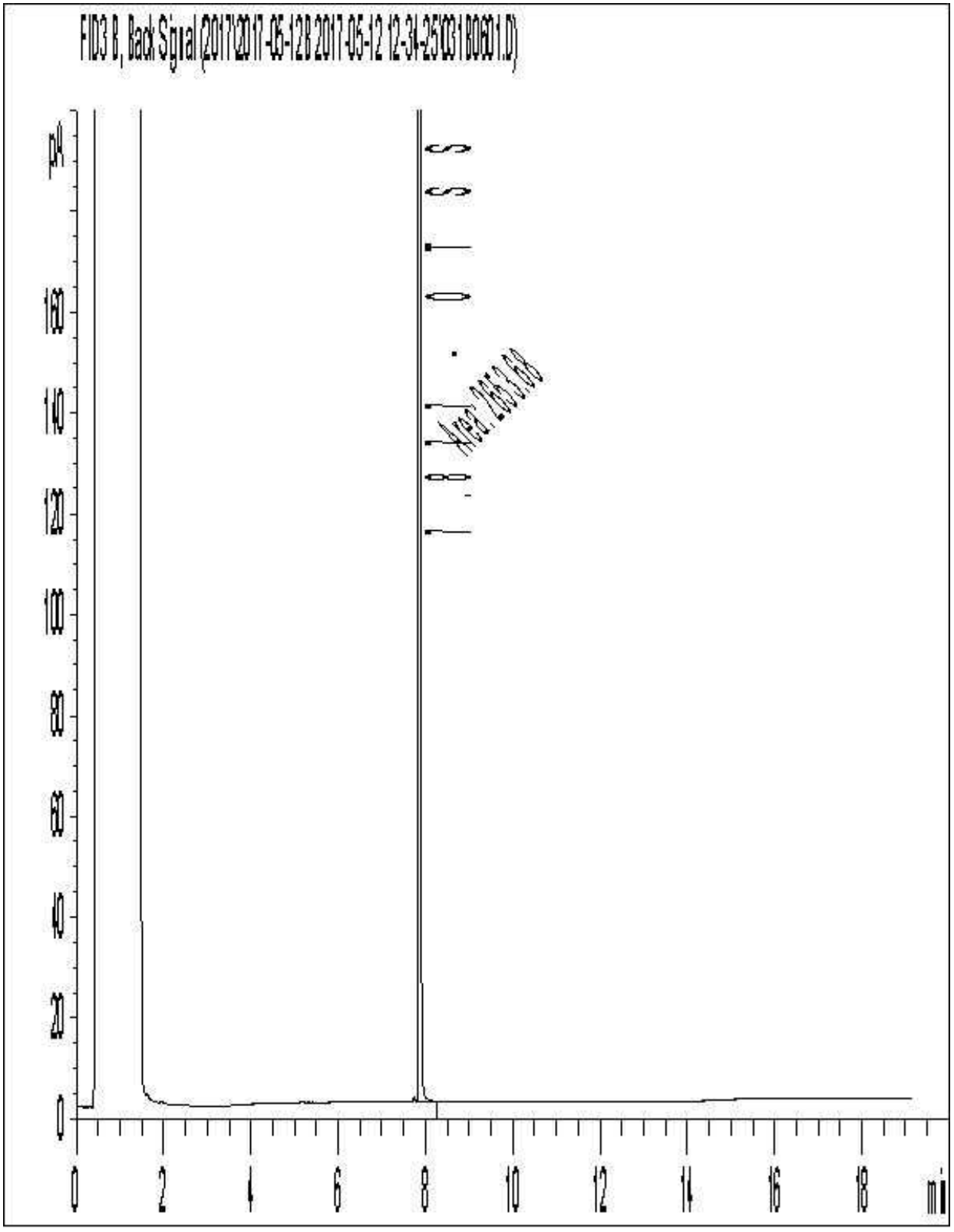
White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW950

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-9-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

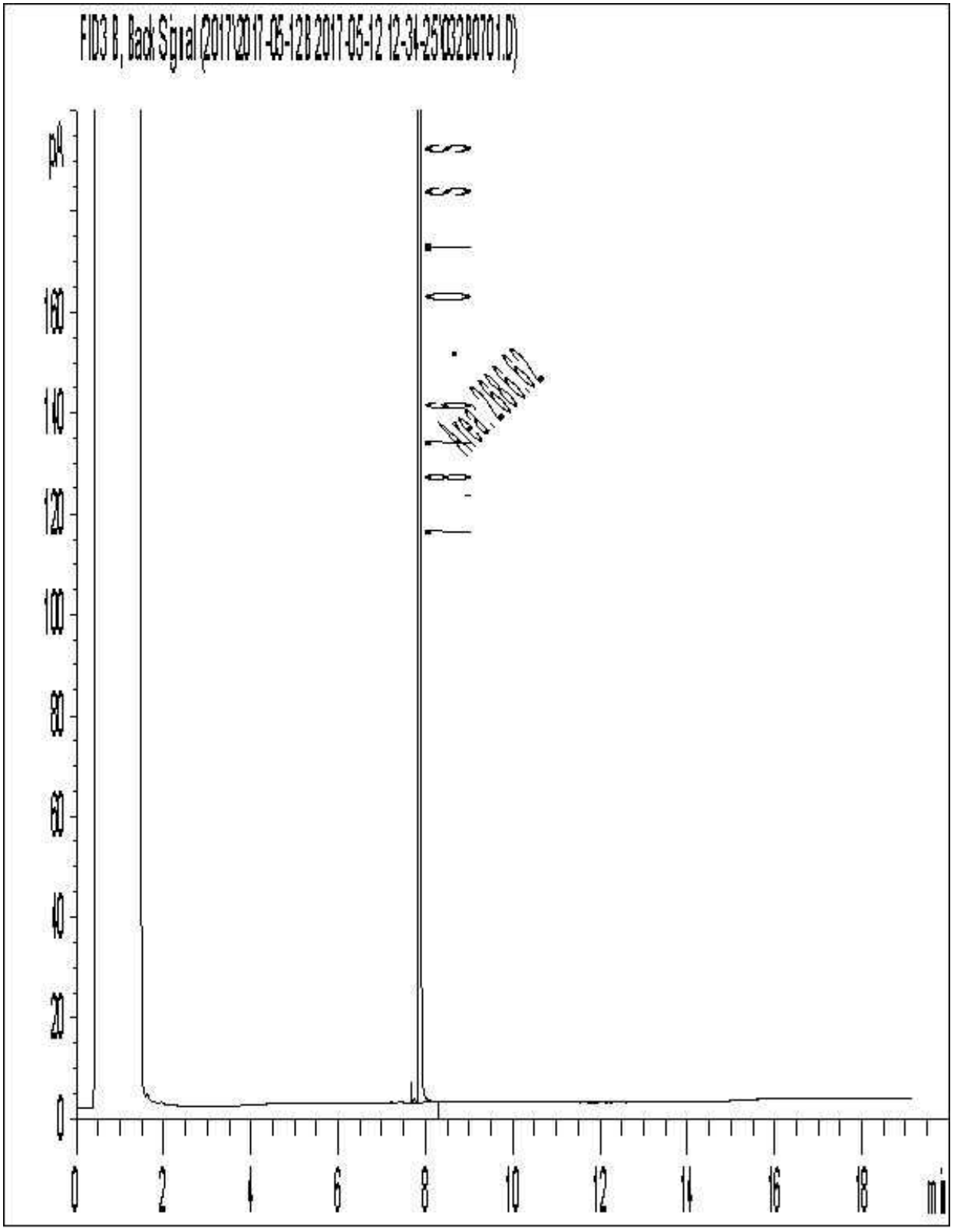


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW950 Lab-Dup

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-9-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

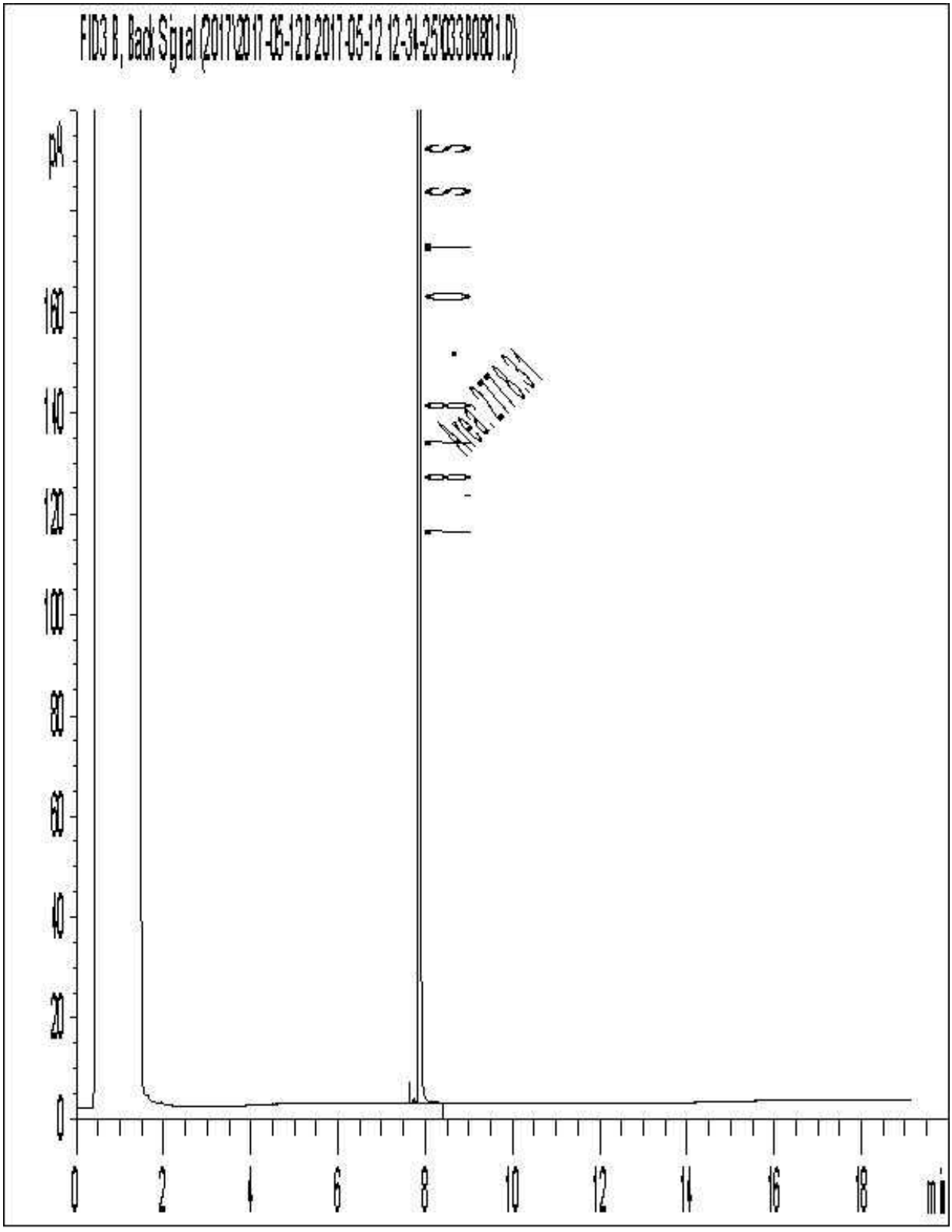


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW951

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-8-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

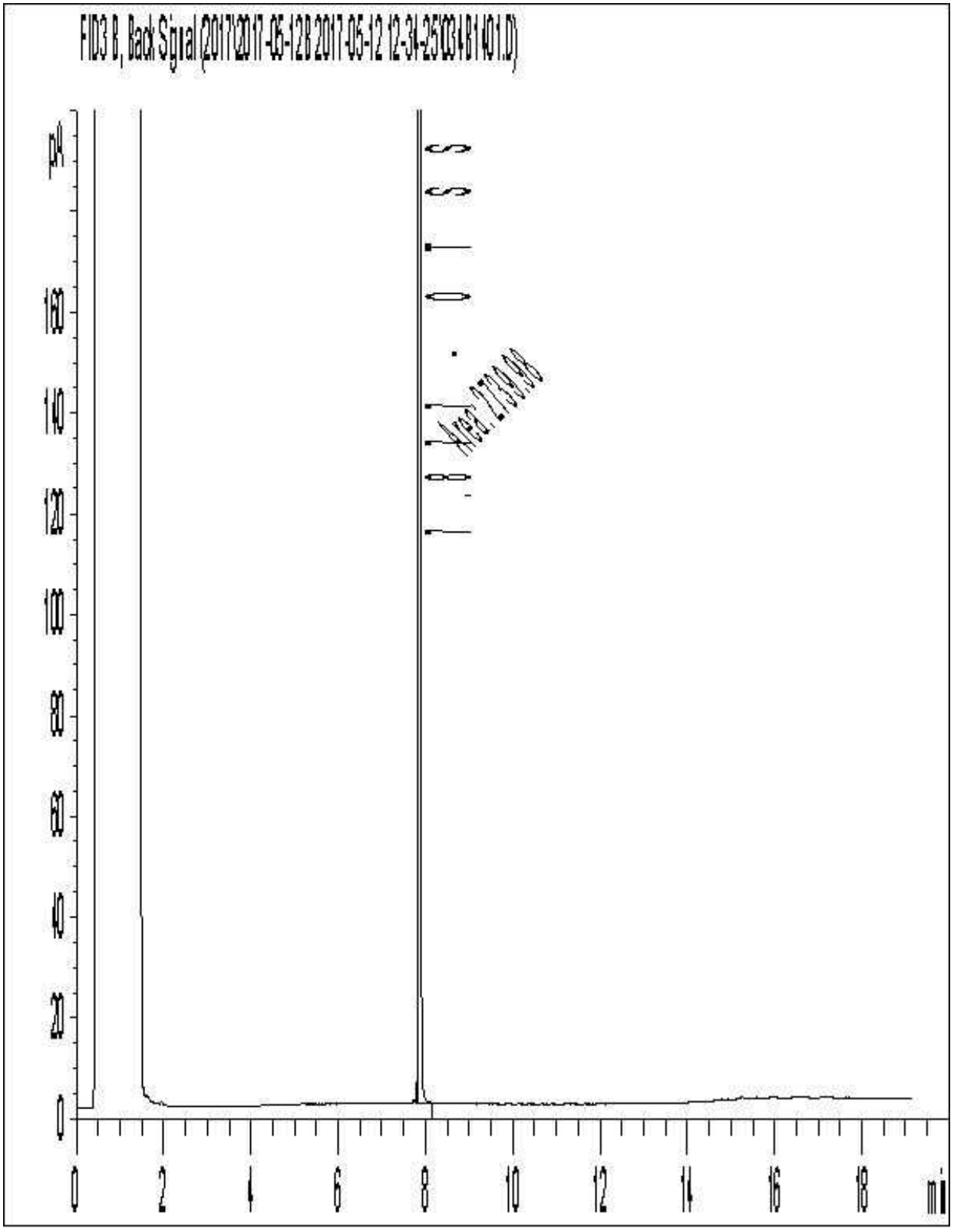


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW952

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-3-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

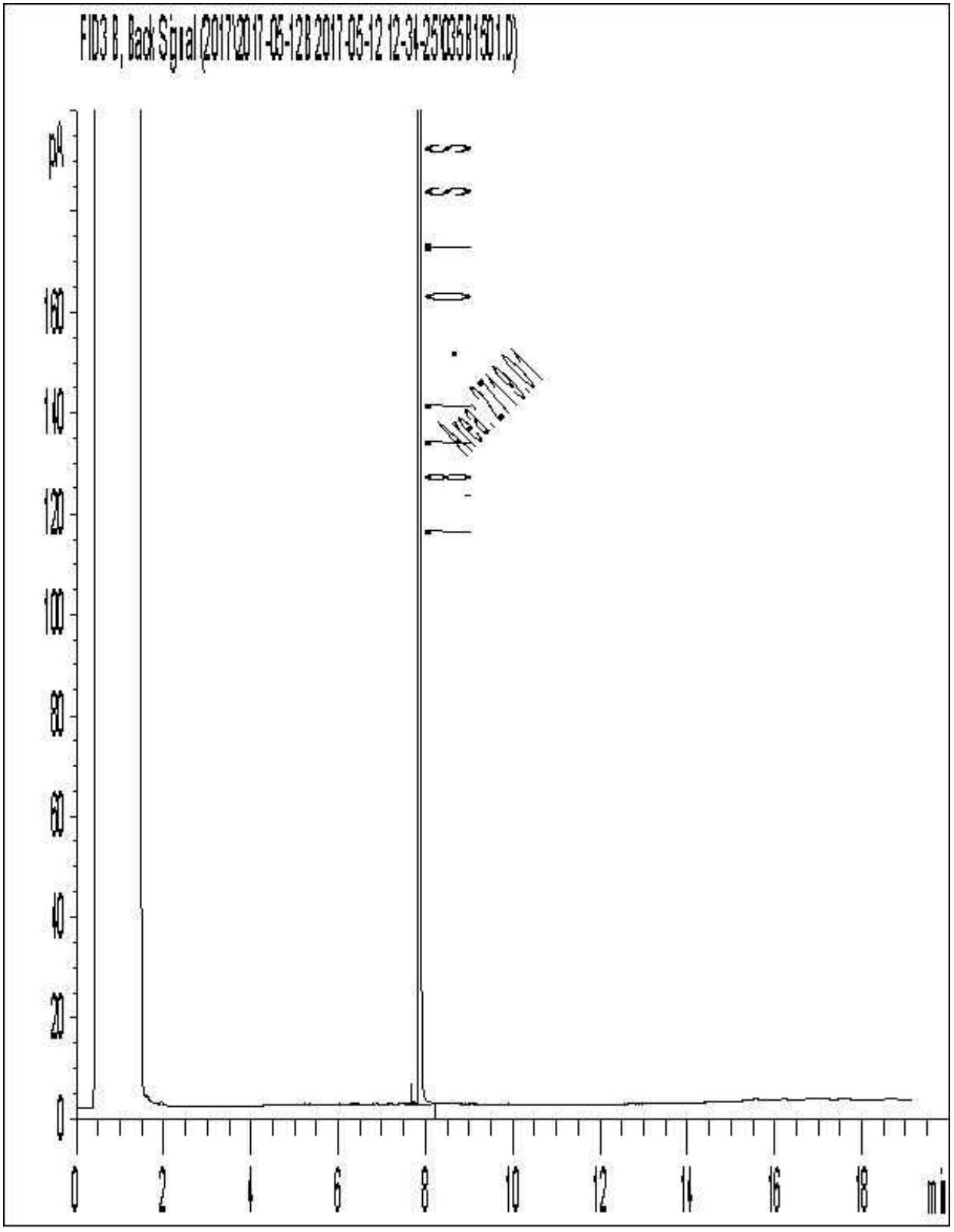


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW953

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: DUP-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

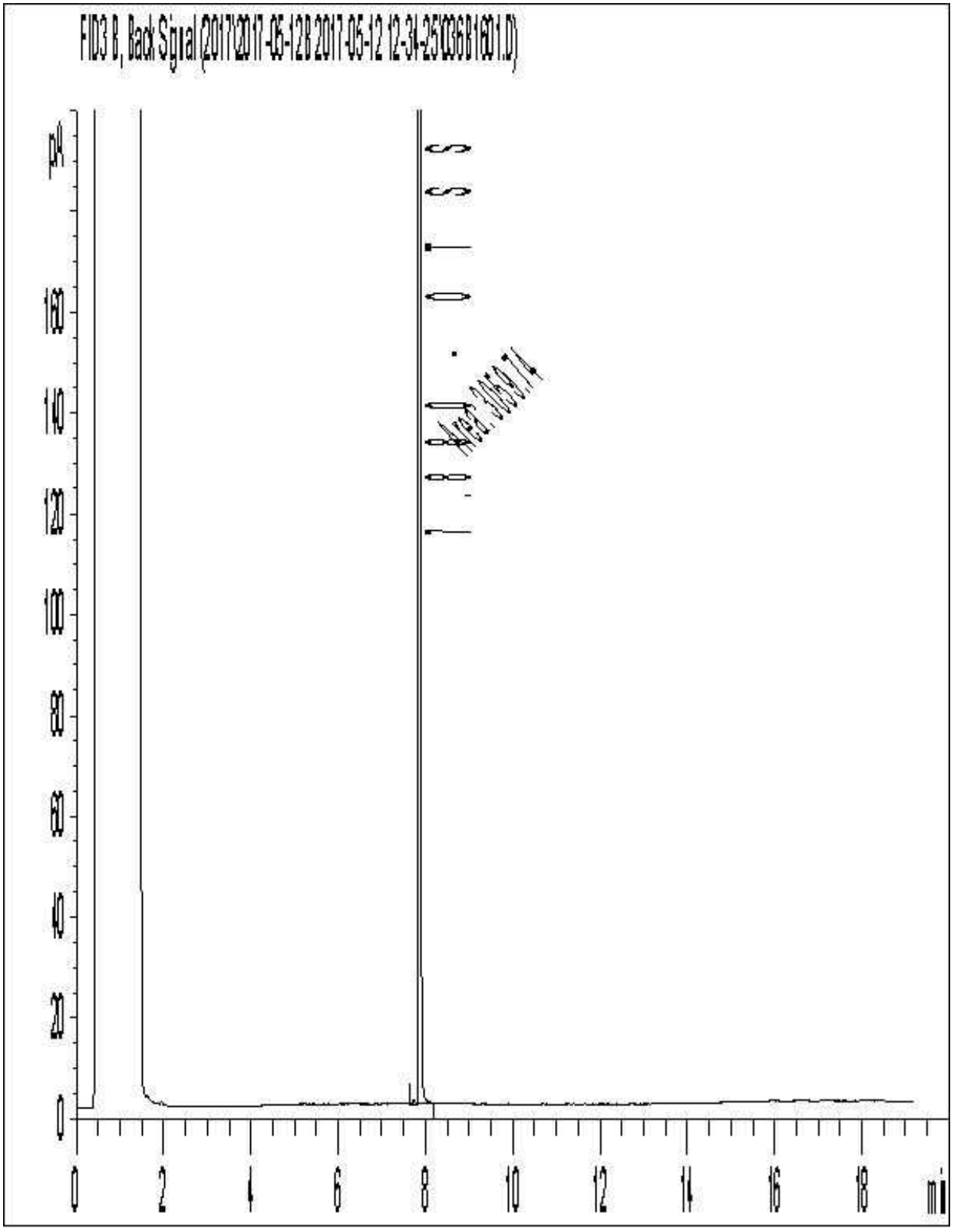


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW954

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-5-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

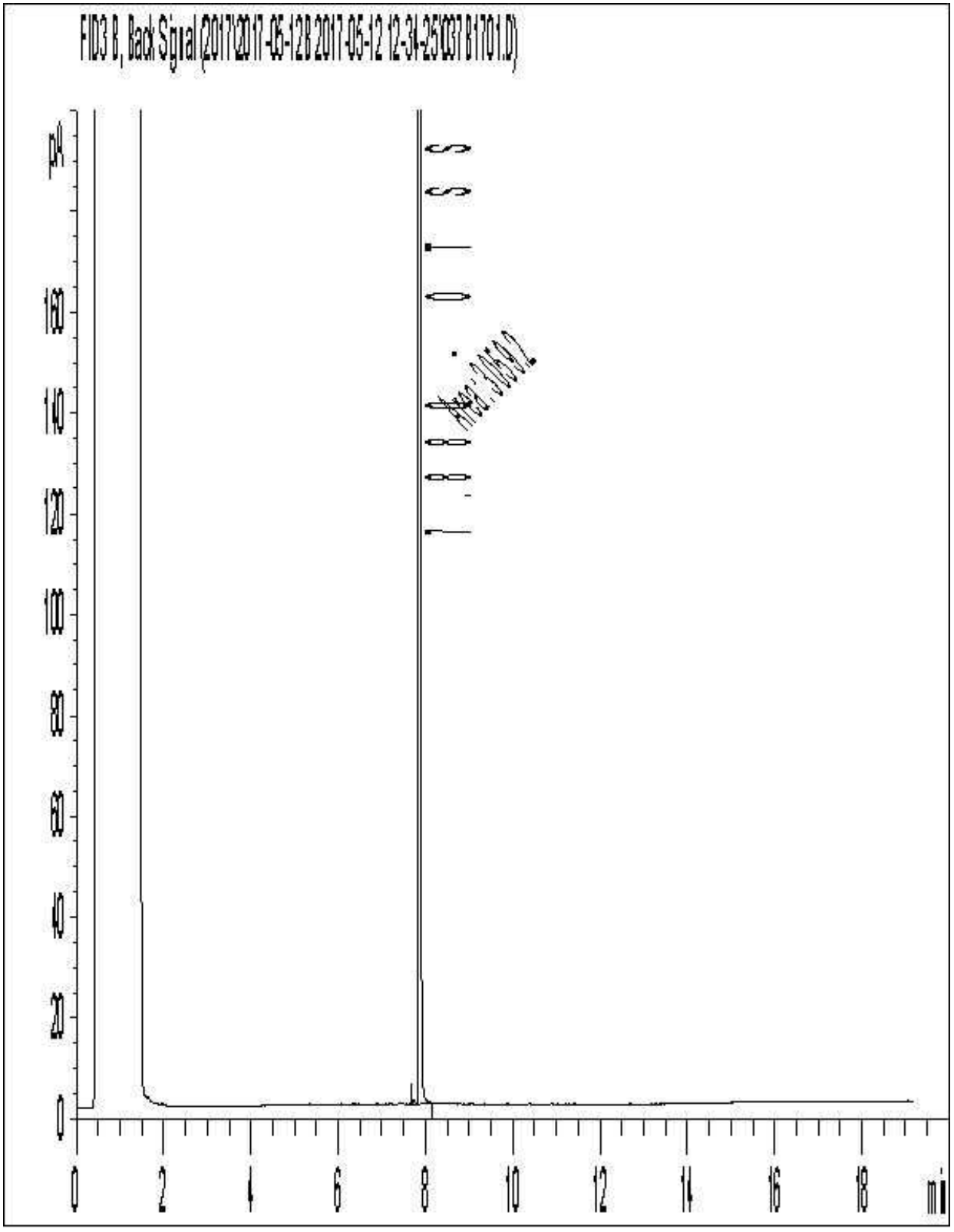


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW956

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH-17-6-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

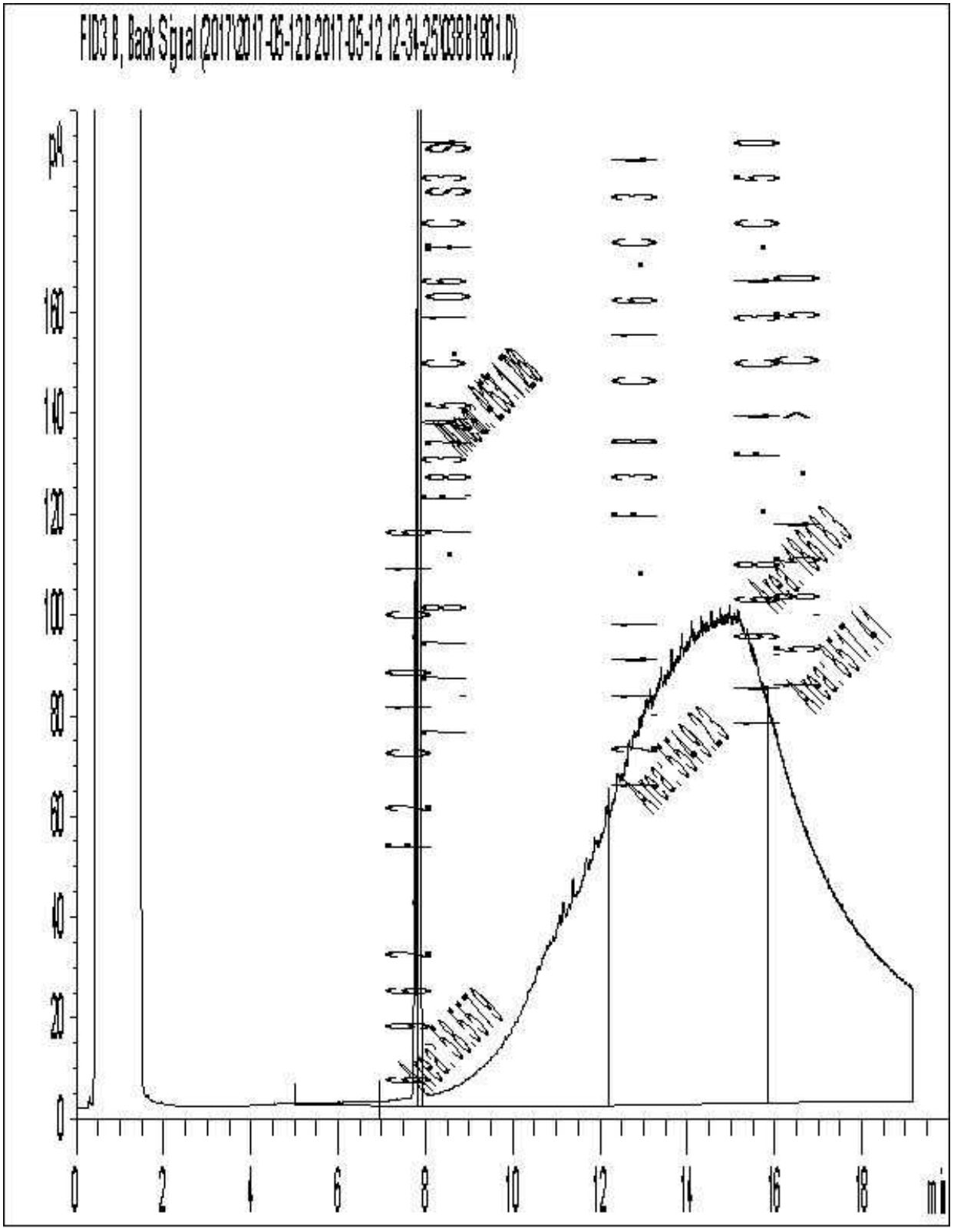


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW958

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: TCLP

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

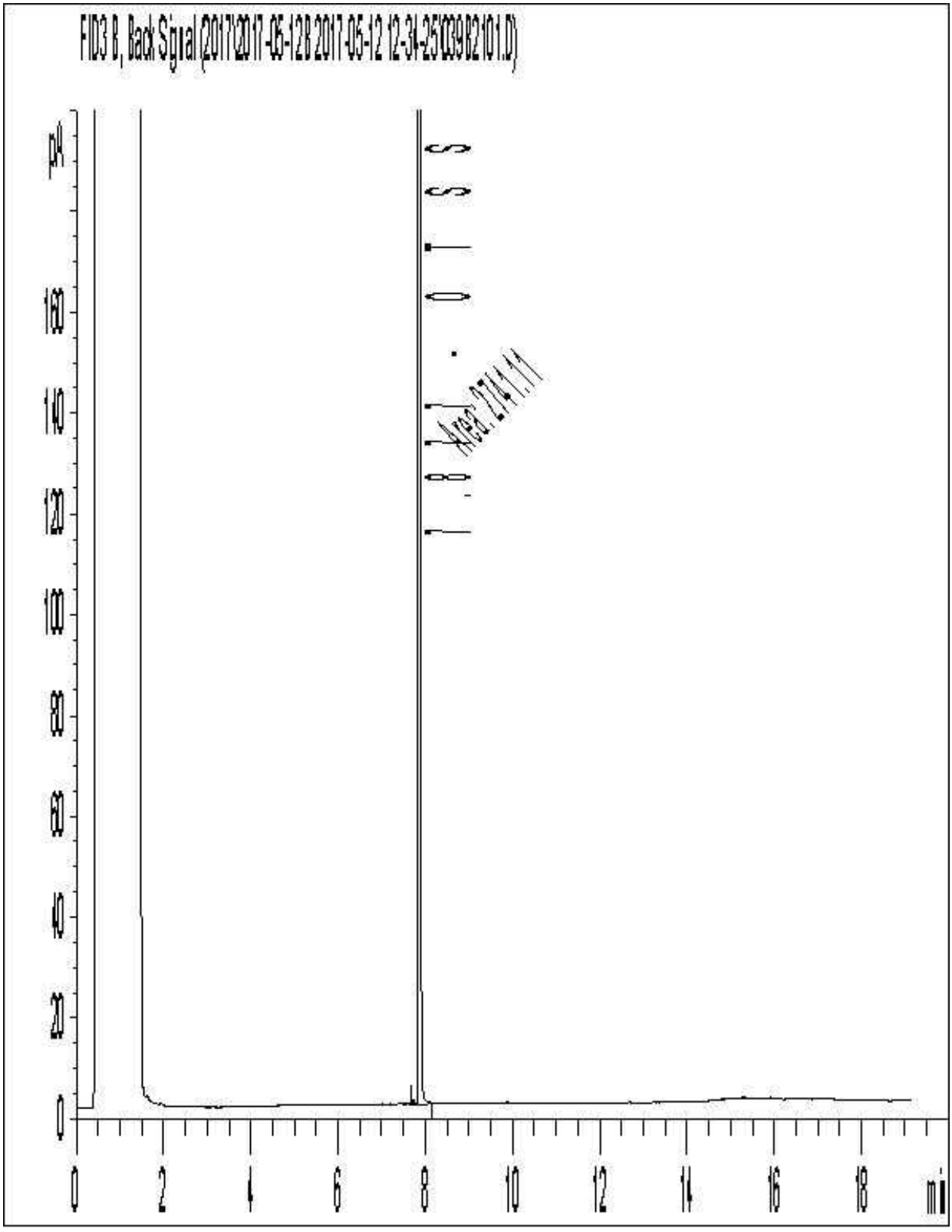


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW959

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-7-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

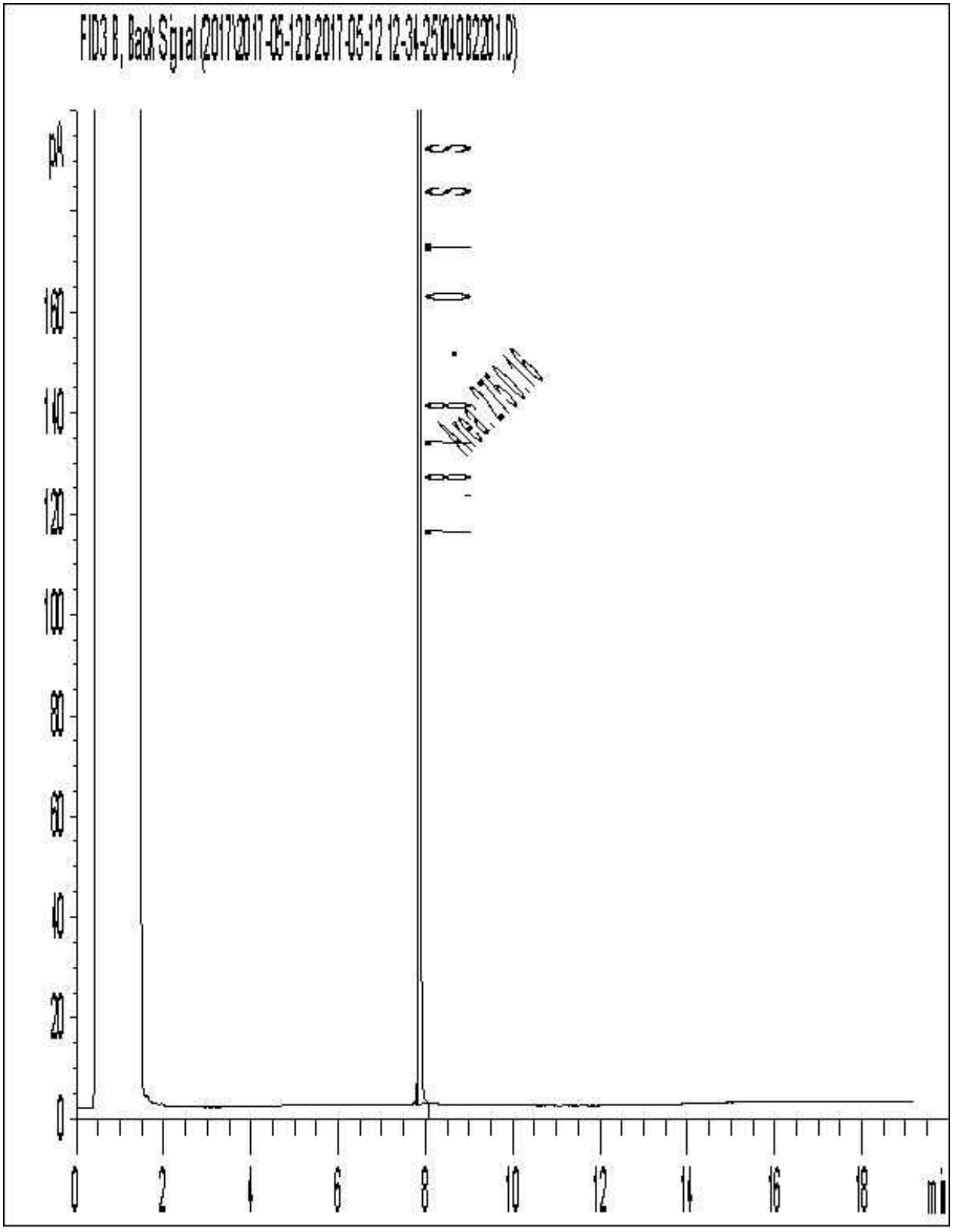


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW969

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-4-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

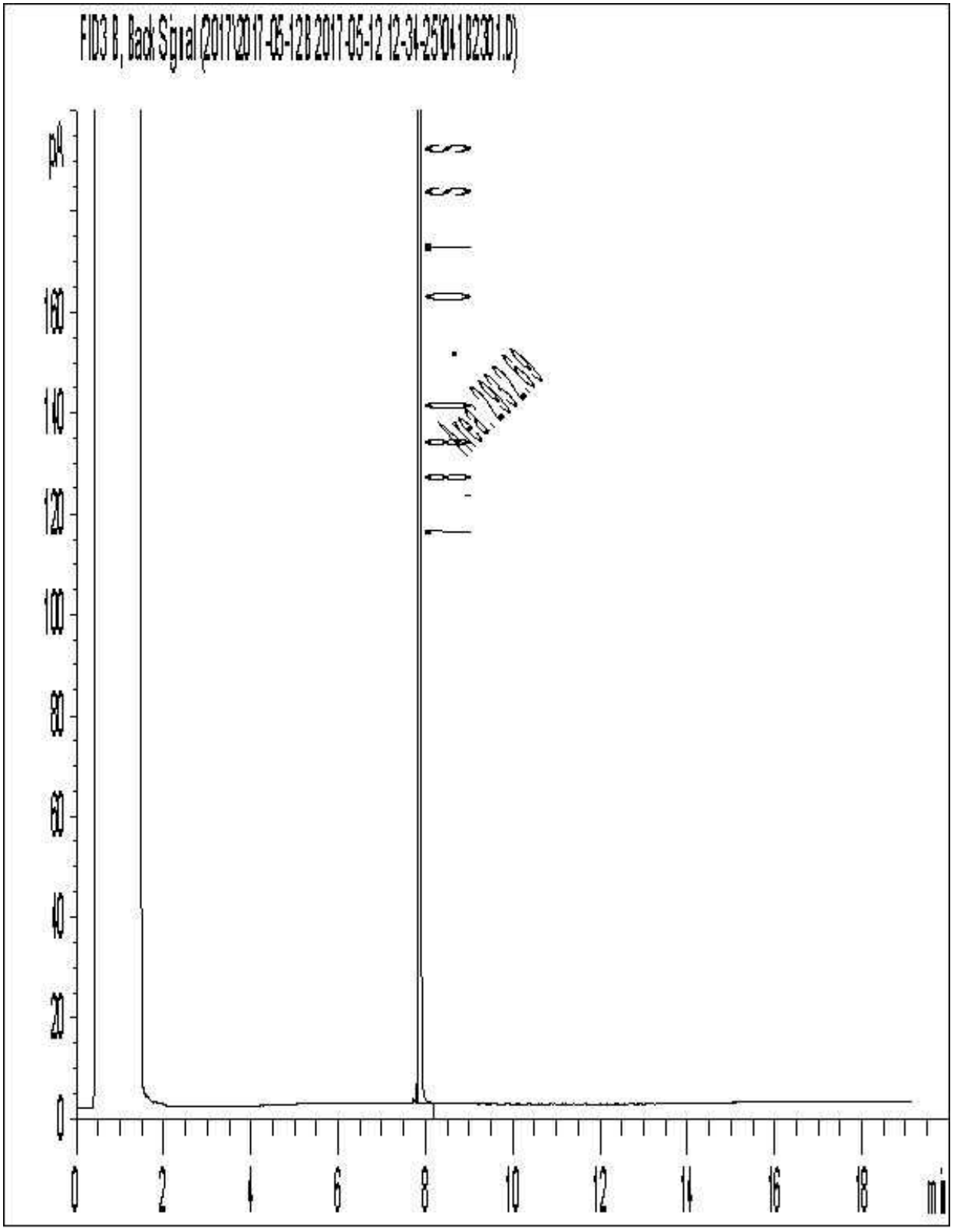


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW970

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-1-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

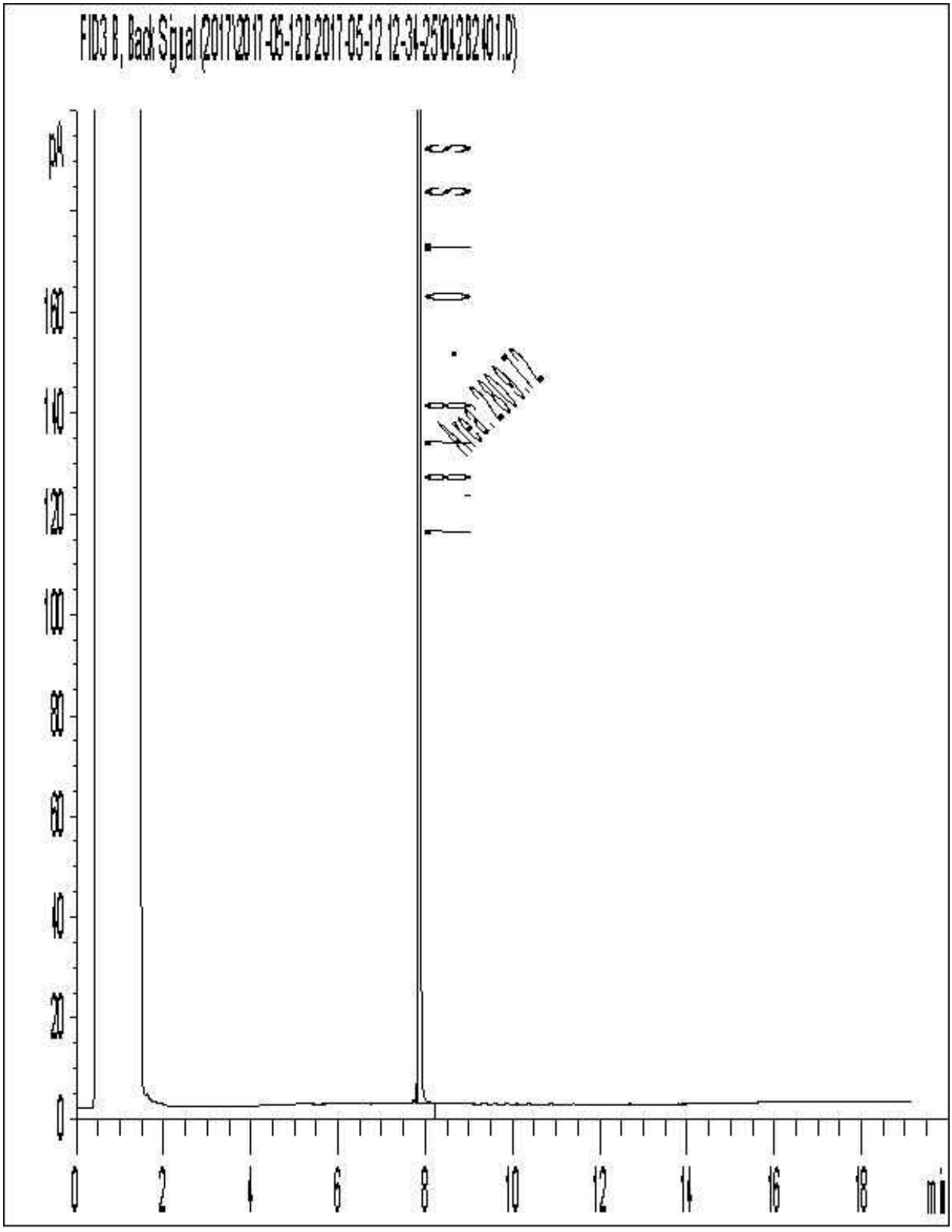


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B794804
Report Date: 2017/05/26
Maxxam Sample: EIW971

ARCADIS Canada Inc
Client Project #: 450271-000
Project name: TRIM RD
Client ID: BH 17-2-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Your Project #: 450271-000
Site Location: TRIM RD, OTTAWA
Your C.O.C. #: 102829

Attention: Troy Austrins

ARCADIS Canada Inc
1050 Morrison Drive
Unit 201
Ottawa, ON
K2H 8K7

Report Date: 2018/05/09
Report #: R5117216
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8A4764
Received: 2018/05/04, 16:55

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Strong Acid Leachable Metals by ICPMS (1)	4	2018/05/08	2018/05/08	CAM SOP-00447	EPA 6020B m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Jonathan Urben, Senior Project Manager
Email: jurben@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B8A4764
Report Date: 2018/05/09

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD, OTTAWA
Sampler Initials: LD

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		GPW734	GPW735	GPW736	GPW737		
Sampling Date		2018/03/13 09:00	2018/03/13 09:30	2018/03/13 09:45	2018/03/13 10:00		
COC Number		102829	102829	102829	102829		
	UNITS	**BH18-1-2**	**BH18-2-2**	**BH18-3-2**	**BH18-4-2**	**RDL**	**QC Batch**
Metals							
Acid Extractable Vanadium (V)	ug/g	100	110	110	100	5.0	5520260

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8A4764
Report Date: 2018/05/09

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD, OTTAWA
Sampler Initials: LD

TEST SUMMARY

Maxxam ID: GPW734 **Collected:** 2018/03/13
Sample ID: BH18-1-2 **Shipped:**
Matrix: Soil **Received:** 2018/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5520260	2018/05/08	2018/05/08	Daniel Teclu

Maxxam ID: GPW735 **Collected:** 2018/03/13
Sample ID: BH18-2-2 **Shipped:**
Matrix: Soil **Received:** 2018/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5520260	2018/05/08	2018/05/08	Daniel Teclu

Maxxam ID: GPW736 **Collected:** 2018/03/13
Sample ID: BH18-3-2 **Shipped:**
Matrix: Soil **Received:** 2018/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5520260	2018/05/08	2018/05/08	Daniel Teclu

Maxxam ID: GPW737 **Collected:** 2018/03/13
Sample ID: BH18-4-2 **Shipped:**
Matrix: Soil **Received:** 2018/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5520260	2018/05/08	2018/05/08	Daniel Teclu

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8A4764
Report Date: 2018/05/09

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD, OTTAWA
Sampler Initials: LD

GENERAL COMMENTS

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

Package 1	9.0°C

Cooler custody seal was present and intact.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8A4764
Report Date: 2018/05/09

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD, OTTAWA
Sampler Initials: LD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5520260	Acid Extractable Vanadium (V)	2018/05/08	NC	75 - 125	102	80 - 120	<5.0	ug/g	1.3	30

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

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

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

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

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8A4764
Report Date: 2018/05/09

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: TRIM RD, OTTAWA
Sampler Initials: LD

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD 102829

Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: Arcadis Canada	Company Name:	Quotation #:	[X] Regular TAT (5-7 days) Most analyses
Contact Name: Troy Austins	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 1050 morrison Dr. OTTAWA	Address:	Project #: 450 271-000	Rush TAT (Surcharges will be applied)
Phone: Fax:	Phone: Fax:	Site Location: Trim Rd. OTT.	[ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Email: Troy.austins@arcadis.com	Email:	Site #:	Date Required:
		Sampled By: Lennart de Groot	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153
[ ] Table 1 [ ] Res/Park [ ] Med/ Fine
[ ] Table 2 [ ] Ind/Comm [ ] Coarse
[ ] Table 3 [ ] Agri/ Other
[ ] Table ____
FOR RSC (PLEASE CIRCLE) Y / N

Other Regulations
[ ] CCME [ ] Sanitary Sewer Bylaw
[ ] MISA [ ] Storm Sewer Bylaw
[ ] PWQO Region
[ ] Other (Specify)
[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Rush Confirmation #:

LABORATORY USE ONLY
CUSTODY SEAL Y / N
COOLER TEMPERATURES: Present / Intact: Y / Y — 9, 9, 9 — 4 | 6 | 4
COOLING MEDIA PRESENT: Y / N

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Vanadium								HOLD - DO NOT ANALYZE
1	BH18-1-2	2018-03-3	9:00	S	1								X								
2	BH18-2-2	"	9:30	S	1								X								
3	BH18-3-2	"	9:45	S	1								X								
4	BH18-4-2	"	10:00	S	1								X								
5																					
6																					
7																					
8																					
9																					
10																					

04-May-18 16:55
Jonathan Urben
B8A4764
URE ENV-409

RECEIVED IN OTTAWA ON Sue.

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
Lennart de Groot	2018-05-4	16:55	[illegible]	2018/05/04	16:55	
			Rajed PARAMJEET SINGH	2018/05/05	09:35	

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

White: Maxxam ~ Yellow: Client

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Site Location: 1830 TRIM RD
Your C.O.C. #: 675490-01-01

Attention: Troy Austrins

ARCADIS Canada Inc
1050 Morrison Drive
Unit 201
Ottawa, ON
CANADA K2H 8K7

Report Date: 2018/08/07
Report #: R5344301
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8J1488
Received: 2018/07/27, 17:43

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron (1)	4	2018/08/02	2018/08/02	CAM SOP-00408	R153 Ana. Prot. 2011
Free (WAD) Cyanide (1)	4	2018/08/02	2018/08/03	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	4	2018/08/02	2018/08/02	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1, 2)	4	2018/07/31	2018/08/03	CAM SOP-00436	EPA 3060/7199 m
Strong Acid Leachable Metals by ICPMS (1)	4	2018/08/02	2018/08/03	CAM SOP-00447	EPA 6020B m
Moisture (1)	4	N/A	2018/08/01	CAM SOP-00445	Carter 2nd ed 51.2 m
pH CaCl2 EXTRACT (1)	4	2018/08/01	2018/08/01	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	4	N/A	2018/08/03	CAM SOP-00102	EPA 6010C

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.

Your Project #: 450271-000
Site Location: 1830 TRIM RD
Your C.O.C. #: 675490-01-01

Attention: Troy Austrins

ARCADIS Canada Inc
1050 Morrison Drive
Unit 201
Ottawa, ON
CANADA K2H 8K7

Report Date: 2018/08/07
Report #: R5344301
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8J1488
Received: 2018/07/27, 17:43

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Jonathan Urben, Senior Project Manager
Email: jurben@maxxam.ca
Phone# (613) 274-0573
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8J1488
Report Date: 2018/08/07

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		HIO523			HIO523			HIO525		
Sampling Date		2018/07/27 08:30			2018/07/27 08:30			2018/07/27 14:30		
COC Number		675490-01-01			675490-01-01			675490-01-01		
	UNITS	**BH18-8-1**	**RDL**	**QC Batch**	**BH18-8-1 Lab-Dup**	**RDL**	**QC Batch**	**BH18-9-1**	**RDL**	**QC Batch**
Calculated Parameters										
Sodium Adsorption Ratio	N/A	3.9		5653480				6.5		5653480
Inorganics										
Conductivity	mS/cm	0.39	0.002	5660717				0.36	0.002	5660717
Moisture	%	44	1.0	5658857	43	1.0	5658857	43	1.0	5658857
Available (CaCl2) pH	pH	8.44		5658853				8.46		5658853
WAD Cyanide (Free)	ug/g	<0.01	0.01	5661111				<0.01	0.01	5661111
Chromium (VI)	ug/g	<0.2	0.2	5657647				<0.2	0.2	5657647
Metals										
Hot Water Ext. Boron (B)	ug/g	1.2	0.050	5660639				0.98	0.050	5660639
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	5660612				<0.20	0.20	5660612
Acid Extractable Arsenic (As)	ug/g	1.6	1.0	5660612				1.2	1.0	5660612
Acid Extractable Barium (Ba)	ug/g	290	0.50	5660612				300	0.50	5660612
Acid Extractable Beryllium (Be)	ug/g	0.89	0.20	5660612				0.80	0.20	5660612
Acid Extractable Boron (B)	ug/g	11	5.0	5660612				8.6	5.0	5660612
Acid Extractable Cadmium (Cd)	ug/g	0.14	0.10	5660612				0.16	0.10	5660612
Acid Extractable Chromium (Cr)	ug/g	120	1.0	5660612				120	1.0	5660612
Acid Extractable Cobalt (Co)	ug/g	25	0.10	5660612				24	0.10	5660612
Acid Extractable Copper (Cu)	ug/g	51	0.50	5660612				51	0.50	5660612
Acid Extractable Lead (Pb)	ug/g	8.9	1.0	5660612				7.9	1.0	5660612
Acid Extractable Molybdenum (Mo)	ug/g	1.0	0.50	5660612				0.93	0.50	5660612
Acid Extractable Nickel (Ni)	ug/g	70	0.50	5660612				69	0.50	5660612
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	5660612				<0.50	0.50	5660612
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	5660612				<0.20	0.20	5660612
Acid Extractable Thallium (Tl)	ug/g	0.42	0.050	5660612				0.42	0.050	5660612
Acid Extractable Uranium (U)	ug/g	2.0	0.050	5660612				1.8	0.050	5660612
Acid Extractable Vanadium (V)	ug/g	100	5.0	5660612				110	5.0	5660612
Acid Extractable Zinc (Zn)	ug/g	130	5.0	5660612				130	5.0	5660612
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	5660612				<0.050	0.050	5660612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8J1488
Report Date: 2018/08/07

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		HIO527	HIO528		
Sampling Date		2018/07/27 15:30	2018/07/27 15:30		
COC Number		675490-01-01	675490-01-01		
	UNITS	**BH18-10-1**	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters					
Sodium Adsorption Ratio	N/A	5.8	5.8		5653480
Inorganics					
Conductivity	mS/cm	0.33	0.34	0.002	5660717
Moisture	%	43	45	1.0	5658857
Available (CaCl2) pH	pH	8.48	8.51		5658853
WAD Cyanide (Free)	ug/g	<0.01	<0.01	0.01	5661111
Chromium (VI)	ug/g	<0.2	<0.2	0.2	5657647
Metals					
Hot Water Ext. Boron (B)	ug/g	1.1	1.2	0.050	5660639
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	0.20	5660612
Acid Extractable Arsenic (As)	ug/g	1.2	1.4	1.0	5660612
Acid Extractable Barium (Ba)	ug/g	290	280	0.50	5660612
Acid Extractable Beryllium (Be)	ug/g	0.79	0.82	0.20	5660612
Acid Extractable Boron (B)	ug/g	9.1	9.0	5.0	5660612
Acid Extractable Cadmium (Cd)	ug/g	0.12	0.13	0.10	5660612
Acid Extractable Chromium (Cr)	ug/g	140	140	1.0	5660612
Acid Extractable Cobalt (Co)	ug/g	26	25	0.10	5660612
Acid Extractable Copper (Cu)	ug/g	55	55	0.50	5660612
Acid Extractable Lead (Pb)	ug/g	8.5	8.8	1.0	5660612
Acid Extractable Molybdenum (Mo)	ug/g	0.86	0.92	0.50	5660612
Acid Extractable Nickel (Ni)	ug/g	78	76	0.50	5660612
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	0.50	5660612
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	0.20	5660612
Acid Extractable Thallium (Tl)	ug/g	0.44	0.42	0.050	5660612
Acid Extractable Uranium (U)	ug/g	1.3	1.4	0.050	5660612
Acid Extractable Vanadium (V)	ug/g	110	110	5.0	5660612
Acid Extractable Zinc (Zn)	ug/g	130	130	5.0	5660612
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	0.050	5660612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8J1488
Report Date: 2018/08/07

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: HIO523
Sample ID: BH18-8-1
Matrix: Soil

Collected: 2018/07/27
Shipped:
Received: 2018/07/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5660639	2018/08/02	2018/08/02	Jolly John
Free (WAD) Cyanide	TECH	5661111	2018/08/02	2018/08/03	Louise Harding
Conductivity	AT	5660717	2018/08/02	2018/08/02	Tahir Anwar
Hexavalent Chromium in Soil by IC	IC/SPEC	5657647	2018/07/31	2018/08/03	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5660612	2018/08/02	2018/08/03	Daniel Teclu
Moisture	BAL	5658857	N/A	2018/08/01	Prgya Panchal
pH CaCl2 EXTRACT	AT	5658853	2018/08/01	2018/08/01	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5653480	N/A	2018/08/03	Automated Statchk

Maxxam ID: HIO523 Dup
Sample ID: BH18-8-1
Matrix: Soil

Collected: 2018/07/27
Shipped:
Received: 2018/07/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5658857	N/A	2018/08/01	Prgya Panchal

Maxxam ID: HIO525
Sample ID: BH18-9-1
Matrix: Soil

Collected: 2018/07/27
Shipped:
Received: 2018/07/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5660639	2018/08/02	2018/08/02	Jolly John
Free (WAD) Cyanide	TECH	5661111	2018/08/02	2018/08/03	Louise Harding
Conductivity	AT	5660717	2018/08/02	2018/08/02	Tahir Anwar
Hexavalent Chromium in Soil by IC	IC/SPEC	5657647	2018/07/31	2018/08/03	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5660612	2018/08/02	2018/08/03	Daniel Teclu
Moisture	BAL	5658857	N/A	2018/08/01	Prgya Panchal
pH CaCl2 EXTRACT	AT	5658853	2018/08/01	2018/08/01	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5653480	N/A	2018/08/03	Automated Statchk

Maxxam ID: HIO527
Sample ID: BH18-10-1
Matrix: Soil

Collected: 2018/07/27
Shipped:
Received: 2018/07/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5660639	2018/08/02	2018/08/02	Jolly John
Free (WAD) Cyanide	TECH	5661111	2018/08/02	2018/08/03	Louise Harding
Conductivity	AT	5660717	2018/08/02	2018/08/02	Tahir Anwar
Hexavalent Chromium in Soil by IC	IC/SPEC	5657647	2018/07/31	2018/08/03	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5660612	2018/08/02	2018/08/03	Daniel Teclu
Moisture	BAL	5658857	N/A	2018/08/01	Prgya Panchal
pH CaCl2 EXTRACT	AT	5658853	2018/08/01	2018/08/01	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5653480	N/A	2018/08/03	Automated Statchk

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Maxxam Job #: B8J1488
Report Date: 2018/08/07

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: HIO528
Sample ID: DUP-1
Matrix: Soil

Collected: 2018/07/27
Shipped:
Received: 2018/07/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5660639	2018/08/02	2018/08/02	Jolly John
Free (WAD) Cyanide	TECH	5661111	2018/08/02	2018/08/03	Louise Harding
Conductivity	AT	5660717	2018/08/02	2018/08/02	Tahir Anwar
Hexavalent Chromium in Soil by IC	IC/SPEC	5657647	2018/07/31	2018/08/03	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5660612	2018/08/02	2018/08/03	Daniel Teclu
Moisture	BAL	5658857	N/A	2018/08/01	Prgya Panchal
pH CaCl2 EXTRACT	AT	5658853	2018/08/01	2018/08/01	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5653480	N/A	2018/08/03	Automated Statchk

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Maxxam Job #: B8J1488
Report Date: 2018/08/07

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

GENERAL COMMENTS

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

Package 1	6.7°C

Results relate only to the items tested.

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Maxxam Job #: B8J1488
Report Date: 2018/08/07

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5657647	Chromium (VI)	2018/08/03	43 (1)	70 - 130	88	80 - 120	<0.2	ug/g	NC	35
5658853	Available (CaCl2) pH	2018/08/01			100	97 - 103			0.39	N/A
5658857	Moisture	2018/08/01							2.8	20
5660612	Acid Extractable Antimony (Sb)	2018/08/03	96	75 - 125	103	80 - 120	<0.20	ug/g	NC	30
5660612	Acid Extractable Arsenic (As)	2018/08/03	102	75 - 125	105	80 - 120	<1.0	ug/g	4.2	30
5660612	Acid Extractable Barium (Ba)	2018/08/03	NC	75 - 125	104	80 - 120	<0.50	ug/g	3.0	30
5660612	Acid Extractable Beryllium (Be)	2018/08/03	98	75 - 125	98	80 - 120	<0.20	ug/g	2.2	30
5660612	Acid Extractable Boron (B)	2018/08/03	95	75 - 125	93	80 - 120	<5.0	ug/g	0.65	30
5660612	Acid Extractable Cadmium (Cd)	2018/08/03	102	75 - 125	100	80 - 120	<0.10	ug/g	NC	30
5660612	Acid Extractable Chromium (Cr)	2018/08/03	101	75 - 125	102	80 - 120	<1.0	ug/g	1.3	30
5660612	Acid Extractable Cobalt (Co)	2018/08/03	98	75 - 125	101	80 - 120	<0.10	ug/g	3.4	30
5660612	Acid Extractable Copper (Cu)	2018/08/03	96	75 - 125	101	80 - 120	<0.50	ug/g	0.73	30
5660612	Acid Extractable Lead (Pb)	2018/08/03	100	75 - 125	101	80 - 120	<1.0	ug/g	0.98	30
5660612	Acid Extractable Mercury (Hg)	2018/08/03	101	75 - 125	99	80 - 120	<0.050	ug/g	NC	30
5660612	Acid Extractable Molybdenum (Mo)	2018/08/03	102	75 - 125	100	80 - 120	<0.50	ug/g	NC	30
5660612	Acid Extractable Nickel (Ni)	2018/08/03	99	75 - 125	99	80 - 120	<0.50	ug/g	4.6	30
5660612	Acid Extractable Selenium (Se)	2018/08/03	100	75 - 125	104	80 - 120	<0.50	ug/g	NC	30
5660612	Acid Extractable Silver (Ag)	2018/08/03	99	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
5660612	Acid Extractable Thallium (Tl)	2018/08/03	96	75 - 125	100	80 - 120	<0.050	ug/g	9.4	30
5660612	Acid Extractable Uranium (U)	2018/08/03	92	75 - 125	93	80 - 120	<0.050	ug/g	3.3	30
5660612	Acid Extractable Vanadium (V)	2018/08/03	NC	75 - 125	102	80 - 120	<5.0	ug/g	0.19	30
5660612	Acid Extractable Zinc (Zn)	2018/08/03	NC	75 - 125	98	80 - 120	<5.0	ug/g	2.5	30
5660639	Hot Water Ext. Boron (B)	2018/08/02	102	75 - 125	105	75 - 125	<0.050	ug/g	0.36	40
5660717	Conductivity	2018/08/02			100	90 - 110	<0.002	mS/cm	0.48	10

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Maxxam Job #: B8J1488
Report Date: 2018/08/07

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5661111	WAD Cyanide (Free)	2018/08/03	103	75 - 125	105	80 - 120	<0.01	ug/g	NC	35

N/A = Not Applicable

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

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

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

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

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

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

(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The matrix spike was reanalyzed to confirm result.

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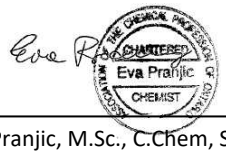
Maxxam Job #: B8J1488
Report Date: 2018/08/07

ARCADIS Canada Inc
Client Project #: 450271-000
Site Location: 1830 TRIM RD
Sampler Initials: SH

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	Same	Quotation #:	B81974	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable Canada	Attention:	Trey + Steve	P.O. #:			675490
Address:	1050 Morrison Drive Unit 201	Address:		Project:	450271-000	COC #:	Project Manager:
	Ottawa ON K2H 8K7			Project Name:	1830 Trim Rd	C#675490-01-01	Jonathan Urben
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Site #:			
Email:	AccountsPayable.Canada@arcadis.com	Email:	trey.austin@arcadis.com + Steven.Hennington@arcadis.com	Sampled By:	S. Hennington		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☒ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☒ For RSC
- ☒ Table 6

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality
- ☐ PWQO
- ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)?

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	# of Bottles	Comments
1		BH18-8-1	18/7/27	8:30	Soil	N	X	1	
2		BH18-8-2	"	8:30	"	"	X	1	Hold Sample
3		BH18-9-1	"	14:30	"	"	X	1	
4		BH18-9-2	"	14:30	"	"	X	1	Hold Sample
5		BH18-10-1	"	15:30	"	"	X	1	
6		DUP-1	"	15:30	"	"	X	1	
7		BH18-10-2	"	15:30	"	"	X	1	Hold Sample
8									
9									on ice
10									

27-Jul-18 17:43
Jonathan Urben
B8J1488
TLI ENV-803

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
S. Hennington	18/7/27	17:42	Ian Campbell	2018/07/27	17:43	
			Gwendolyn Gruendler	2018/07/28	08:47	

Laboratory Use Only — RECEIVED IN OTTAWA

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	1, 3, 6	Present	☒	
		Intact	☒	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Reject ACTR.

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: 450271
Site Location: TRIM ROAD
Your C.O.C. #: 652288-01-01, 652288-02-01

Attention: Lennart de Groot

ARCADIS Canada Inc
1050 Morrison Drive
Unit 201
Ottawa, ON
K2H 8K7

Report Date: 2018/03/21
Report #: R5049365
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B856137
Received: 2018/03/13, 14:30

Sample Matrix: Soil
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	4	2018/03/16	2018/03/19	CAM SOP-00457	OMOE E3015 m
Conductivity (1)	5	2018/03/19	2018/03/19	CAM SOP-00414	OMOE E3530 v1 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	4	N/A	2018/03/16	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	4	2018/03/15	2018/03/16	CAM SOP-00316	CCME CWS m
Moisture (1)	4	N/A	2018/03/15	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture (1)	4	N/A	2018/03/20	CAM SOP-00445	Carter 2nd ed 51.2 m
Polychlorinated Biphenyl in Soil (1)	4	2018/03/15	2018/03/15	CAM SOP-00309	EPA 8082A m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 450271
Site Location: TRIM ROAD
Your C.O.C. #: 652288-01-01, 652288-02-01

Attention: Lennart de Groot

ARCADIS Canada Inc
1050 Morrison Drive
Unit 201
Ottawa, ON
K2H 8K7

Report Date: 2018/03/21
Report #: R5049365
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B856137
Received: 2018/03/13, 14:30

(1) This test was performed by Maxxam Analytics Mississauga
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Jonathan Urben, Senior Project Manager
Email: jurben@maxxam.ca
Phone# (613) 274-0573

==========

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Maxxam Job #: B856137
Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		GGD036	GGD037	GGD038	GGD066		
Sampling Date		2018/03/13 10:30	2018/03/13 10:45	2018/03/13 11:00	2018/03/13 10:45		
COC Number		652288-01-01	652288-01-01	652288-01-01	652288-02-01		
	UNITS	**BH-18-5**	**BH-18-6**	**BH-18-7**	**DUP-3**	**RDL**	**QC Batch**
Inorganics							
Moisture	%	29	28	34	29	1.0	5443230
BTEX & F1 Hydrocarbons							
Benzene	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	5444588
Toluene	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	5444588
Ethylbenzene	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	5444588
o-Xylene	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	5444588
p+m-Xylene	ug/g	<0.080	<0.080	<0.080	<0.080	0.080	5444588
Total Xylenes	ug/g	<0.080	<0.080	<0.080	<0.080	0.080	5444588
F1 (C6-C10)	ug/g	<20	<20	<20	<20	20	5444588
F1 (C6-C10) - BTEX	ug/g	<20	<20	<20	<20	20	5444588
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	10	5442020
F3 (C16-C34 Hydrocarbons)	ug/g	69	<50	64	60	50	5442020
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	50	5442020
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		5442020
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	98	98	96	97		5444588
4-Bromofluorobenzene	%	105	105	105	103		5444588
D10-Ethylbenzene	%	99	102	104	95		5444588
D4-1,2-Dichloroethane	%	92	93	92	92		5444588
o-Terphenyl	%	103	101	104	103		5442020

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B856137
Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

RESULTS OF ANALYSES OF SOIL

Maxxam ID		GGD032	GGD033	GGD034	GGD035			GGD039		
Sampling Date		2018/03/13 08:30	2018/03/13 09:00	2018/03/13 09:30	2018/03/13 10:30			2018/03/13 11:00		
COC Number		652288-01-01	652288-01-01	652288-01-01	652288-01-01			652288-01-01		
	UNITS	**BH 18-1**	**BH 18-2**	**BH 18-3**	**BH 18-4**	**RDL**	**QC Batch**	**SP 301**	**RDL**	**QC Batch**
Inorganics										
Conductivity	mS/cm	0.25	0.33	0.63	0.51	0.002	5445859			
Moisture	%							27	1.0	5449048
WAD Cyanide (Free)	ug/g							<0.01	0.01	5444101

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		GGD040	GGD041			GGD064			GGD065		
Sampling Date		2018/03/13 11:30	2018/03/13 12:00			2018/03/13			2018/03/13		
COC Number		652288-01-01	652288-01-01			652288-02-01			652288-02-01		
	UNITS	**SP 302**	**SP 303**	**RDL**	**QC Batch**	**DUP-1**	**RDL**	**QC Batch**	**DUP-2**	**RDL**	**QC Batch**
Inorganics											
Conductivity	mS/cm					0.29	0.002	5445859			
Moisture	%	30	30	1.0	5449048				27	1.0	5449048
WAD Cyanide (Free)	ug/g	<0.01	<0.01	0.01	5444101				<0.01	0.01	5444101

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		GGD036	GGD037		GGD038		GGD066		
Sampling Date		2018/03/13 10:30	2018/03/13 10:45		2018/03/13 11:00		2018/03/13 10:45		
COC Number		652288-01-01	652288-01-01		652288-01-01		652288-02-01		
	UNITS	**BH-18-5**	**BH-18-6**	**RDL**	**BH-18-7**	**RDL**	**DUP-3**	**RDL**	**QC Batch**
PCBs									
Aroclor 1016	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1221	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1232	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1242	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1248	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1254	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1260	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1262	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Aroclor 1268	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Total PCB	ug/g	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	5442579
Surrogate Recovery (%)									
Decachlorobiphenyl	%	91	91		85		85		5442579

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B856137
Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

TEST SUMMARY

Maxxam ID: GGD032
Sample ID: BH 18-1
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5445859	2018/03/19	2018/03/19	Tahir Anwar

Maxxam ID: GGD033
Sample ID: BH 18-2
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5445859	2018/03/19	2018/03/19	Tahir Anwar

Maxxam ID: GGD034
Sample ID: BH 18-3
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5445859	2018/03/19	2018/03/19	Tahir Anwar

Maxxam ID: GGD035
Sample ID: BH 18-4
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5445859	2018/03/19	2018/03/19	Tahir Anwar

Maxxam ID: GGD036
Sample ID: BH-18-5
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5444588	N/A	2018/03/16	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5442020	2018/03/15	2018/03/16	(Kent) Maolin Li
Moisture	BAL	5443230	N/A	2018/03/15	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	5442579	2018/03/15	2018/03/15	Sarah Huang

Maxxam ID: GGD037
Sample ID: BH-18-6
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5444588	N/A	2018/03/16	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5442020	2018/03/15	2018/03/16	(Kent) Maolin Li
Moisture	BAL	5443230	N/A	2018/03/15	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	5442579	2018/03/15	2018/03/15	Sarah Huang

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Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

TEST SUMMARY

Maxxam ID: GGD038
Sample ID: BH-18-7
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5444588	N/A	2018/03/16	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5442020	2018/03/15	2018/03/16	(Kent) Maolin Li
Moisture	BAL	5443230	N/A	2018/03/15	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	5442579	2018/03/15	2018/03/15	Sarah Huang

Maxxam ID: GGD039
Sample ID: SP 301
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	5444101	2018/03/16	2018/03/19	Louise Harding
Moisture	BAL	5449048	N/A	2018/03/20	Chun Yan

Maxxam ID: GGD040
Sample ID: SP 302
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	5444101	2018/03/16	2018/03/19	Louise Harding
Moisture	BAL	5449048	N/A	2018/03/20	Chun Yan

Maxxam ID: GGD041
Sample ID: SP 303
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	5444101	2018/03/16	2018/03/19	Louise Harding
Moisture	BAL	5449048	N/A	2018/03/20	Chun Yan

Maxxam ID: GGD064
Sample ID: DUP-1
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5445859	2018/03/19	2018/03/19	Tahir Anwar

Maxxam ID: GGD065
Sample ID: DUP-2
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	5444101	2018/03/16	2018/03/19	Louise Harding
Moisture	BAL	5449048	N/A	2018/03/20	Chun Yan

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Maxxam Job #: B856137
Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

TEST SUMMARY

Maxxam ID: GGD066
Sample ID: DUP-3
Matrix: Soil

Collected: 2018/03/13
Shipped:
Received: 2018/03/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5444588	N/A	2018/03/16	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5442020	2018/03/15	2018/03/16	(Kent) Maolin Li
Moisture	BAL	5443230	N/A	2018/03/15	Prgya Panchal
Polychlorinated Biphenyl in Soil	GC/ECD	5442579	2018/03/15	2018/03/15	Sarah Huang

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Maxxam Job #: B856137
Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

GENERAL COMMENTS

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

Package 1	0.0°C

Cooler custody seal was present and intact.

Sample GGD036 [BH-18-5] : F1/BTEX Analysis:
Detection limits were adjusted for high moisture content and sample weight.

Sample GGD037 [BH-18-6] : F1/BTEX Analysis:
Detection limits were adjusted for high moisture content and sample weight.

Sample GGD038 [BH-18-7] : PCB Analysis: Detection limits were adjusted for high moisture content.

F1/BTEX Analysis:
Detection limits were adjusted for high moisture content and sample weight.

Sample GGD066 [DUP-3] : F1/BTEX Analysis:
Detection limits were adjusted for high moisture content and sample weight.

Results relate only to the items tested.

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Maxxam Job #: B856137
Report Date: 2018/03/21

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5442020	o-Terphenyl	2018/03/16	96	60 - 130	98	60 - 130	101	%		
5442579	Decachlorobiphenyl	2018/03/15	76	60 - 130	85	60 - 130	77	%		
5444588	1,4-Difluorobenzene	2018/03/16	99	60 - 140	97	60 - 140	98	%		
5444588	4-Bromofluorobenzene	2018/03/16	107	60 - 140	108	60 - 140	105	%		
5444588	D10-Ethylbenzene	2018/03/16	98	60 - 140	88	60 - 140	97	%		
5444588	D4-1,2-Dichloroethane	2018/03/16	94	60 - 140	90	60 - 140	91	%		
5442020	F2 (C10-C16 Hydrocarbons)	2018/03/16	92	50 - 130	92	80 - 120	<10	ug/g	NC	30
5442020	F3 (C16-C34 Hydrocarbons)	2018/03/16	93	50 - 130	94	80 - 120	<50	ug/g	NC	30
5442020	F4 (C34-C50 Hydrocarbons)	2018/03/16	91	50 - 130	91	80 - 120	<50	ug/g	NC	30
5442579	Aroclor 1016	2018/03/15					<0.010	ug/g		
5442579	Aroclor 1221	2018/03/15					<0.010	ug/g		
5442579	Aroclor 1232	2018/03/15					<0.010	ug/g		
5442579	Aroclor 1242	2018/03/15					<0.010	ug/g	NC	50
5442579	Aroclor 1248	2018/03/15					<0.010	ug/g	NC	50
5442579	Aroclor 1254	2018/03/15					<0.010	ug/g	NC	50
5442579	Aroclor 1260	2018/03/15	85	60 - 130	92	60 - 130	<0.010	ug/g	NC	50
5442579	Aroclor 1262	2018/03/15					<0.010	ug/g		
5442579	Aroclor 1268	2018/03/15					<0.010	ug/g		
5442579	Total PCB	2018/03/15	85	60 - 130	92	60 - 130	<0.010	ug/g	NC	50
5443230	Moisture	2018/03/15							0.50	20
5444101	WAD Cyanide (Free)	2018/03/19	103	75 - 125	95	80 - 120	<0.01	ug/g	NC	35
5444588	Benzene	2018/03/16	90	60 - 140	95	60 - 140	<0.020	ug/g	NC	50
5444588	Ethylbenzene	2018/03/16	87	60 - 140	91	60 - 140	<0.020	ug/g	NC	50
5444588	F1 (C6-C10) - BTEX	2018/03/16					<10	ug/g	NC	30
5444588	F1 (C6-C10)	2018/03/16	90	60 - 140	103	80 - 120	<10	ug/g	NC	30
5444588	o-Xylene	2018/03/16	93	60 - 140	94	60 - 140	<0.020	ug/g	NC	50
5444588	p+m-Xylene	2018/03/16	85	60 - 140	88	60 - 140	<0.040	ug/g	NC	50
5444588	Toluene	2018/03/16	87	60 - 140	91	60 - 140	<0.020	ug/g	NC	50
5444588	Total Xylenes	2018/03/16					<0.040	ug/g	NC	50
5445859	Conductivity	2018/03/19			99	90 - 110	<0.002	mS/cm	1.4	10

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Maxxam Job #: B856137
Report Date: 2018/03/21

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5449048	Moisture	2018/03/20							4.7	20

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

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

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

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

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

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

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Maxxam Job #: B856137
Report Date: 2018/03/21

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LG

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B54416	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable Canada	Attention:	Lennart de Groot	P.O. #:			652288
Address:	1050 Morrison Drive Unit 201	Address:		Project:	450271	COC #:	Project Manager:
	Ottawa ON K2H 8K7			Project Name:	Trim Road	C#652288-01-01	Jonathan Urben
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Site #:			
Email:	AccoutsPayable.Canada@arcadis.com	Email:	lennart.degroot@arcadis.com	Sampled By:	Lennart		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☑ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☑ For RSC; ☑ Table 6

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558 ☐ Storm Sewer Bylaw; ☐ MISA Municipality ____; ☐ PWQO; ☐ Other ____

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ____

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Polychlorinated Biphenyl in Soil	Petroleum Hydro. CCME F1 & BTEX in Soil	Petroleum Hydrocarbons F2-F4 in Soil	Conductivity EC	Free (WAD) Cyanide	Particle Size Distribution with Graph	# of Bottles	Comments
1		BH18-1	March 13 2018	8:30	Soil				X			1	
2		BH18-2	March 13 2018	9:00	Soil				X			1	
3		BH18-3	March 13 2018	9:30	Soil				X			1	
4		BH18-4	March 13 2018	10:30	Soil				X			1	
5		BH18-5	March 13 2018	10:30	Soil	✓	✓	✓				4	RECEIVED IN OTTAWA
6		BH18-6	March 13 2018	10:45	Soil	✓	✓	✓				4	
7		BH18-7	March 13 2018	11:00	Soil	✓	✓	✓				4	
8		SP301	March 13 2018	11:00	Soil					X		1	
9		SP302	March 13 2018	11:30	Soil					X		1	On ice
10		SP303	March 13 2018	12:00	Soil					X		1	

13-Mar-18 14:30
Jonathan Urben
B856137
KIV OTT 001

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Lennart de Groot	18-03-13 14:30		Mariana Vascon/Vascon	2018/03/13	14:30	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	0, 0, 0	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam
A Bureau Veritas Group Company

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

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B54416	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable Canada	Attention:	Lennart de Groot	P.O. #:			652288
Address:	1050 Morrison Drive Unit 201	Address:		Project:	450271	COC #:	Project Manager:
	Ottawa ON K2H 8K7			Project Name:		C#652288-02-01	Jonathan Urben
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Site #:			
Email:	AccoutsPayable.Canada@arcadis.com	Email:	lennart.degroot@arcadis.com	Sampled By:	Lennart		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☑ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☑ Table 6

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality
- ☐ PWQO
- ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)?

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Polychlorinated Biphenyl in Soil	Petroleum Hydro. CCME F1 & BTEX in Soil	Petroleum Hydrocarbons F2-F4 in Soil	Conductivity (EC)	Free (WAD) Cyanide	Particle Size Distribution with Graph	# of Bottles	Comments
1		DUP-1	March 13 2018		Soil					X			1	
2		DUP-2	March 13 2018		Soil						X		1	
3		DUP-3	March 13 2018	10:45	Soil		✓	✓	✓				4	
4		Grain 1	March 13 2018	8:30	soil							X	1	
5		Grain 2	"	9:00	soil							X	1	
6		Grain 3	"	9:30	soil							X	1	
7														
8														See page 1
9														
10														

13-Mar-18 14:30
Jonathan Urben
B856137
KIV OTT 001

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Lennart de Groot	18:03 13 14:30						Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
									Present		
									Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

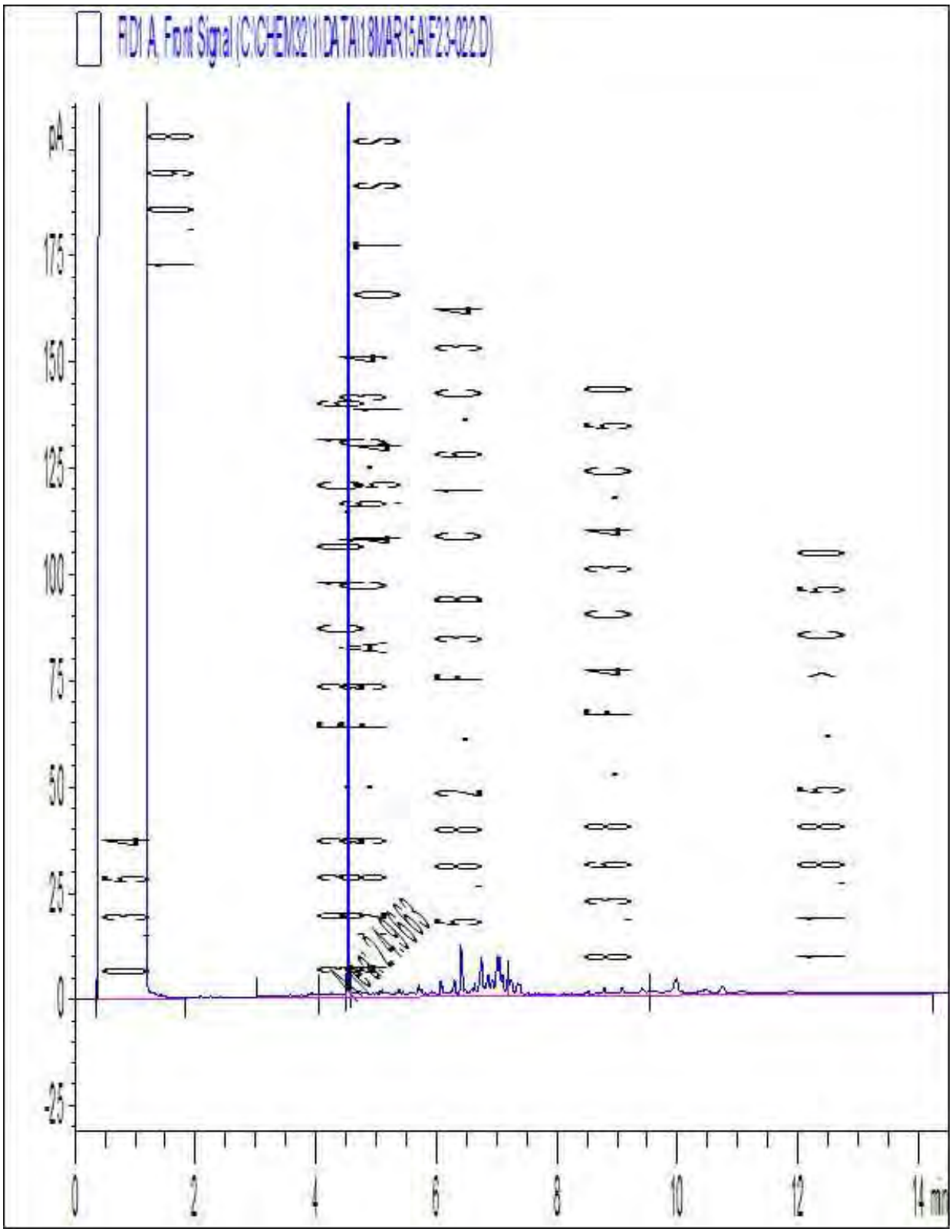
White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B856137
Report Date: 2018/03/21
Maxxam Sample: GGD036

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: BH-18-5

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

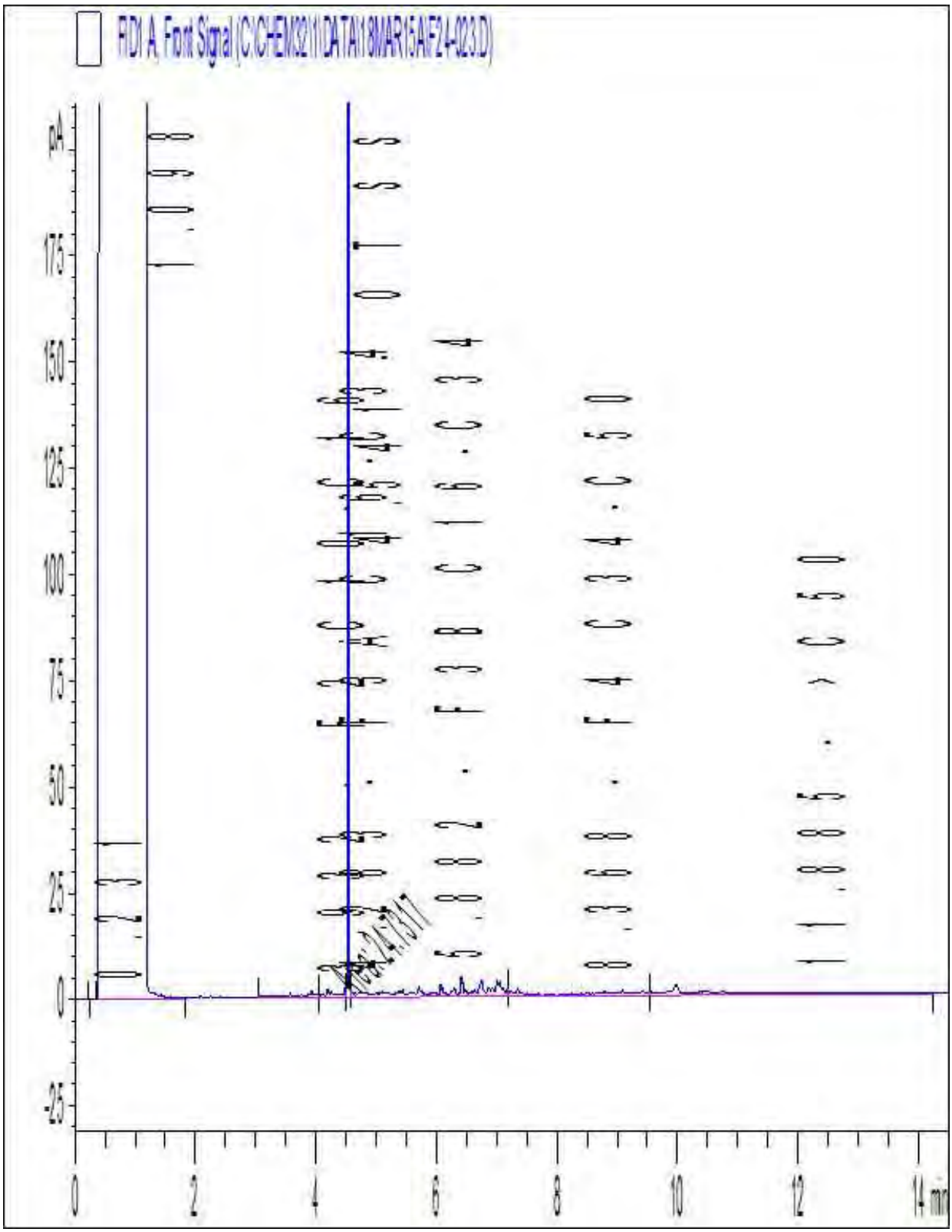


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B856137
Report Date: 2018/03/21
Maxxam Sample: GGD037

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: BH-18-6

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

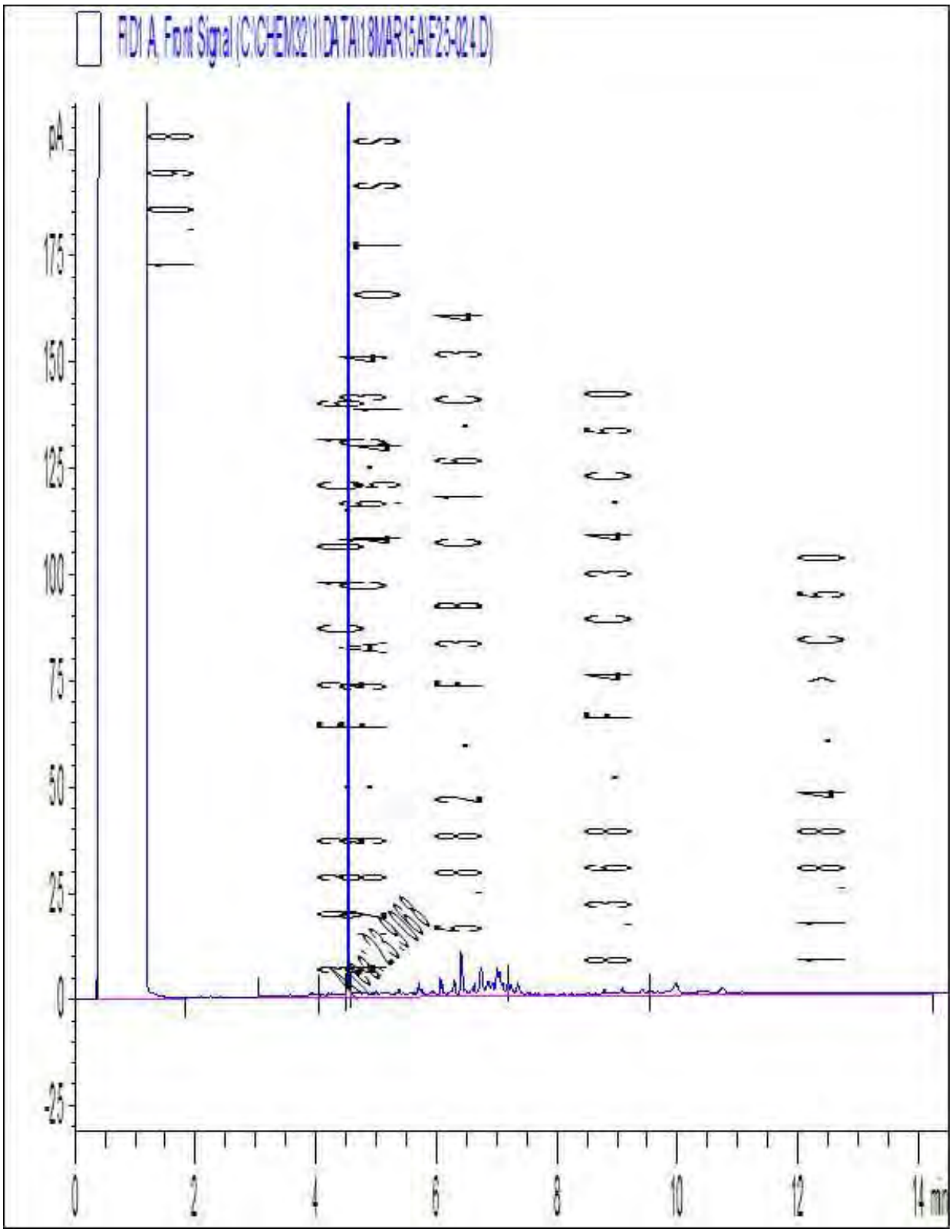


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B856137
Report Date: 2018/03/21
Maxxam Sample: GGD038

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: BH-18-7

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

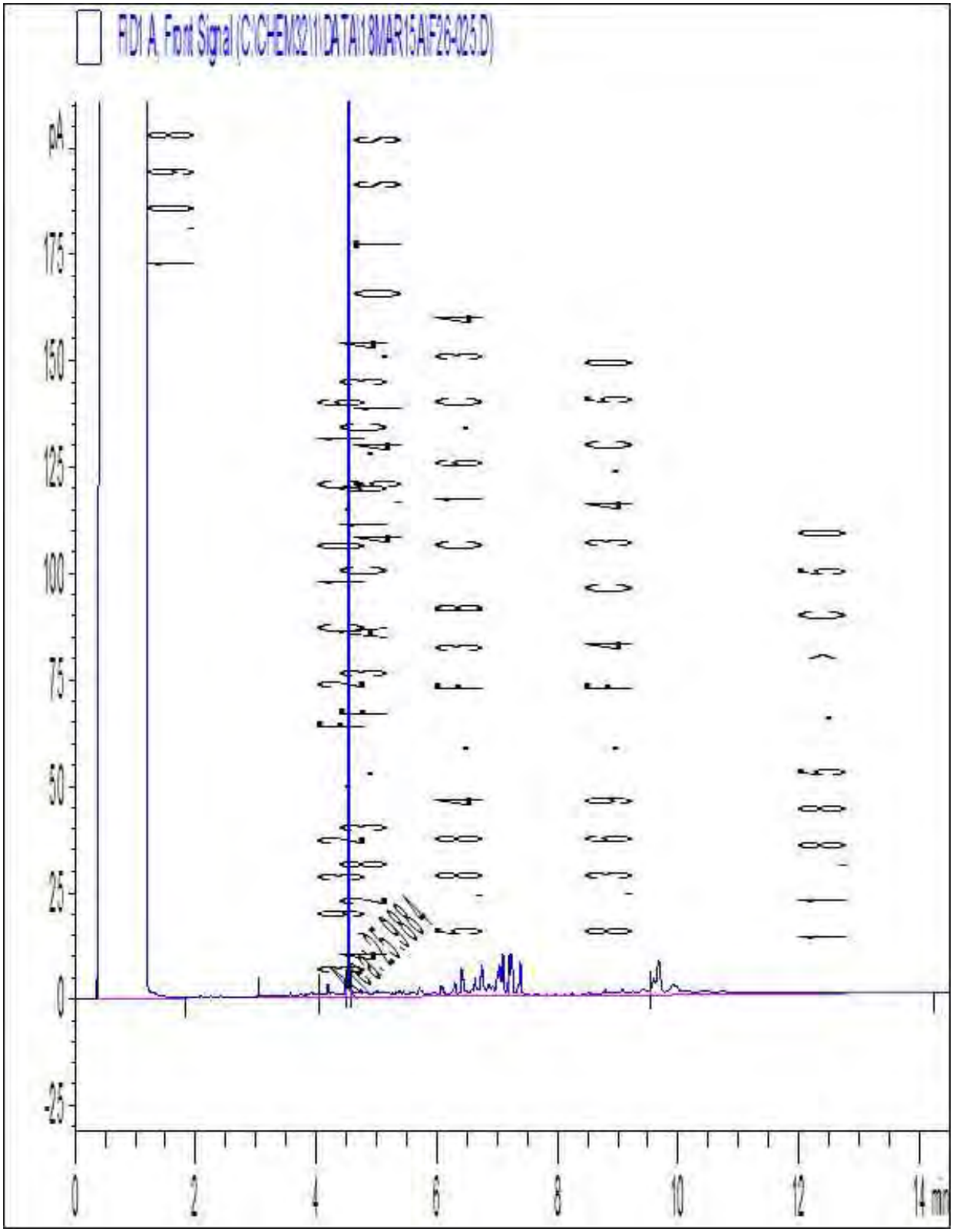


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B856137
Report Date: 2018/03/21
Maxxam Sample: GGD066

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: DUP-3

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Grain Size Analysis Report

Client Sample ID: GRAIN 1 (GGD067)
Maxxam Sample ID: TC2480
Maxxam Job #: B818821

Tot. Sample Wt (g)*: 7.95
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8934791
Batch # (Hydro): 8937733

Analysis Date (Sieve): 2018/03/15
Analysis Date (Hydro): 2018/03/18

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	99.9
	Sieve 100	0.150	99.9
	Sieve 200	0.075	99.9
Hydrometer	R1min	0.0421	90.6
	R3min	0.0243	86.9
	R10min	0.0133	85.7
	R30min	0.0081	64.9
	R90min	0.0048	56.3
	R270min	0.0029	49.0
	R1080min	0.0015	22.0

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	7.2
Silt	0.002	0.050	61.1
Clay	-	0.002	31.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

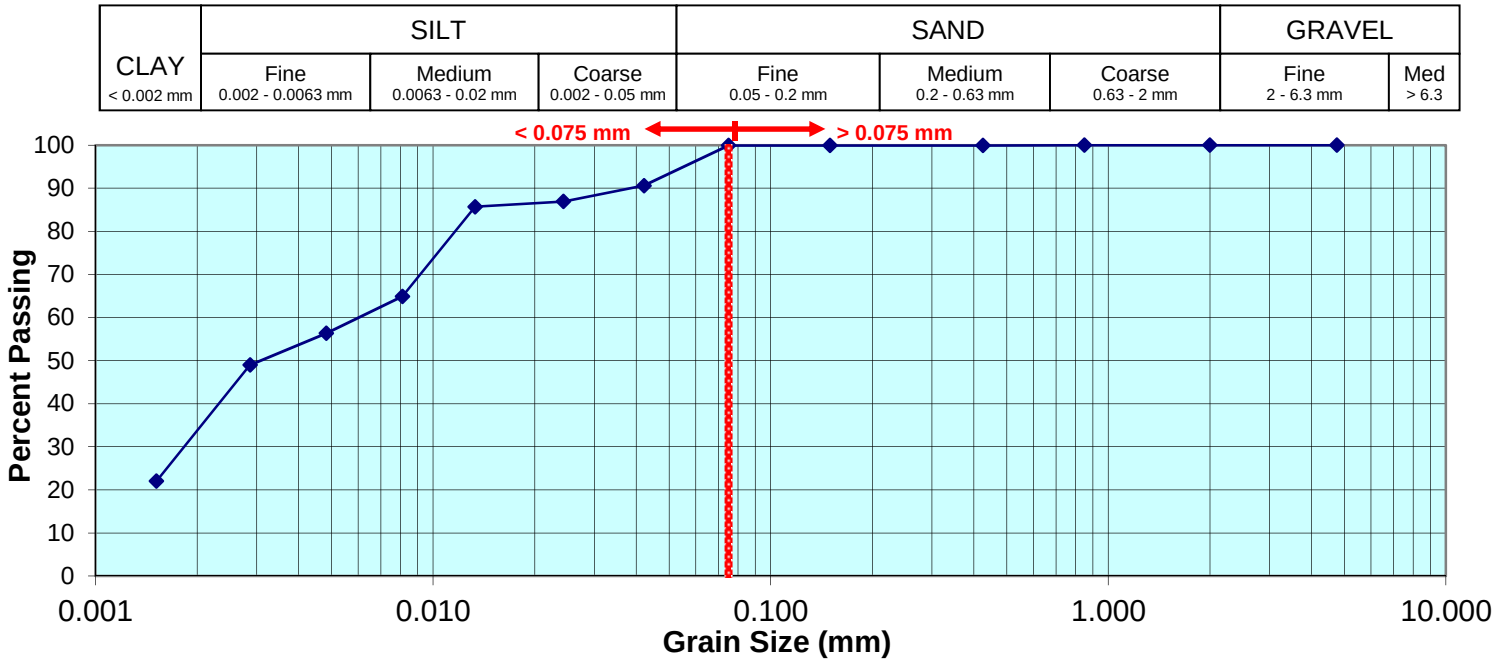
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.9
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.9
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: GRAIN 2 (GGD068)
Maxxam Sample ID: TC2481
Maxxam Job #: B818821

Tot. Sample Wt (g)*: 7.08
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8934791
Batch # (Hydro): 8937733

Analysis Date (Sieve): 2018/03/15
Analysis Date (Hydro): 2018/03/18

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	99.9
	Sieve 200	0.075	99.8
Hydrometer	R1min	0.0421	95.0
	R3min	0.0243	92.6
	R10min	0.0133	90.3
	R30min	0.0078	73.6
	R90min	0.0047	64.1
	R270min	0.0028	54.6
	R1080min	0.0015	26.1

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	3.8
Silt	0.002	0.050	59.1
Clay	-	0.002	37.1

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

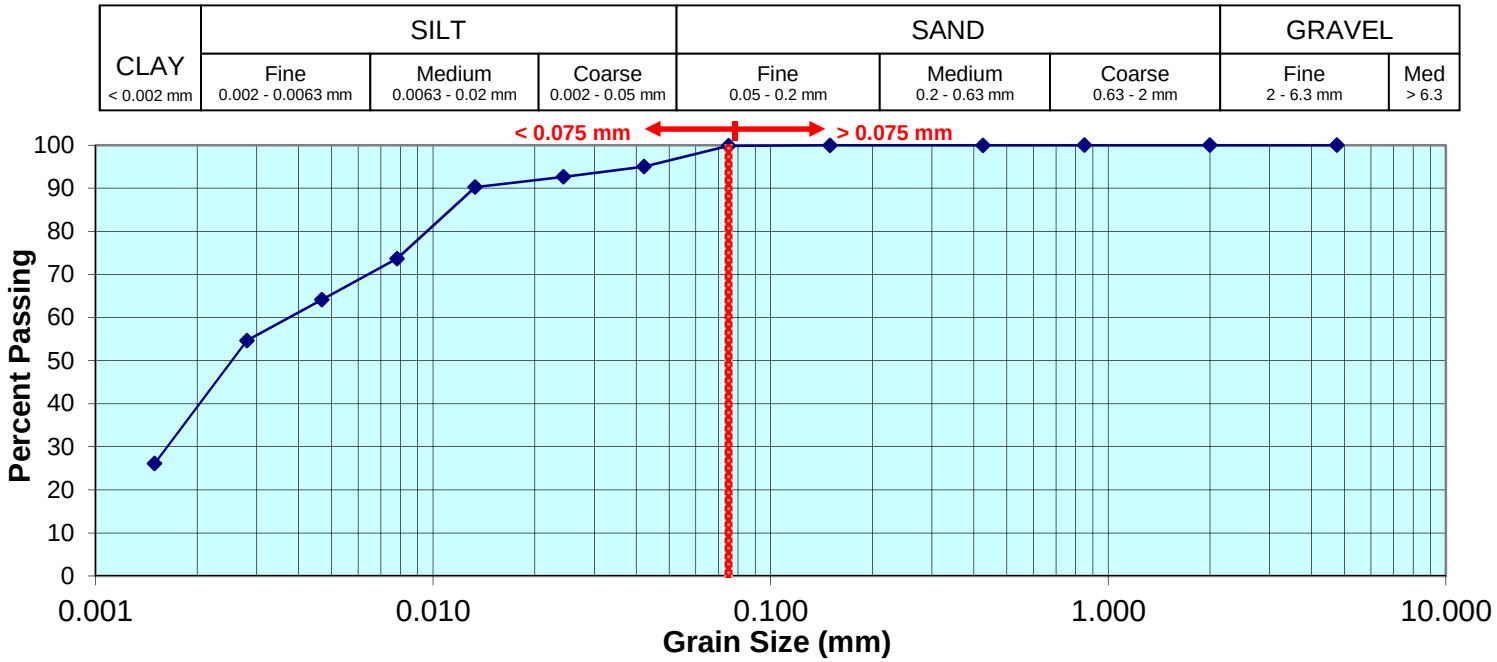
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: GRAIN 3 (GGD069)
Maxxam Sample ID: TC2482
Maxxam Job #: B818821

Tot. Sample Wt (g)*: 7.68
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8934791
Batch # (Hydro): 8937733

Analysis Date (Sieve): 2018/03/15
Analysis Date (Hydro): 2018/03/18

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	99.9
	Sieve 200	0.075	99.8
Hydrometer	R1min	0.0421	91.9
	R3min	0.0243	87.1
	R10min	0.0133	87.1
	R30min	0.0081	65.3
	R90min	0.0048	58.1
	R270min	0.0029	48.4
	R1080min	0.0015	24.2

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	6.2
Silt	0.002	0.050	60.8
Clay	-	0.002	33.0

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

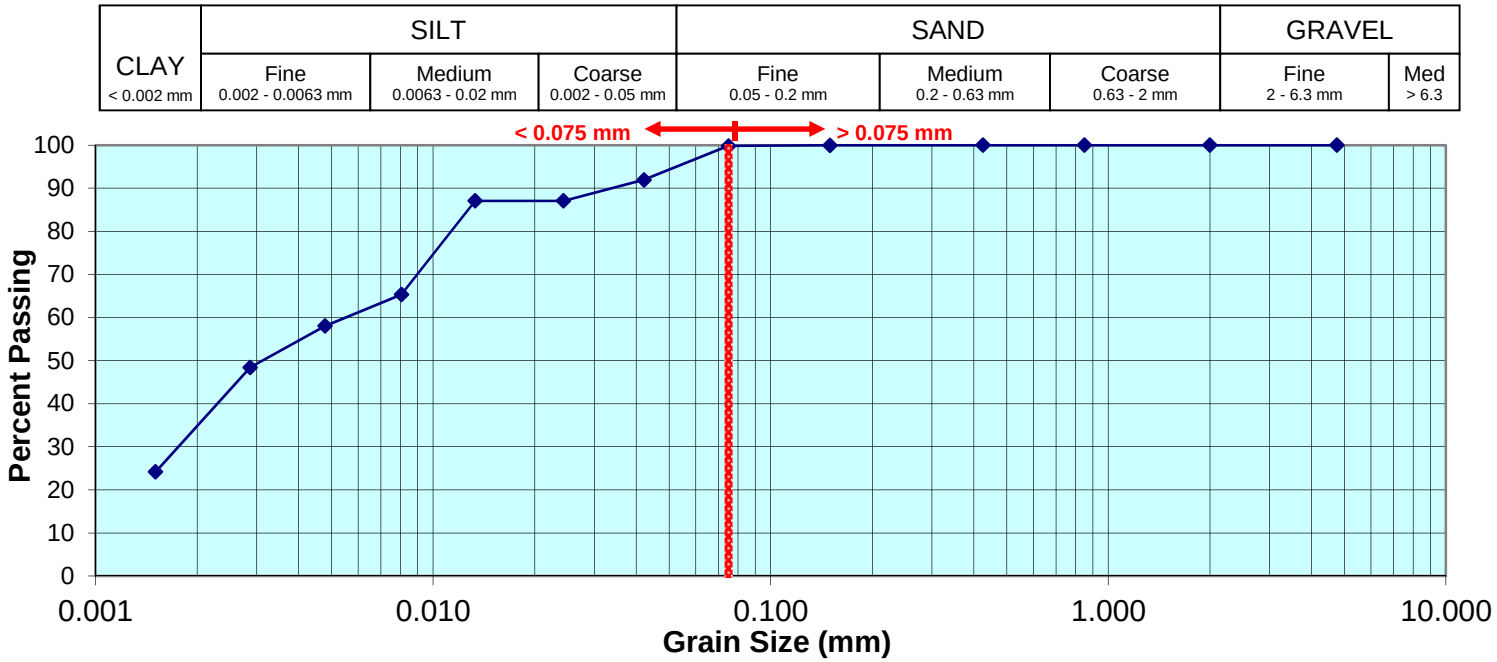
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report (QA-SRM)

Sieve Batch #: 8934791
Hydrometer Batch #: 8937733

Standard Reference Material

			Acceptance Limits	
	Fraction	% Recovery	Minimum	Maximum
Sieve	> 0.075 mm	97	75	125
	< 0.075 mm	102	75	125
Hydrometer	Sand	105	81	119
	Silt	-	0	0
	Clay	-	0	0

APPENDIX E

Laboratory Certificates of Analysis- Ground Water

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 548176-07-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/25
Report #: R3909101
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B634115
Received: 2016/02/19, 09:30

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	5	N/A	2016/02/24	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	5	N/A	2016/02/25		EPA 8260C m
Chloride by Automated Colourimetry (1)	5	N/A	2016/02/22	CAM SOP-00463	EPA 325.2 m
Chromium (VI) in Water (1)	5	N/A	2016/02/22	CAM SOP-00436	EPA 7199 m
Free (WAD) Cyanide (1)	4	N/A	2016/02/22	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide (1)	1	N/A	2016/02/23	CAM SOP-00457	OMOE E3015 m
Petroleum Hydro. CCME F1 & BTEX in Water (1)	5	N/A	2016/02/24	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	5	2016/02/24	2016/02/25	CAM SOP-00316	CCME PHC-CWS m
Mercury (1)	5	2016/02/24	2016/02/25	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS (1)	5	N/A	2016/02/23	CAM SOP-00447	EPA 6020A m
OC Pesticides (Selected) & PCB (1, 3)	2	2016/02/22	2016/02/23	CAM SOP-00307	EPA 8081/8082 m
OC Pesticides Summed Parameters (1)	2	N/A	2016/02/23	CAM SOP-00307	EPA 8081/8082 m
PAH Compounds in Water by GC/MS (SIM)	5	2016/02/22	2016/02/22	OTT SOP-00011	EPA 8270D m
Volatile Organic Compounds in Water (1)	5	N/A	2016/02/24	CAM SOP000228	EPA 8260C m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

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

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

Your Project #: 450271-000
Your C.O.C. #: 548176-07-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2016/02/25
Report #: R3909101
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B634115
Received: 2016/02/19, 09:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID		BWP031		BWP032			BWP033		
Sampling Date		2016/02/18 13:00		2016/02/18 14:00			2016/02/18 14:30		
COC Number		548176-07-01		548176-07-01			548176-07-01		
	UNITS	**MW16-1**	**RDL**	**MW16-2**	**RDL**	**QC Batch**	**MW16-3**	**RDL**	**QC Batch**
Inorganics									
Free Cyanide	ug/L	<2	2	<2	2	4388981	<2	2	4388981
Dissolved Chloride (Cl)	mg/L	34	1.0	570	5.0	4389134	320	4.0	4389134
Metals									
Chromium (VI)	ug/L	<0.50	0.50	<0.50	0.50	4389245	<0.50	0.50	4389245
Mercury (Hg)	ug/L	<0.1	0.1	<0.1	0.1	4392978	<0.1	0.1	4392978
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	4389274	<0.50	0.50	4389277
Dissolved Arsenic (As)	ug/L	<1.0	1.0	<1.0	1.0	4389274	<1.0	1.0	4389277
Dissolved Barium (Ba)	ug/L	74	2.0	110	2.0	4389274	38	2.0	4389277
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	0.50	4389274	<0.50	0.50	4389277
Dissolved Boron (B)	ug/L	52	10	54	10	4389274	66	10	4389277
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	<0.10	0.10	4389274	<0.10	0.10	4389277
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	4389274	<5.0	5.0	4389277
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	1.8	0.50	4389274	1.5	0.50	4389277
Dissolved Copper (Cu)	ug/L	<1.0	1.0	<1.0	1.0	4389274	1.3	1.0	4389277
Dissolved Lead (Pb)	ug/L	<0.50	0.50	0.77	0.50	4389274	<0.50	0.50	4389277
Dissolved Molybdenum (Mo)	ug/L	3.9	0.50	2.3	0.50	4389274	0.94	0.50	4389277
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	1.4	1.0	4389274	5.4	1.0	4389277
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	4389274	<2.0	2.0	4389277
Dissolved Silver (Ag)	ug/L	<0.10	0.10	<0.10	0.10	4389274	<0.10	0.10	4389277
Dissolved Sodium (Na)	ug/L	58000	100	95000	100	4389274	290000	100	4389277
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	4389274	0.058	0.050	4389277
Dissolved Uranium (U)	ug/L	13	0.10	19	0.10	4389274	4.4	0.10	4389277
Dissolved Vanadium (V)	ug/L	1.1	0.50	3.2	0.50	4389274	<0.50	0.50	4389277
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	4389274	<10 (1)	10	4389277

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Metal Analysis:Detection Limit was raised due to matrix interferences.

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Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID		BWP034			BWP035	BWP035		
Sampling Date		2016/02/18 15:00			2016/02/18 13:00	2016/02/18 13:00		
COC Number		548176-07-01			548176-07-01	548176-07-01		
	UNITS	**MW16-4**	**RDL**	**QC Batch**	**DUP-1**	**DUP-1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Free Cyanide	ug/L	<2	2	4388981	<2		2	4391666
Dissolved Chloride (Cl)	mg/L	1100	10	4389134	34	34	1.0	4389134
Metals								
Chromium (VI)	ug/L	<0.50	0.50	4389245	<0.50		0.50	4389239
Mercury (Hg)	ug/L	<0.1	0.1	4392978	<0.1		0.1	4392978
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	4389274	<0.50		0.50	4389274
Dissolved Arsenic (As)	ug/L	<2.0	2.0	4389274	<1.0		1.0	4389274
Dissolved Barium (Ba)	ug/L	140	2.0	4389274	74		2.0	4389274
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	4389274	<0.50		0.50	4389274
Dissolved Boron (B)	ug/L	64	10	4389274	50		10	4389274
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	4389274	<0.10		0.10	4389274
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	4389274	<5.0		5.0	4389274
Dissolved Cobalt (Co)	ug/L	1.1	1.0	4389274	<0.50		0.50	4389274
Dissolved Copper (Cu)	ug/L	<1.0	1.0	4389274	<1.0		1.0	4389274
Dissolved Lead (Pb)	ug/L	<0.50	0.50	4389274	<0.50		0.50	4389274
Dissolved Molybdenum (Mo)	ug/L	3.5	0.50	4389274	4.2		0.50	4389274
Dissolved Nickel (Ni)	ug/L	2.1	2.0	4389274	<1.0		1.0	4389274
Dissolved Selenium (Se)	ug/L	<2.0	2.0	4389274	<2.0		2.0	4389274
Dissolved Silver (Ag)	ug/L	<0.10	0.10	4389274	<0.10		0.10	4389274
Dissolved Sodium (Na)	ug/L	410000	100	4389274	57000		100	4389274
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	4389274	<0.050		0.050	4389274
Dissolved Uranium (U)	ug/L	22	0.10	4389274	13		0.10	4389274
Dissolved Vanadium (V)	ug/L	2.8	1.0	4389274	1.2		0.50	4389274
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	4389274	<5.0		5.0	4389274

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 OC PESTICIDES (WATER)

Maxxam ID		BWP031	BWP035		
Sampling Date		2016/02/18 13:00	2016/02/18 13:00		
COC Number		548176-07-01	548176-07-01		
	UNITS	**MW16-1**	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters					
Chlordane (Total)	ug/L	<0.005	<0.005	0.005	4387536
o,p-DDD + p,p-DDD	ug/L	<0.005	<0.005	0.005	4387536
o,p-DDE + p,p-DDE	ug/L	<0.005	<0.005	0.005	4387536
o,p-DDT + p,p-DDT	ug/L	<0.005	<0.005	0.005	4387536
Total Endosulfan	ug/L	<0.005	<0.005	0.005	4387536
Total PCB	ug/L	<0.05	<0.05	0.05	4387536
Pesticides & Herbicides					
Aldrin	ug/L	<0.005	<0.005	0.005	4389579
Dieldrin	ug/L	<0.005	<0.005	0.005	4389579
a-Chlordane	ug/L	<0.005	<0.005	0.005	4389579
g-Chlordane	ug/L	<0.005	<0.005	0.005	4389579
o,p-DDD	ug/L	<0.005	<0.005	0.005	4389579
p,p-DDD	ug/L	<0.005	<0.005	0.005	4389579
o,p-DDE	ug/L	<0.005	<0.005	0.005	4389579
p,p-DDE	ug/L	<0.005	<0.005	0.005	4389579
o,p-DDT	ug/L	<0.005	<0.005	0.005	4389579
p,p-DDT	ug/L	<0.005	<0.005	0.005	4389579
Lindane	ug/L	<0.003	<0.003	0.003	4389579
Endosulfan I (alpha)	ug/L	<0.005	<0.005	0.005	4389579
Endosulfan II (beta)	ug/L	<0.005	<0.005	0.005	4389579
Endrin	ug/L	<0.005	<0.005	0.005	4389579
Heptachlor	ug/L	<0.005	<0.005	0.005	4389579
Heptachlor epoxide	ug/L	<0.005	<0.005	0.005	4389579
Hexachlorobenzene	ug/L	<0.005	<0.005	0.005	4389579
Hexachlorobutadiene	ug/L	<0.009	<0.009	0.009	4389579
Hexachloroethane	ug/L	<0.01	<0.01	0.01	4389579
Methoxychlor	ug/L	<0.01	<0.01	0.01	4389579
Aroclor 1242	ug/L	<0.05	<0.05	0.05	4389579
Aroclor 1248	ug/L	<0.05	<0.05	0.05	4389579
Aroclor 1254	ug/L	<0.05	<0.05	0.05	4389579
Aroclor 1260	ug/L	<0.05	<0.05	0.05	4389579
Surrogate Recovery (%)					
2,4,5,6-Tetrachloro-m-xylene	%	67	70		4389579
Decachlorobiphenyl	%	102	111		4389579

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 PAHS (WATER)

Maxxam ID		BWP031	BWP031	BWP032	BWP033	BWP034	BWP035		
Sampling Date		2016/02/18 13:00	2016/02/18 13:00	2016/02/18 14:00	2016/02/18 14:30	2016/02/18 15:00	2016/02/18 13:00		
COC Number		548176-07-01	548176-07-01	548176-07-01	548176-07-01	548176-07-01	548176-07-01		
	UNITS	**MW16-1**	**MW16-1 Lab-Dup**	**MW16-2**	**MW16-3**	**MW16-4**	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/L	<0.071		<0.071	<0.071	<0.071	<0.071	0.071	4387537
Polyaromatic Hydrocarbons									
Biphenyl	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Benzo(a)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4389615
Benzo(b/j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Naphthalene	ug/L	<0.050	<0.050	<0.050	0.060	<0.050	<0.050	0.050	4389615
Phenanthrene	ug/L	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4389615
Pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4389615
Surrogate Recovery (%)									
D10-Anthracene	%	86	87	82	85	85	86		4389615
D14-Terphenyl (FS)	%	83	84	81	83	85	86		4389615
D8-Acenaphthylene	%	73	75	74	73	76	75		4389615

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 VOCS & F1-F4 (WATER)

Maxxam ID		BWP031	BWP032	BWP033	BWP034	BWP035		
Sampling Date		2016/02/18 13:00	2016/02/18 14:00	2016/02/18 14:30	2016/02/18 15:00	2016/02/18 13:00		
COC Number		548176-07-01	548176-07-01	548176-07-01	548176-07-01	548176-07-01		
	UNITS	**MW16-1**	**MW16-2**	**MW16-3**	**MW16-4**	**DUP-1**	**RDL**	**QC Batch**
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4387495
Volatile Organics								
Acetone (2-Propanone)	ug/L	<10	<10	<10	<10	<10	10	4391137
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4391137
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Chloroform	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4391137
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	4391137
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	4391137
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4391137
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	4391137
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	<10	<10	10	4391137
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	4391137
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Toluene	ug/L	<0.20	<0.20	0.22	0.77	<0.20	0.20	4391137

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

O.REG 153 VOCS & F1-F4 (WATER)

Maxxam ID		BWP031	BWP032	BWP033	BWP034	BWP035		
Sampling Date		2016/02/18 13:00	2016/02/18 14:00	2016/02/18 14:30	2016/02/18 15:00	2016/02/18 13:00		
COC Number		548176-07-01	548176-07-01	548176-07-01	548176-07-01	548176-07-01		
	UNITS	**MW16-1**	**MW16-2**	**MW16-3**	**MW16-4**	**DUP-1**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4391137
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	0.32	<0.20	0.20	4391137
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4391137
Total Xylenes	ug/L	<0.20	<0.20	<0.20	0.32	<0.20	0.20	4391137
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	25	4392115
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	25	4392115
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	4393199
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	4393199
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	4393199
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		4393199
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	102	102	102	101	101		4392115
4-Bromofluorobenzene	%	100	100	99	99	99		4392115
D10-Ethylbenzene	%	99	103	101	101	102		4392115
D4-1,2-Dichloroethane	%	102	102	101	102	101		4392115
o-Terphenyl	%	105	104	103	105	106		4393199
4-Bromofluorobenzene	%	93	92	92	93	92		4391137
D4-1,2-Dichloroethane	%	102	105	103	103	104		4391137
D8-Toluene	%	92	93	93	92	94		4391137

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Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWP031
Sample ID: MW16-1
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4387537	N/A	2016/02/24	Paul Rubinato
1,3-Dichloropropene Sum	CALC	4387495	N/A	2016/02/25	Automated Statchk
Chloride by Automated Colourimetry	KONE	4389134	N/A	2016/02/22	Deonarine Ramnarine
Chromium (VI) in Water	IC	4389245	N/A	2016/02/22	Manoj Gera
Free (WAD) Cyanide	TECH/CN	4388981	N/A	2016/02/22	Christine Pham
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4392115	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4393199	2016/02/24	2016/02/25	Zhiyue (Frank) Zhu
Mercury	CV/AA	4392978	2016/02/24	2016/02/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4389274	N/A	2016/02/23	Prempal Bhatti
OC Pesticides (Selected) & PCB	GC/ECD	4389579	2016/02/22	2016/02/23	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4387536	N/A	2016/02/23	Automated Statchk
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4389615	2016/02/22	2016/02/22	Liliana Gaburici
Volatile Organic Compounds in Water	GC/MS	4391137	N/A	2016/02/24	Blair Gannon

Maxxam ID: BWP031 Dup
Sample ID: MW16-1
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4389615	2016/02/22	2016/02/22	Liliana Gaburici

Maxxam ID: BWP032
Sample ID: MW16-2
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4387537	N/A	2016/02/24	Paul Rubinato
1,3-Dichloropropene Sum	CALC	4387495	N/A	2016/02/25	Automated Statchk
Chloride by Automated Colourimetry	KONE	4389134	N/A	2016/02/22	Deonarine Ramnarine
Chromium (VI) in Water	IC	4389245	N/A	2016/02/22	Manoj Gera
Free (WAD) Cyanide	TECH/CN	4388981	N/A	2016/02/22	Christine Pham
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4392115	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4393199	2016/02/24	2016/02/25	Zhiyue (Frank) Zhu
Mercury	CV/AA	4392978	2016/02/24	2016/02/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4389274	N/A	2016/02/23	Prempal Bhatti
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4389615	2016/02/22	2016/02/22	Liliana Gaburici
Volatile Organic Compounds in Water	GC/MS	4391137	N/A	2016/02/24	Blair Gannon

Maxxam ID: BWP033
Sample ID: MW16-3
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4387537	N/A	2016/02/24	Paul Rubinato
1,3-Dichloropropene Sum	CALC	4387495	N/A	2016/02/25	Automated Statchk
Chloride by Automated Colourimetry	KONE	4389134	N/A	2016/02/22	Deonarine Ramnarine

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Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWP033
Sample ID: MW16-3
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	4389245	N/A	2016/02/22	Manoj Gera
Free (WAD) Cyanide	TECH/CN	4388981	N/A	2016/02/22	Christine Pham
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4392115	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4393199	2016/02/24	2016/02/25	Zhiyue (Frank) Zhu
Mercury	CV/AA	4392978	2016/02/24	2016/02/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4389277	N/A	2016/02/23	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4389615	2016/02/22	2016/02/22	Liliana Gaburici
Volatile Organic Compounds in Water	GC/MS	4391137	N/A	2016/02/24	Blair Gannon

Maxxam ID: BWP034
Sample ID: MW16-4
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4387537	N/A	2016/02/24	Paul Rubinato
1,3-Dichloropropene Sum	CALC	4387495	N/A	2016/02/25	Automated Statchk
Chloride by Automated Colourimetry	KONE	4389134	N/A	2016/02/22	Deonarine Ramnarine
Chromium (VI) in Water	IC	4389245	N/A	2016/02/22	Manoj Gera
Free (WAD) Cyanide	TECH/CN	4388981	N/A	2016/02/22	Christine Pham
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4392115	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4393199	2016/02/24	2016/02/25	Zhiyue (Frank) Zhu
Mercury	CV/AA	4392978	2016/02/24	2016/02/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4389274	N/A	2016/02/23	Prempal Bhatti
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4389615	2016/02/22	2016/02/22	Liliana Gaburici
Volatile Organic Compounds in Water	GC/MS	4391137	N/A	2016/02/24	Blair Gannon

Maxxam ID: BWP035
Sample ID: DUP-1
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4387537	N/A	2016/02/24	Paul Rubinato
1,3-Dichloropropene Sum	CALC	4387495	N/A	2016/02/25	Automated Statchk
Chloride by Automated Colourimetry	KONE	4389134	N/A	2016/02/22	Deonarine Ramnarine
Chromium (VI) in Water	IC	4389239	N/A	2016/02/22	Manoj Gera
Free (WAD) Cyanide	TECH/CN	4391666	N/A	2016/02/23	Christine Pham
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4392115	N/A	2016/02/24	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4393199	2016/02/24	2016/02/25	Zhiyue (Frank) Zhu
Mercury	CV/AA	4392978	2016/02/24	2016/02/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4389274	N/A	2016/02/23	Prempal Bhatti
OC Pesticides (Selected) & PCB	GC/ECD	4389579	2016/02/22	2016/02/23	Farahnaz Somwaru
OC Pesticides Summed Parameters	CALC	4387536	N/A	2016/02/23	Automated Statchk
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4389615	2016/02/22	2016/02/22	Liliana Gaburici
Volatile Organic Compounds in Water	GC/MS	4391137	N/A	2016/02/24	Blair Gannon

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Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

TEST SUMMARY

Maxxam ID: BWP035 Dup
Sample ID: DUP-1
Matrix: Water

Collected: 2016/02/18
Shipped:
Received: 2016/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4389134	N/A	2016/02/22	Deonarine Ramnarine

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Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
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Sampler Initials: CD

GENERAL COMMENTS

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

Package 1	6.0°C
Package 2	6.7°C

Custody seal was present and intact on the cooler.

Results relate only to the items tested.

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Maxxam Job #: B634115
Report Date: 2016/02/25

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4389579	2,4,5,6-Tetrachloro-m-xylene	2016/02/23	51	50 - 130	62	50 - 130	61	%		
4389579	Decachlorobiphenyl	2016/02/23	111	50 - 130	123	50 - 130	120	%		
4389615	D10-Anthracene	2016/02/22	85	50 - 130	86	50 - 130	82	%		
4389615	D14-Terphenyl (FS)	2016/02/22	78	50 - 130	80	50 - 130	79	%		
4389615	D8-Acenaphthylene	2016/02/22	74	50 - 130	74	50 - 130	71	%		
4391137	4-Bromofluorobenzene	2016/02/24	103	70 - 130	104	70 - 130	98	%		
4391137	D4-1,2-Dichloroethane	2016/02/24	98	70 - 130	99	70 - 130	102	%		
4391137	D8-Toluene	2016/02/24	102	70 - 130	102	70 - 130	94	%		
4392115	1,4-Difluorobenzene	2016/02/24	100	70 - 130	100	70 - 130	99	%		
4392115	4-Bromofluorobenzene	2016/02/24	101	70 - 130	100	70 - 130	98	%		
4392115	D10-Ethylbenzene	2016/02/24	98	70 - 130	96	70 - 130	98	%		
4392115	D4-1,2-Dichloroethane	2016/02/24	102	70 - 130	102	70 - 130	101	%		
4393199	o-Terphenyl	2016/02/25	108	60 - 130	105	60 - 130	103	%		
4388981	Free Cyanide	2016/02/22	103	80 - 120	105	80 - 120	<2	ug/L	NC	20
4389134	Dissolved Chloride (Cl)	2016/02/22	NC	80 - 120	103	80 - 120	<1.0	mg/L	0.46	20
4389239	Chromium (VI)	2016/02/22	101	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
4389245	Chromium (VI)	2016/02/22	105	80 - 120	102	80 - 120	<0.50	ug/L	NC	20
4389274	Dissolved Antimony (Sb)	2016/02/23	112	80 - 120	109	80 - 120	<0.50	ug/L	NC	20
4389274	Dissolved Arsenic (As)	2016/02/23	107	80 - 120	103	80 - 120	<1.0	ug/L	NC	20
4389274	Dissolved Barium (Ba)	2016/02/23	NC	80 - 120	102	80 - 120	<2.0	ug/L	0.10	20
4389274	Dissolved Beryllium (Be)	2016/02/23	108	80 - 120	109	80 - 120	<0.50	ug/L	NC	20
4389274	Dissolved Boron (B)	2016/02/23	NC	80 - 120	103	80 - 120	<10	ug/L	1.4	20
4389274	Dissolved Cadmium (Cd)	2016/02/23	107	80 - 120	108	80 - 120	<0.10	ug/L	NC	20
4389274	Dissolved Chromium (Cr)	2016/02/23	107	80 - 120	102	80 - 120	<5.0	ug/L	NC	20
4389274	Dissolved Cobalt (Co)	2016/02/23	109	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
4389274	Dissolved Copper (Cu)	2016/02/23	100	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
4389274	Dissolved Lead (Pb)	2016/02/23	99	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
4389274	Dissolved Molybdenum (Mo)	2016/02/23	118	80 - 120	107	80 - 120	<0.50	ug/L	2.9	20
4389274	Dissolved Nickel (Ni)	2016/02/23	106	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
4389274	Dissolved Selenium (Se)	2016/02/23	106	80 - 120	105	80 - 120	<2.0	ug/L	NC	20
4389274	Dissolved Silver (Ag)	2016/02/23	77 (1)	80 - 120	104	80 - 120	0.12, RDL=0.10	ug/L	NC	20

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Maxxam Job #: B634115
Report Date: 2016/02/25

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4389274	Dissolved Sodium (Na)	2016/02/23	NC	80 - 120	103	80 - 120	<100	ug/L	0.10	20
4389274	Dissolved Thallium (Tl)	2016/02/23	98	80 - 120	101	80 - 120	<0.050	ug/L	NC	20
4389274	Dissolved Uranium (U)	2016/02/23	105	80 - 120	102	80 - 120	<0.10	ug/L	NC	20
4389274	Dissolved Vanadium (V)	2016/02/23	113	80 - 120	103	80 - 120	0.89, RDL=0.50	ug/L	NC	20
4389274	Dissolved Zinc (Zn)	2016/02/23	94	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
4389277	Dissolved Antimony (Sb)	2016/02/23	101	80 - 120	99	80 - 120	<0.50	ug/L		
4389277	Dissolved Arsenic (As)	2016/02/23	97	80 - 120	96	80 - 120	<1.0	ug/L		
4389277	Dissolved Barium (Ba)	2016/02/23	96	80 - 120	97	80 - 120	<2.0	ug/L		
4389277	Dissolved Beryllium (Be)	2016/02/23	99	80 - 120	98	80 - 120	<0.50	ug/L		
4389277	Dissolved Boron (B)	2016/02/23	96	80 - 120	97	80 - 120	<10	ug/L	NC	20
4389277	Dissolved Cadmium (Cd)	2016/02/23	99	80 - 120	97	80 - 120	<0.10	ug/L		
4389277	Dissolved Chromium (Cr)	2016/02/23	95	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
4389277	Dissolved Cobalt (Co)	2016/02/23	95	80 - 120	96	80 - 120	<0.50	ug/L		
4389277	Dissolved Copper (Cu)	2016/02/23	97	80 - 120	97	80 - 120	<1.0	ug/L		
4389277	Dissolved Lead (Pb)	2016/02/23	93	80 - 120	95	80 - 120	<0.50	ug/L		
4389277	Dissolved Molybdenum (Mo)	2016/02/23	101	80 - 120	99	80 - 120	<0.50	ug/L		
4389277	Dissolved Nickel (Ni)	2016/02/23	95	80 - 120	98	80 - 120	<1.0	ug/L		
4389277	Dissolved Selenium (Se)	2016/02/23	96	80 - 120	97	80 - 120	<2.0	ug/L		
4389277	Dissolved Silver (Ag)	2016/02/23	95	80 - 120	95	80 - 120	<0.10	ug/L		
4389277	Dissolved Sodium (Na)	2016/02/23	NC	80 - 120	96	80 - 120	<100	ug/L	0.51	20
4389277	Dissolved Thallium (Tl)	2016/02/23	93	80 - 120	94	80 - 120	<0.050	ug/L		
4389277	Dissolved Uranium (U)	2016/02/23	94	80 - 120	94	80 - 120	<0.10	ug/L		
4389277	Dissolved Vanadium (V)	2016/02/23	98	80 - 120	97	80 - 120	<0.50	ug/L		
4389277	Dissolved Zinc (Zn)	2016/02/23	96	80 - 120	96	80 - 120	<5.0	ug/L		
4389579	a-Chlordane	2016/02/23	84	50 - 130	96	50 - 130	<0.005	ug/L	NC	30
4389579	Aldrin	2016/02/23	73	50 - 130	81	50 - 130	<0.005	ug/L	NC	30
4389579	Aroclor 1242	2016/02/23					<0.05	ug/L	NC	30
4389579	Aroclor 1248	2016/02/23					<0.05	ug/L		
4389579	Aroclor 1254	2016/02/23					<0.05	ug/L		
4389579	Aroclor 1260	2016/02/23					<0.05	ug/L		
4389579	Dieldrin	2016/02/23	92	50 - 130	110	50 - 130	<0.005	ug/L	NC	30

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Maxxam Job #: B634115
Report Date: 2016/02/25

QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4389579	Endosulfan I (alpha)	2016/02/23	76	50 - 130	88	50 - 130	<0.005	ug/L		
4389579	Endosulfan II (beta)	2016/02/23	87	50 - 130	97	50 - 130	<0.005	ug/L		
4389579	Endrin	2016/02/23	81	50 - 130	94	50 - 130	<0.005	ug/L		
4389579	g-Chlordane	2016/02/23	81	50 - 130	93	50 - 130	<0.005	ug/L	NC	30
4389579	Heptachlor epoxide	2016/02/23	80	50 - 130	94	50 - 130	<0.005	ug/L		
4389579	Heptachlor	2016/02/23	73	50 - 130	100	50 - 130	<0.005	ug/L		
4389579	Hexachlorobenzene	2016/02/23	83	50 - 130	93	50 - 130	<0.005	ug/L	NC	30
4389579	Hexachlorobutadiene	2016/02/23	71	50 - 130	73	50 - 130	<0.009	ug/L		
4389579	Hexachloroethane	2016/02/23	73	50 - 130	71	50 - 130	<0.01	ug/L		
4389579	Lindane	2016/02/23	75	50 - 130	85	50 - 130	<0.003	ug/L	NC	30
4389579	Methoxychlor	2016/02/23	125	50 - 130	128	50 - 130	<0.01	ug/L		
4389579	o,p-DDD	2016/02/23	101	50 - 130	113	50 - 130	<0.005	ug/L		
4389579	o,p-DDE	2016/02/23	89	50 - 130	100	50 - 130	<0.005	ug/L		
4389579	o,p-DDT	2016/02/23	93	50 - 130	101	50 - 130	<0.005	ug/L	NC	30
4389579	p,p-DDD	2016/02/23	92	50 - 130	108	50 - 130	<0.005	ug/L		
4389579	p,p-DDE	2016/02/23	86	50 - 130	96	50 - 130	<0.005	ug/L		
4389579	p,p-DDT	2016/02/23	107	50 - 130	116	50 - 130	<0.005	ug/L	NC	30
4389615	1-Methylnaphthalene	2016/02/22	108	50 - 130	81	50 - 130	<0.050	ug/L	NC	30
4389615	2-Methylnaphthalene	2016/02/22	107	50 - 130	77	50 - 130	<0.050	ug/L	NC	30
4389615	Acenaphthene	2016/02/22	101	50 - 130	78	50 - 130	<0.050	ug/L	NC	30
4389615	Acenaphthylene	2016/02/22	93	50 - 130	69	50 - 130	<0.050	ug/L	NC	30
4389615	Anthracene	2016/02/22	106	50 - 130	81	50 - 130	<0.050	ug/L	NC	30
4389615	Benzo(a)anthracene	2016/02/22	113	50 - 130	81	50 - 130	<0.050	ug/L	NC	30
4389615	Benzo(a)pyrene	2016/02/22	115	50 - 130	84	50 - 130	<0.010	ug/L	NC	30
4389615	Benzo(b/j)fluoranthene	2016/02/22	60	50 - 130	88	50 - 130	<0.050	ug/L	NC	30
4389615	Benzo(g,h,i)perylene	2016/02/22	112	50 - 130	84	50 - 130	<0.050	ug/L	NC	30
4389615	Benzo(k)fluoranthene	2016/02/22	110	50 - 130	84	50 - 130	<0.050	ug/L	NC	30
4389615	Biphenyl	2016/02/22					<0.050	ug/L	NC	30
4389615	Chrysene	2016/02/22	107	50 - 130	80	50 - 130	<0.050	ug/L	NC	30
4389615	Dibenz(a,h)anthracene	2016/02/22	111	50 - 130	82	50 - 130	<0.050	ug/L	NC	30
4389615	Fluoranthene	2016/02/22	103	50 - 130	76	50 - 130	<0.050	ug/L	NC	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4389615	Fluorene	2016/02/22	103	50 - 130	78	50 - 130	<0.050	ug/L	NC	30
4389615	Indeno(1,2,3-cd)pyrene	2016/02/22	116	50 - 130	89	50 - 130	<0.050	ug/L	NC	30
4389615	Naphthalene	2016/02/22	104	50 - 130	77	50 - 130	<0.050	ug/L	NC	30
4389615	Phenanthrene	2016/02/22	106	50 - 130	77	50 - 130	<0.030	ug/L	NC	30
4389615	Pyrene	2016/02/22	105	50 - 130	79	50 - 130	<0.050	ug/L	NC	30
4391137	1,1,1,2-Tetrachloroethane	2016/02/24	97	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
4391137	1,1,1-Trichloroethane	2016/02/24	96	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
4391137	1,1,2,2-Tetrachloroethane	2016/02/24	113	70 - 130	111	70 - 130	<0.50	ug/L	NC	30
4391137	1,1,2-Trichloroethane	2016/02/24	95	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
4391137	1,1-Dichloroethane	2016/02/24	100	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
4391137	1,1-Dichloroethylene	2016/02/24	102	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
4391137	1,2-Dichlorobenzene	2016/02/24	94	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
4391137	1,2-Dichloroethane	2016/02/24	100	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
4391137	1,2-Dichloropropane	2016/02/24	98	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
4391137	1,3-Dichlorobenzene	2016/02/24	95	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
4391137	1,4-Dichlorobenzene	2016/02/24	98	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
4391137	Acetone (2-Propanone)	2016/02/24	98	60 - 140	102	60 - 140	<10	ug/L	NC	30
4391137	Benzene	2016/02/24	99	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
4391137	Bromodichloromethane	2016/02/24	99	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
4391137	Bromoform	2016/02/24	93	70 - 130	92	70 - 130	<1.0	ug/L	NC	30
4391137	Bromomethane	2016/02/24	91	60 - 140	87	60 - 140	<0.50	ug/L	NC	30
4391137	Carbon Tetrachloride	2016/02/24	102	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
4391137	Chlorobenzene	2016/02/24	102	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
4391137	Chloroform	2016/02/24	99	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
4391137	cis-1,2-Dichloroethylene	2016/02/24	102	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
4391137	cis-1,3-Dichloropropene	2016/02/24	104	70 - 130	98	70 - 130	<0.30	ug/L	NC	30
4391137	Dibromochloromethane	2016/02/24	97	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
4391137	Dichlorodifluoromethane (FREON 12)	2016/02/24	98	60 - 140	99	60 - 140	<1.0	ug/L	NC	30
4391137	Ethylbenzene	2016/02/24	101	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
4391137	Ethylene Dibromide	2016/02/24	98	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
4391137	Hexane	2016/02/24	108	70 - 130	106	70 - 130	<1.0	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4391137	Methyl Ethyl Ketone (2-Butanone)	2016/02/24	100	60 - 140	104	60 - 140	<10	ug/L	NC	30
4391137	Methyl Isobutyl Ketone	2016/02/24	99	70 - 130	101	70 - 130	<5.0	ug/L	NC	30
4391137	Methyl t-butyl ether (MTBE)	2016/02/24	98	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
4391137	Methylene Chloride(Dichloromethane)	2016/02/24	109	70 - 130	108	70 - 130	<2.0	ug/L	NC	30
4391137	o-Xylene	2016/02/24	99	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
4391137	p+m-Xylene	2016/02/24	100	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
4391137	Styrene	2016/02/24	102	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
4391137	Tetrachloroethylene	2016/02/24	101	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
4391137	Toluene	2016/02/24	101	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
4391137	Total Xylenes	2016/02/24					<0.20	ug/L	NC	30
4391137	trans-1,2-Dichloroethylene	2016/02/24	100	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
4391137	trans-1,3-Dichloropropene	2016/02/24	106	70 - 130	95	70 - 130	<0.40	ug/L	NC	30
4391137	Trichloroethylene	2016/02/24	97	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
4391137	Trichlorofluoromethane (FREON 11)	2016/02/24	103	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
4391137	Vinyl Chloride	2016/02/24	102	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
4391666	Free Cyanide	2016/02/23	104	80 - 120	109	80 - 120	<2	ug/L	NC	20
4392115	F1 (C6-C10) - BTEX	2016/02/24					<25	ug/L	NC	30
4392115	F1 (C6-C10)	2016/02/24	84	70 - 130	105	70 - 130	<25	ug/L	NC	30
4392978	Mercury (Hg)	2016/02/25	109	75 - 125	102	80 - 120	<0.1	ug/L	NC	20
4393199	F2 (C10-C16 Hydrocarbons)	2016/02/25	109	50 - 130	114	60 - 130	<100	ug/L	NC	30
4393199	F3 (C16-C34 Hydrocarbons)	2016/02/25	104	50 - 130	111	60 - 130	<200	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4393199	F4 (C34-C50 Hydrocarbons)	2016/02/25	98	50 - 130	104	60 - 130	<200	ug/L	NC	30

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B634115
Report Date: 2016/02/25

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: CD

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Specialist

Cristina Carriere, Scientific Services

Paul Rubinato, Analyst, Maxxam Analytics

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

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B60807	Maxxam Job #:	Bottle Order #: 548176
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #: C#548176-07-01	Project Manager: Parnian Baber
Tel:	(613) 721-0555 Fax: (613) 721-0029	Tel:	Fax:	Project Name:			
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	C. Davis		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☒ Table 5

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558. ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals & Inorganics Pkg (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs & F1-F4 (Soil)	O.Reg 153 OC Pesticides (Soil)	O.Reg 153 Metals & Inorganics Pkg (Wtr)	O.Reg 153 PAHs (Water)	O.Reg 153 VOCs & F1-F4 (Water)	O.Reg 153 OC Pesticides (Water)			# of Bottles	Comments
1		MW16-1	18/02/16	1PM	GW	Yes					X	X	X	X			16	
2		MW16-2	18/02/16	2 PM	GW	Yes					X	X	X				14	
3		MW16-3	18/02/16	2:30PM	GW	Yes					X	X	X				14	
4		MW16-4	18/02/16	3 PM	GW	Yes					X	X	X				14	
5		DUP-1	18/02/16	1PM	GW	Yes					X	X	X	X			16	
6																		
7																		
8																		
9																		
10																		

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

19-Feb-16 09:30
Parnian Baber
B634115
FHB OTT-001

RECEIVED IN OTTAWA

on ICE

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
Chris Davis	16/02/18	7:30pm	[illegible] Fatemeh	2016/02/19	9:30			6,4,8	Present	✓	
									Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

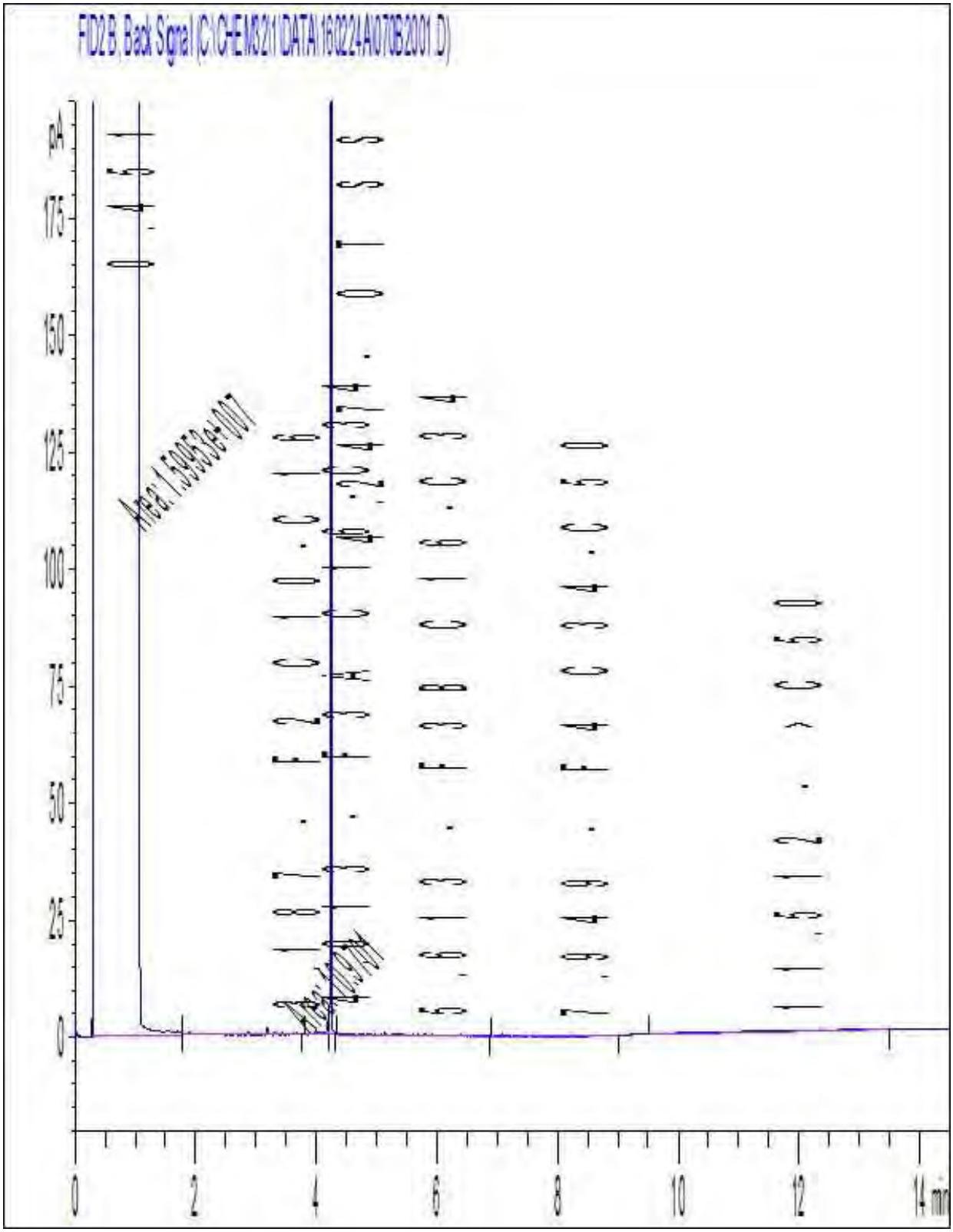
Maxxam Analytics International Corporation o/a Maxxam Analytics

7, 6, 7

Maxxam Job #: B634115
Report Date: 2016/02/25
Maxxam Sample: BWP031

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW16-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

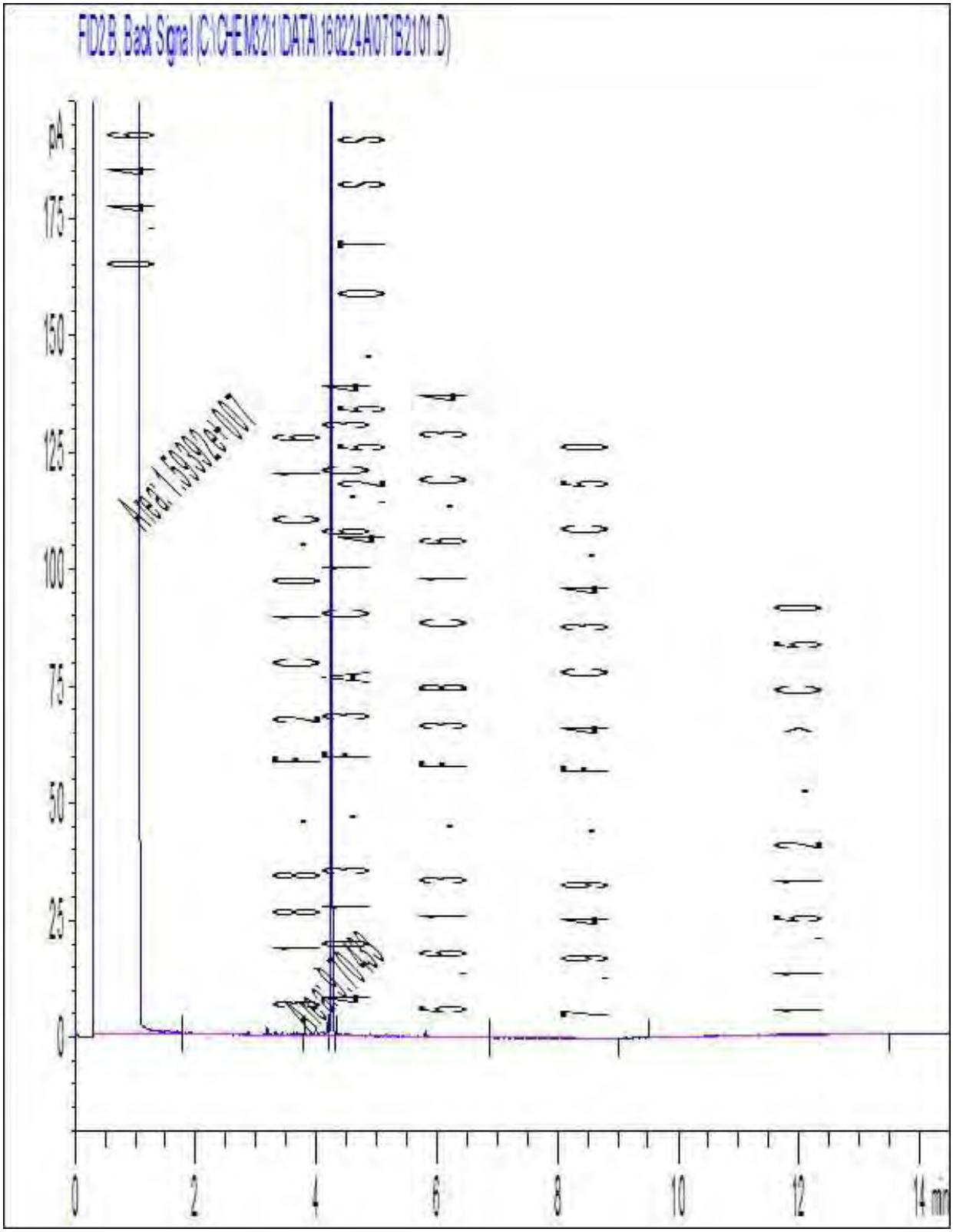


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B634115
Report Date: 2016/02/25
Maxxam Sample: BWP032

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW16-2

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

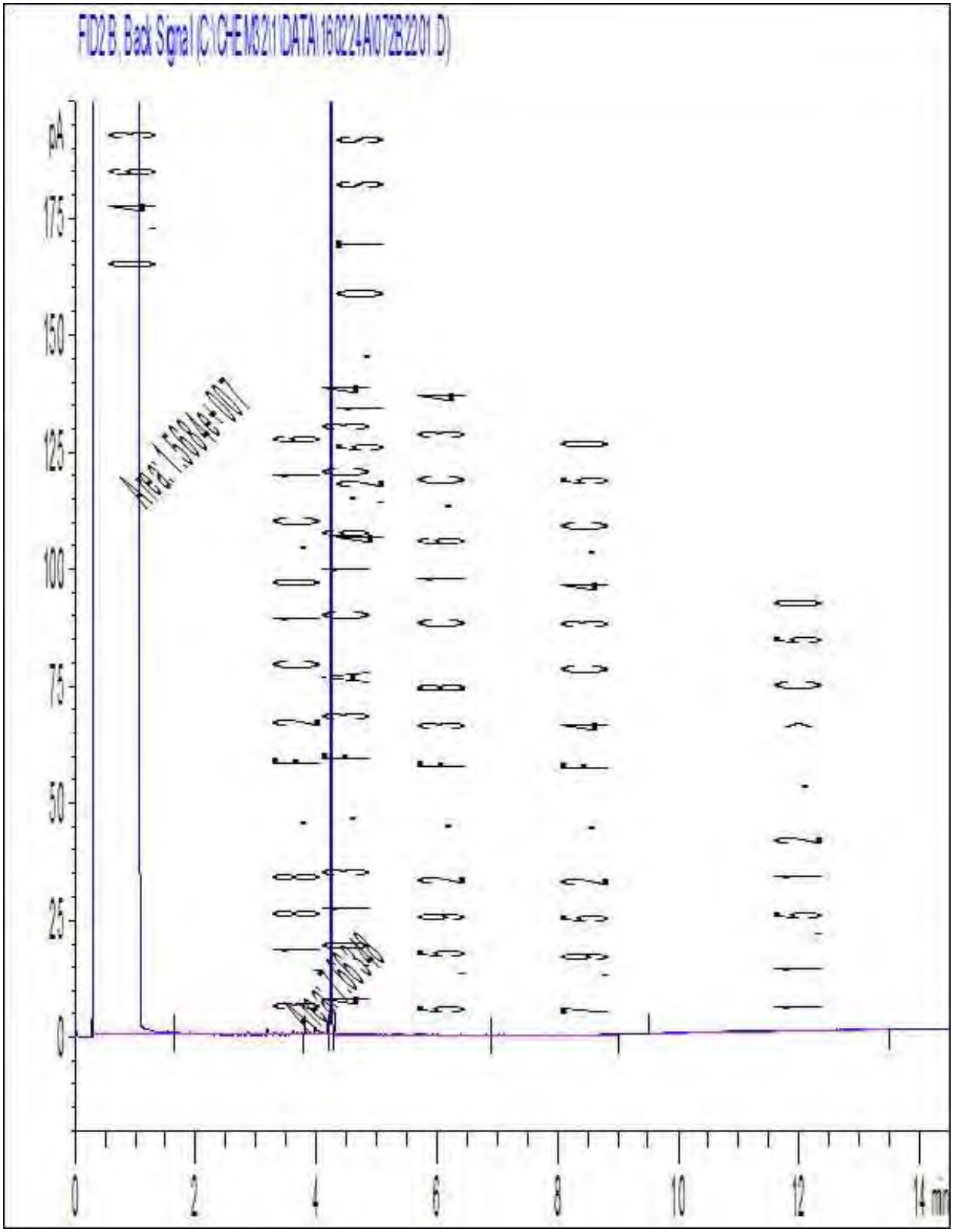


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B634115
Report Date: 2016/02/25
Maxxam Sample: BWP033

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW16-3

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

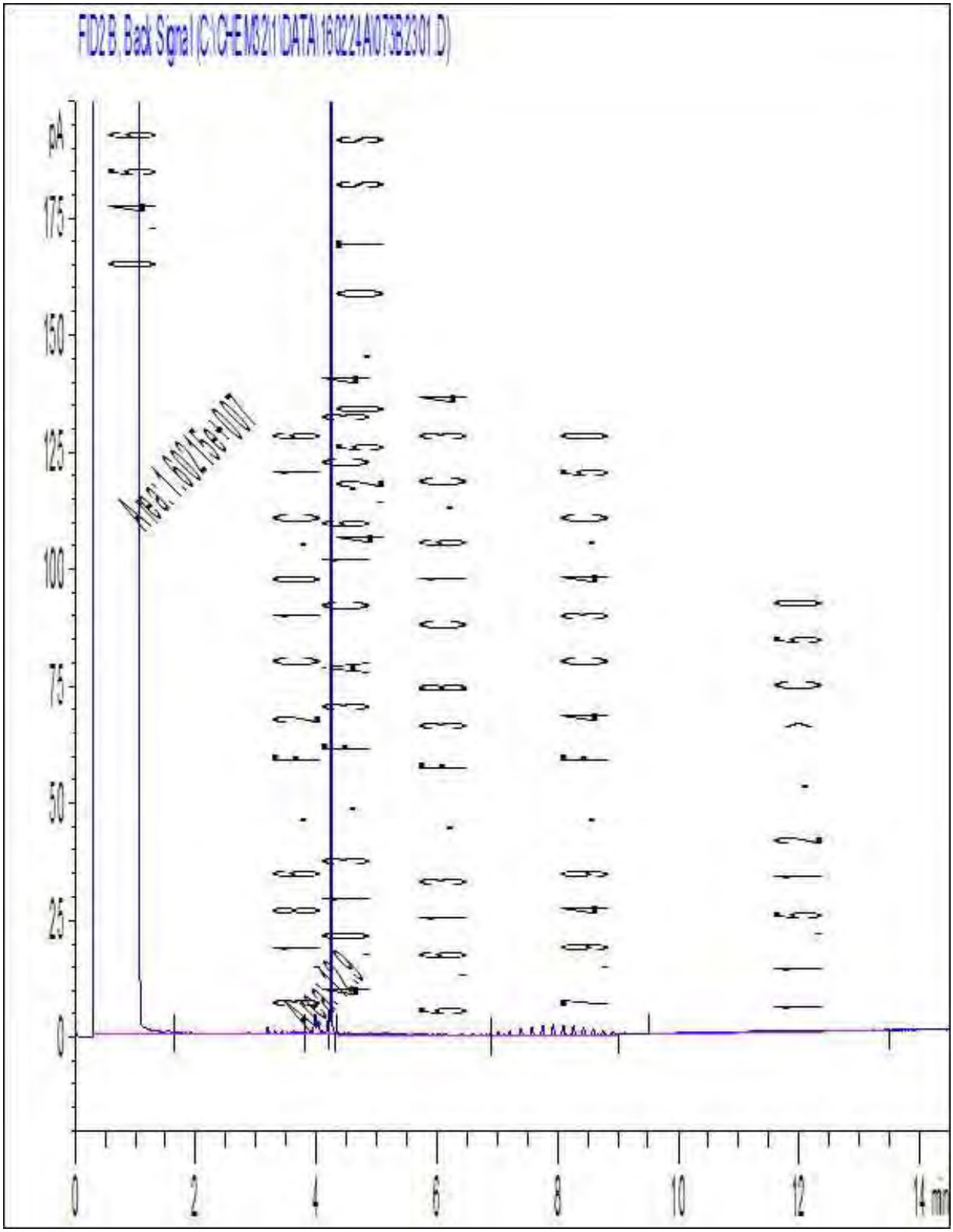


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B634115
Report Date: 2016/02/25
Maxxam Sample: BWP034

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW16-4

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

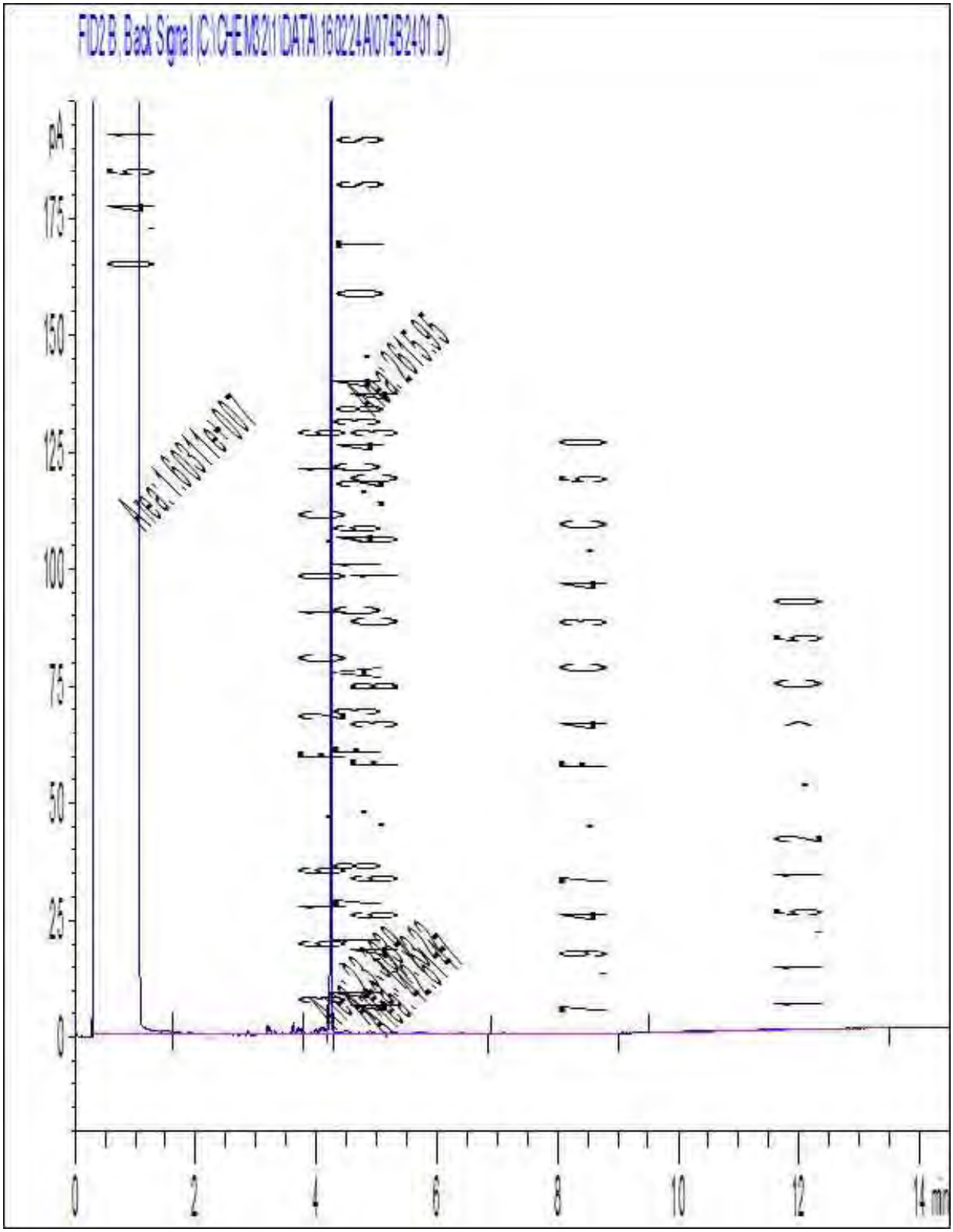


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B634115
Report Date: 2016/02/25
Maxxam Sample: BWP035

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: DUP-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



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

Your Project #: 250271
Site Location: TRIM RD. OTTAWA
Your C.O.C. #: na

Attention:Troy Austrins

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/09/06
Report #: R4688716
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I8163
Received: 2017/08/29, 09:00

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Chloride by Automated Colourimetry (1)	2	N/A	2017/09/01	CAM SOP-00463	EPA 325.2 m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B7I8163
Report Date: 2017/09/06

ARCADIS Canada Inc
Client Project #: 250271
Site Location: TRIM RD. OTTAWA
Sampler Initials: LDG

RESULTS OF ANALYSES OF WATER

Maxxam ID		FAP233	FAP234		
Sampling Date		2017/08/28 14:00	2017/08/28 14:00		
COC Number		na	na		
	UNITS	**BH/MW 17-11**	**DUP-8**	**RDL**	**QC Batch**
Inorganics					
Dissolved Chloride (Cl)	mg/L	73	72	1.0	5145887

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7I8163
Report Date: 2017/09/06

ARCADIS Canada Inc
Client Project #: 250271
Site Location: TRIM RD. OTTAWA
Sampler Initials: LDG

TEST SUMMARY

Maxxam ID: FAP233
Sample ID: BH/MW 17-11
Matrix: Water

Collected: 2017/08/28
Shipped:
Received: 2017/08/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5145887	N/A	2017/09/01	Deonarine Ramnarine

Maxxam ID: FAP234
Sample ID: DUP-8
Matrix: Water

Collected: 2017/08/28
Shipped:
Received: 2017/08/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5145887	N/A	2017/09/01	Deonarine Ramnarine

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Maxxam Job #: B7I8163
Report Date: 2017/09/06

ARCADIS Canada Inc
Client Project #: 250271
Site Location: TRIM RD. OTTAWA
Sampler Initials: LDG

GENERAL COMMENTS

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

Package 1	5.0°C

Results relate only to the items tested.

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Maxxam Job #: B7I8163
Report Date: 2017/09/06

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 250271
Site Location: TRIM RD. OTTAWA
Sampler Initials: LDG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5145887	Dissolved Chloride (Cl)	2017/09/01	102	80 - 120	103	80 - 120	<1.0	mg/L	NC	20

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

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

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

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

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

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Maxxam Job #: B7I8163
Report Date: 2017/09/06

ARCADIS Canada Inc
Client Project #: 250271
Site Location: TRIM RD. OTTAWA
Sampler Initials: LDG

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD

Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: Arcadis Canada	Company Name: see Invoice	Quotation #: Arcadis SOA	☒ Regular TAT (5-7 days) Most analyses
Contact Name: Troy Austrins	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 324 Churchill Av.	Address:	Project #: 4X0271	Rush TAT (Surcharges will be applied)
Phone: Fax:	Phone: Fax:	Site Location: Wim Rd. OTTAWA	☐ 1 Day ☐ 2 Days ☐ 3-4 Days
Email: Troy.Austrins@Arcadis.com	Email:	Site #:	Date Required:
		Sampled By: Lennart de Graf	Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153	Other Regulations
☐ Table 1 ☒ Res/Park ☐ Med/ Fine	☒ CCME ☐ Sanitary Sewer Bylaw
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ MISA ☐ Storm Sewer Bylaw
☐ Table 3 ☐ Agri/ Other	☐ PWQO Region
☐ Table ____	☐ Other (Specify)
FOR RSC (PLEASE CIRCLE) Y / N	☐ REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE): Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Chloride								HOLD- DO NOT ANALYZE
1	BH/MW 17-11	2017/08/29	14:00	G.W.		X							X								
2	Dup-8	"	14:00	G.W.		X							X								
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

29-Aug-17 09:00
Alison Cameron
B7I8163
SSR ENV-891

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
Y	Y	5.5.5

COOLING MEDIA PRESENT: (Y) / N

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
	2017/08/29	8:55am	Fatemeh Habibi	2017/08/29	09:00
			MARIE ZHU	2017/08/29	22:35

MAXXAM JOB #

RECEIVED IN OTTAWA

5/6/5

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271
Site Location: TRIM ROAD
Your C.O.C. #: 098216

Attention:Troy Austrins

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/09/01
Report #: R4685181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I5566
Received: 2017/08/25, 11:00

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	3	N/A	2017/08/29	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	3	2017/08/30	2017/08/30	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	3	2017/09/01	2017/09/01	CAM SOP-00316	CCME PHC-CWS m
Moisture (1)	3	N/A	2017/08/29	CAM SOP-00445	Carter 2nd ed 51.2 m

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Metals Analysis by ICPMS (1)	2	N/A	2017/08/31	CAM SOP-00447	EPA 6020B m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Your Project #: 450271
Site Location: TRIM ROAD
Your C.O.C. #: 098216

Attention:Troy Austrins

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/09/01
Report #: R4685181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I5566
Received: 2017/08/25, 11:00

(1) This test was performed by Maxxam Analytics Mississauga
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		FAB691	FAB692	FAB692	FAB693		
Sampling Date		2017/08/25 10:00	2017/08/25 10:30	2017/08/25 10:30	2017/08/25		
COC Number		098216	098216	098216	098216		
	UNITS	**SP203-1**	**SP203-2**	**SP203-2 Lab-Dup**	**DUP-7**	**RDL**	**QC Batch**
Inorganics							
Moisture	%	4.6	3.2	3.3	4.8	1.0	5140588
BTEX & F1 Hydrocarbons							
Benzene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
Toluene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
Ethylbenzene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
o-Xylene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
p+m-Xylene	ug/g	<0.040	<0.040		<0.040	0.040	5139558
Total Xylenes	ug/g	<0.040	<0.040		<0.040	0.040	5139558
F1 (C6-C10)	ug/g	<10	<10		<10	10	5139558
F1 (C6-C10) - BTEX	ug/g	<10	<10		<10	10	5139558
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10		<10	10	5143136
F3 (C16-C34 Hydrocarbons)	ug/g	53	91		54	50	5143136
F4 (C34-C50 Hydrocarbons)	ug/g	60	170		71	50	5143136
Reached Baseline at C50	ug/g	No	No		No		5143136
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	101	99		99		5139558
4-Bromofluorobenzene	%	109	107		106		5139558
D10-Ethylbenzene	%	93	90		94		5139558
D4-1,2-Dichloroethane	%	93	94		92		5139558
o-Terphenyl	%	108	109		108		5143136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FAB691	FAB692	FAB693		
Sampling Date		2017/08/25 10:00	2017/08/25 10:30	2017/08/25		
COC Number		098216	098216	098216		
	UNITS	**SP203-1**	**SP203-2**	**DUP-7**	**RDL**	**QC Batch**
F2-F4 Hydrocarbons						
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	140	580	350	100	5146413

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		FAB690	FAB694		
Sampling Date		2017/08/25 10:00	2017/08/25		
COC Number		098216	098216		
	UNITS	**BH/MW 17-11**	**DUP-8**	**RDL**	**QC Batch**
Metals					
Total Uranium (U)	ug/L	9.2	9.3	0.10	5140383

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

TEST SUMMARY

Maxxam ID: FAB690
Sample ID: BH/MW 17-11
Matrix: Water

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	5140383	N/A	2017/08/31	Matthew Ritenburg

Maxxam ID: FAB691
Sample ID: SP203-1
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5139558	N/A	2017/08/29	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5143136	2017/08/30	2017/08/30	Atoosa Keshavarz
F4G (CCME Hydrocarbons Gravimetric)	BAL	5146413	2017/09/01	2017/09/01	Debra Deslandes
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB692
Sample ID: SP203-2
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5139558	N/A	2017/08/29	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5143136	2017/08/30	2017/08/30	Atoosa Keshavarz
F4G (CCME Hydrocarbons Gravimetric)	BAL	5146413	2017/09/01	2017/09/01	Debra Deslandes
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB692 Dup
Sample ID: SP203-2
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB693
Sample ID: DUP-7
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5139558	N/A	2017/08/29	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5143136	2017/08/30	2017/08/30	Atoosa Keshavarz
F4G (CCME Hydrocarbons Gravimetric)	BAL	5146413	2017/09/01	2017/09/01	Debra Deslandes
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB694
Sample ID: DUP-8
Matrix: Water

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	5140383	N/A	2017/08/31	Matthew Ritenburg

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

GENERAL COMMENTS

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

Package 1	22.0°C

Results relate only to the items tested.

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5139558	1,4-Difluorobenzene	2017/08/28	101	60 - 140	102	60 - 140	97	%		
5139558	4-Bromofluorobenzene	2017/08/28	106	60 - 140	104	60 - 140	102	%		
5139558	D10-Ethylbenzene	2017/08/28	89	60 - 140	89	60 - 140	90	%		
5139558	D4-1,2-Dichloroethane	2017/08/28	92	60 - 140	96	60 - 140	88	%		
5143136	o-Terphenyl	2017/08/30	112	60 - 130	104	60 - 130	110	%		
5139558	Benzene	2017/08/28	83	60 - 140	90	60 - 140	<0.020	ug/g	NC	50
5139558	Ethylbenzene	2017/08/28	92	60 - 140	96	60 - 140	<0.020	ug/g	NC	50
5139558	F1 (C6-C10) - BTEX	2017/08/28					<10	ug/g	NC	30
5139558	F1 (C6-C10)	2017/08/28	87	60 - 140	89	80 - 120	<10	ug/g	NC	30
5139558	o-Xylene	2017/08/28	95	60 - 140	99	60 - 140	<0.020	ug/g	NC	50
5139558	p+m-Xylene	2017/08/28	92	60 - 140	95	60 - 140	<0.040	ug/g	NC	50
5139558	Toluene	2017/08/28	86	60 - 140	88	60 - 140	<0.020	ug/g	NC	50
5139558	Total Xylenes	2017/08/28					<0.040	ug/g	NC	50
5140383	Total Uranium (U)	2017/08/31	98	80 - 120	97	80 - 120	<0.10	ug/L		
5140588	Moisture	2017/08/29							3.1	20
5143136	F2 (C10-C16 Hydrocarbons)	2017/08/30	108	50 - 130	104	80 - 120	<10	ug/g	NC	30
5143136	F3 (C16-C34 Hydrocarbons)	2017/08/30	NC	50 - 130	107	80 - 120	<50	ug/g	67 (1)	30
5143136	F4 (C34-C50 Hydrocarbons)	2017/08/30	112	50 - 130	111	80 - 120	<50	ug/g		
5146413	F4G-sg (Grav. Heavy Hydrocarbons)	2017/09/01	71	65 - 135	99	65 - 135	<100	ug/g	NC	50

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

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

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

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

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

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

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

(1) Duplicate results exceeded RPD acceptance criteria for flagged analytes. The sample was reanalyzed with the same result. This is likely due to sample heterogeneity.

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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

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Maxxam
A Bureau Veritas Group Company

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD 098216 Page 1 of 1

Invoice Information
Company Name: Arcadis Canada
Contact Name: Troy Austrins
Address: 329 Churchill AV. OTTAWA
Phone: Fax:
Email: Troy.Austrins@Arcadis.com

Report Information (if differs from invoice)
Company Name: Same.
Contact Name:
Address:
Phone: Fax:
Email:

Project Information (where applicable)
Quotation #: Arcadis sop.
P.O. #/ AFE#:
Project #: 450271
Site Location: Trim Road
Site #:
Sampled By: Lennart de Graaf

Turnaround Time (TAT) Required
[X] Regular TAT (5-7 days) Most analyses
PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Rush TAT (Surcharges will be applied)
[X] 1 Day [ ] 2 Days [ ] 3-4 Days
Date Required:
Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153
[ ] Table 1 [X] Res/Park [ ] Med/ Fine
[ ] Table 2 [ ] Ind/Comm [ ] Coarse
[ ] Table 3 [ ] Agri/ Other
[ ] Table ____
FOR RSC (PLEASE CIRCLE) Y / N

Other Regulations
[X] CCME [ ] Sanitary Sewer Bylaw
[ ] MISA [ ] Storm Sewer Bylaw
[ ] PWQO Region
[ ] Other (Specify)
[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE): Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Chloride + Uranium									HOLD- DO NOT ANALYZE
1	BH/MW17-11	2017-08-25	10:00	GW	1	X							X	X								
2																						
3	SP203-1	2017-08-25	10:00	Soil	4		X	X														
4	SP203-2	"	10:30	Soil	4		X	X														
5																						
6	DUP-7	2017-08-25		Soil	4		X	X														
7	DUP-8	"		GW	1	X							X	X								
8																						
9																						
10																						

RECEIVED IN OTTAWA
25-Aug-17 11:00
Alison Cameron
B7I5566
SSR ENV-581

On ice pack

LABORATORY USE ONLY
CUSTODY SEAL Y / N
COOLER TEMPERATURES

Present	Intact	
Y	Y	22, 22, 23
Y	Y	8/7/8

COOLING MEDIA PRESENT: Y / N

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Lennart de Graaf	2017-08-25	11:00	Mariana Damian Kaszan	2017/08/25	11:00
			[signature]	2017/08/25	22:45

MAXXAM JOB #

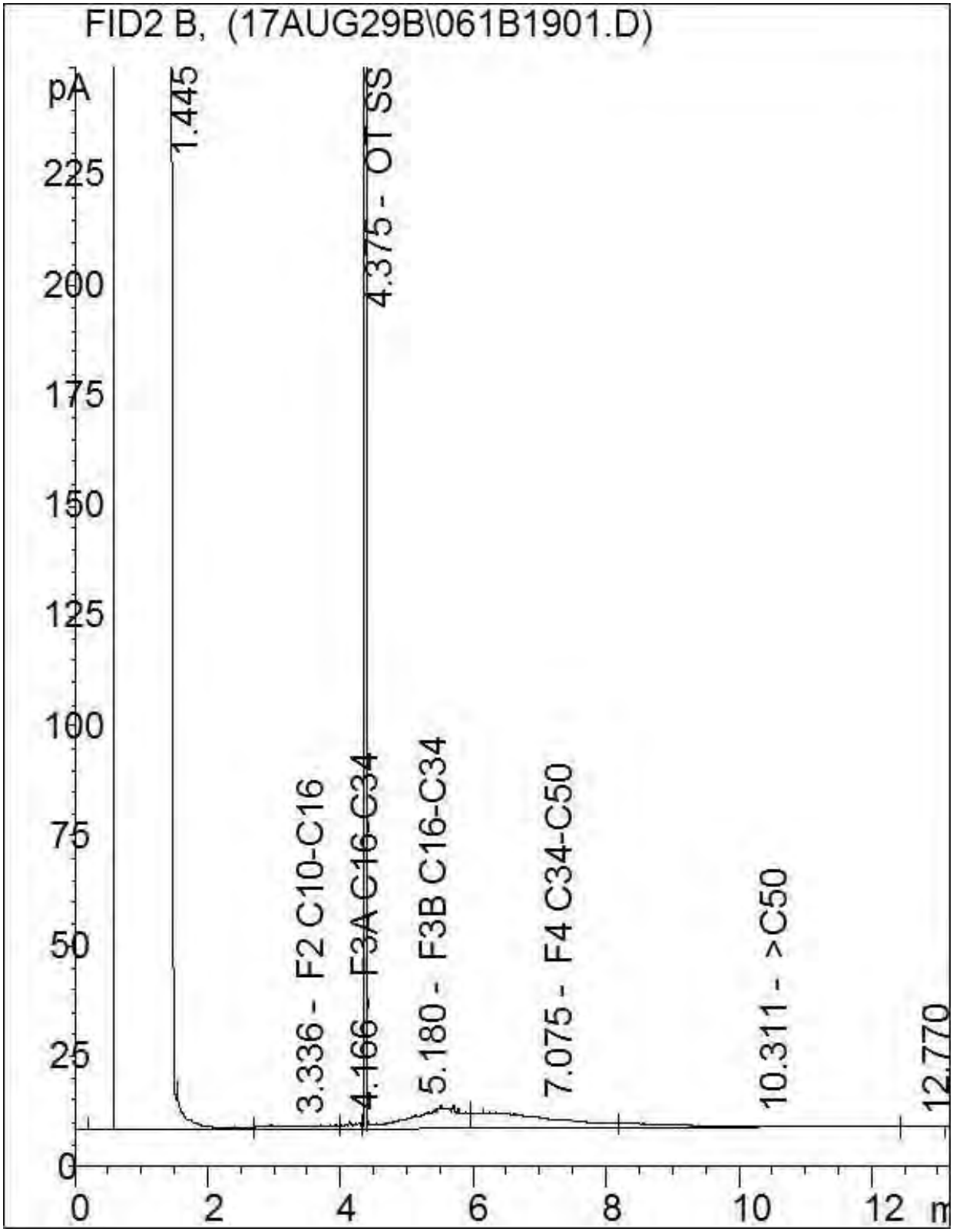
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

Maxxam Job #: B7I5566
Report Date: 2017/09/01
Maxxam Sample: FAB691

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: SP203-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

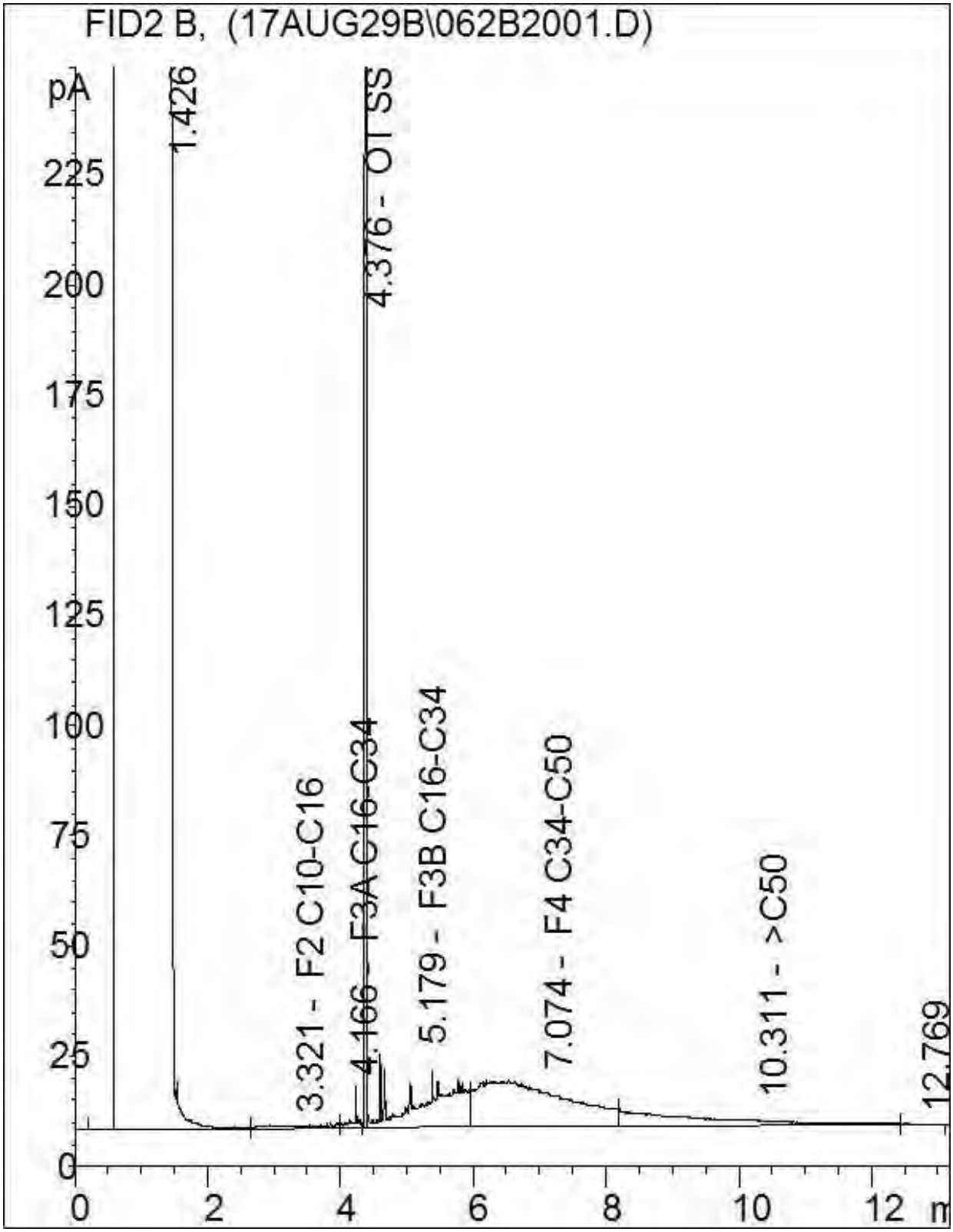


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7I5566
Report Date: 2017/09/01
Maxxam Sample: FAB692

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: SP203-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

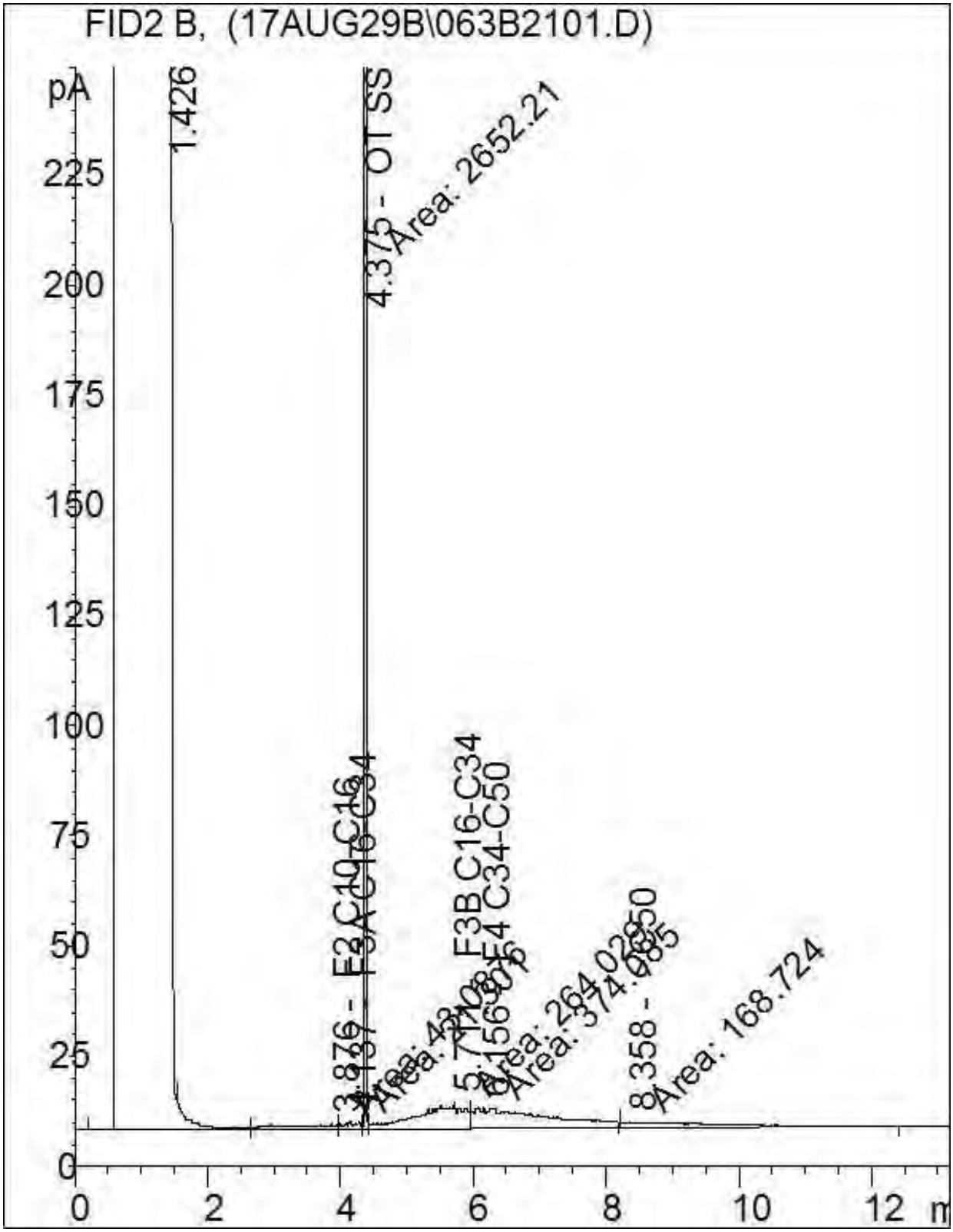


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7I5566
Report Date: 2017/09/01
Maxxam Sample: FAB693

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: DUP-7

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271-000
Your C.O.C. #: 611538-01-01, 611538-02-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/06/16
Report #: R4535532
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7A7887
Received: 2017/05/25, 16:30

Sample Matrix: Water
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Chloride by Automated Colourimetry (1)	2	N/A	2017/05/30	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry (1)	3	N/A	2017/06/12	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry (1)	5	N/A	2017/06/13	CAM SOP-00463	EPA 325.2 m
Free (WAD) Cyanide (1)	3	N/A	2017/05/30	CAM SOP-00457	OMOE E3015 m
Petroleum Hydro. CCME F1 & BTEX in Water (1)	10	N/A	2017/05/30	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	10	2017/05/30	2017/05/31	CAM SOP-00316	CCME PHC-CWS m
Dissolved Metals by ICPMS (1)	2	N/A	2017/05/31	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS (1)	8	N/A	2017/06/09	CAM SOP-00447	EPA 6020B m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

Your Project #: 450271-000
Your C.O.C. #: 611538-01-01, 611538-02-01

Attention:Alisha Williamson

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/06/16
Report #: R4535532
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7A7887
Received: 2017/05/25, 16:30

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

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

RESULTS OF ANALYSES OF WATER

Maxxam ID		ELH048		ELH049			ELH050	ELH051	ELH052		
Sampling Date		2017/05/24 12:40		2017/05/24 13:30			2017/05/23 14:20	2017/05/23 15:20	2017/05/24 11:30		
COC Number		611538-01-01		611538-01-01			611538-01-01	611538-01-01	611538-01-01		
	UNITS	**MW17-1**	**RDL**	**MW17-2**	**RDL**	**QC Batch**	**MW17-3**	**MW17-4**	**MW17-5**	**RDL**	**QC Batch**
Inorganics											
Dissolved Chloride (Cl)	mg/L	880	10	390	5.0	5022906	140	140	11	1.0	5022694

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		ELH053	ELH054			ELH055			ELH056		
Sampling Date		2017/05/24 10:30	2017/05/24 09:40			2017/05/23 13:15			2017/05/23 12:30		
COC Number		611538-01-01	611538-01-01			611538-01-01			611538-01-01		
	UNITS	**MW17-6**	**MW17-7**	**RDL**	**QC Batch**	**MW17-8**	**RDL**	**QC Batch**	**MW17-9**	**RDL**	**QC Batch**
Inorganics											
WAD Cyanide (Free)	ug/L	<1	<1	1	5005142		1	5005142		1	5005142
Dissolved Chloride (Cl)	mg/L	1.3	120	1.0	5022694	490	6.0	5022906	910	10	5004247

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		ELH057	ELH058		
Sampling Date		2017/05/23	2017/05/24		
COC Number		611538-01-01	611538-02-01		
	UNITS	**DUP-1**	**DUP-2**	**RDL**	**QC Batch**
Inorganics					
WAD Cyanide (Free)	ug/L		<1	1	5005142
Dissolved Chloride (Cl)	mg/L	900		10	5004247

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		ELH048	ELH049	ELH050	ELH051	ELH052	ELH053		
Sampling Date		2017/05/24 12:40	2017/05/24 13:30	2017/05/23 14:20	2017/05/23 15:20	2017/05/24 11:30	2017/05/24 10:30		
COC Number		611538-01-01	611538-01-01	611538-01-01	611538-01-01	611538-01-01	611538-01-01		
	UNITS	**MW17-1**	**MW17-2**	**MW17-3**	**MW17-4**	**MW17-5**	**MW17-6**	**RDL**	**QC Batch**
Metals									
Dissolved Uranium (U)	ug/L	47	13	13	13	9.6	4.7	0.10	5017003

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		ELH054	ELH055		
Sampling Date		2017/05/24 09:40	2017/05/23 13:15		
COC Number		611538-01-01	611538-01-01		
	UNITS	**MW17-7**	**MW17-8**	**RDL**	**QC Batch**
Metals					
Dissolved Uranium (U)	ug/L	3.1	8.2	0.10	5017003

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

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Client Project #: 450271-000
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O.REG 153 DISSOLVED ICPMS METALS (WATER)

Maxxam ID		ELH056	ELH057		
Sampling Date		2017/05/23 12:30	2017/05/23		
COC Number		611538-01-01	611538-01-01		
	UNITS	**MW17-9**	**DUP-1**	**RDL**	**QC Batch**
Metals					
Dissolved Uranium (U)	ug/L	23	23	0.10	5004924

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

O.REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		ELH048	ELH049	ELH050	ELH051	ELH052	ELH053		
Sampling Date		2017/05/24 12:40	2017/05/24 13:30	2017/05/23 14:20	2017/05/23 15:20	2017/05/24 11:30	2017/05/24 10:30		
COC Number		611538-01-01	611538-01-01	611538-01-01	611538-01-01	611538-01-01	611538-01-01		
	UNITS	**MW17-1**	**MW17-2**	**MW17-3**	**MW17-4**	**MW17-5**	**MW17-6**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons									
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	5004278
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	5004278
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	5004278
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	5004278
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	5004278
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	5004278
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	<25	25	5004278
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	<25	25	5004278
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	<100	100	5005090
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	99	101	102	101	102	100		5004278
4-Bromofluorobenzene	%	98	99	101	99	99	98		5004278
D10-Ethylbenzene	%	98	97	100	100	101	98		5004278
D4-1,2-Dichloroethane	%	96	97	98	97	98	98		5004278
o-Terphenyl	%	100	99	100	99	100	100		5005090

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

O.REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		ELH054	ELH055	ELH056	ELH057		
Sampling Date		2017/05/24 09:40	2017/05/23 13:15	2017/05/23 12:30	2017/05/23		
COC Number		611538-01-01	611538-01-01	611538-01-01	611538-01-01		
	UNITS	**MW17-7**	**MW17-8**	**MW17-9**	**DUP-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons							
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5004278
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5004278
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5004278
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	5004278
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	5004278
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	5004278
F1 (C6-C10)	ug/L	<25	<25	<25	<25	25	5004278
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	25	5004278
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	5005090
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	102	100	101	98		5004278
4-Bromofluorobenzene	%	101	100	99	100		5004278
D10-Ethylbenzene	%	99	101	98	96		5004278
D4-1,2-Dichloroethane	%	98	98	99	98		5004278
o-Terphenyl	%	100	99	100	100		5005090

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: ELH048
Sample ID: MW17-1
Matrix: Water

Collected: 2017/05/24
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022906	N/A	2017/06/12	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH049
Sample ID: MW17-2
Matrix: Water

Collected: 2017/05/24
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022906	N/A	2017/06/12	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH050
Sample ID: MW17-3
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022694	N/A	2017/06/13	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH051
Sample ID: MW17-4
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022694	N/A	2017/06/13	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH052
Sample ID: MW17-5
Matrix: Water

Collected: 2017/05/24
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022694	N/A	2017/06/13	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: ELH053
Sample ID: MW17-6
Matrix: Water

Collected: 2017/05/24
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022694	N/A	2017/06/13	Alina Dobreanu
Free (WAD) Cyanide	SKAL/CN	5005142	N/A	2017/05/30	Lantian Jin
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH054
Sample ID: MW17-7
Matrix: Water

Collected: 2017/05/24
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022694	N/A	2017/06/13	Alina Dobreanu
Free (WAD) Cyanide	SKAL/CN	5005142	N/A	2017/05/30	Lantian Jin
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH055
Sample ID: MW17-8
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5022906	N/A	2017/06/12	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5017003	N/A	2017/06/09	Thao Nguyen

Maxxam ID: ELH056
Sample ID: MW17-9
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5004247	N/A	2017/05/30	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5004924	N/A	2017/05/31	Thao Nguyen

Maxxam ID: ELH057
Sample ID: DUP-1
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5004247	N/A	2017/05/30	Alina Dobreanu
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5004278	N/A	2017/05/30	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5005090	2017/05/30	2017/05/31	Zhiyue (Frank) Zhu
Dissolved Metals by ICPMS	ICP/MS	5004924	N/A	2017/05/31	Thao Nguyen

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

TEST SUMMARY

Maxxam ID: ELH058
Sample ID: DUP-2
Matrix: Water

Collected: 2017/05/24
Shipped:
Received: 2017/05/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	SKAL/CN	5005142	N/A	2017/05/30	Lantian Jin

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

GENERAL COMMENTS

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

Package 1	2.7°C

Revised Report (2017/06/16): Chloride and Uranium analysis has been included in this report.

Sample ELH053 [MW17-6] : All containers, except for dissolved metals, were received with Trace Settled Sediment (just covers bottom of container or less).

Results relate only to the items tested.

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Maxxam Job #: B7A7887
Report Date: 2017/06/16

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5004278	1,4-Difluorobenzene	2017/05/30	101	70 - 130	101	70 - 130	103	%		
5004278	4-Bromofluorobenzene	2017/05/30	99	70 - 130	102	70 - 130	99	%		
5004278	D10-Ethylbenzene	2017/05/30	96	70 - 130	96	70 - 130	90	%		
5004278	D4-1,2-Dichloroethane	2017/05/30	96	70 - 130	100	70 - 130	108	%		
5005090	o-Terphenyl	2017/05/31	101	60 - 130	102	60 - 130	100	%		
5004247	Dissolved Chloride (Cl)	2017/05/30	NC	80 - 120	103	80 - 120	<1.0	mg/L	3.3	20
5004278	Benzene	2017/05/31	NC	70 - 130	85	70 - 130	<0.20	ug/L	3.6	30
5004278	Ethylbenzene	2017/05/31	98	70 - 130	83	70 - 130	<0.20	ug/L	3.5	30
5004278	F1 (C6-C10) - BTEX	2017/05/31					<25	ug/L	3.6	30
5004278	F1 (C6-C10)	2017/05/31	79	70 - 130	86	70 - 130	<25	ug/L	0.11	30
5004278	o-Xylene	2017/05/31	85	70 - 130	85	70 - 130	<0.20	ug/L	1.0	30
5004278	p+m-Xylene	2017/05/31	87	70 - 130	85	70 - 130	<0.40	ug/L	1.9	30
5004278	Toluene	2017/05/31	81	70 - 130	79	70 - 130	<0.20	ug/L	9.0	30
5004278	Total Xylenes	2017/05/31					<0.40	ug/L	1.7	30
5004924	Dissolved Uranium (U)	2017/05/31	102	80 - 120	100	80 - 120	<0.10	ug/L	6.2	20
5005090	F2 (C10-C16 Hydrocarbons)	2017/05/31	100	50 - 130	98	60 - 130	<100	ug/L	13	30
5005142	WAD Cyanide (Free)	2017/05/30	105	80 - 120	104	80 - 120	<1	ug/L	NC	20
5017003	Dissolved Uranium (U)	2017/06/09	105	80 - 120	103	80 - 120	<0.10	ug/L	5.4	20
5022694	Dissolved Chloride (Cl)	2017/06/13	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.0	20
5022906	Dissolved Chloride (Cl)	2017/06/12	NC	80 - 120	102	80 - 120	<1.0	mg/L	0.99	20

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

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

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

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

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

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

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7A7887
Report Date: 2017/06/16

ARCADIS Canada Inc
Client Project #: 450271-000
Sampler Initials: AW

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Specialist

Cristina Carriere, Scientific Services

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

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25-May-17 16:30

Alison Cameron

B7A7887

TSP ENV-943

Presence of Visible Particulate/Sediment

Maxxam Analytics
CAM FCD-01013/5

When there is >1cm of visible particulate/sediment, the amount will be recorded in the field below

		Bottle Types																														
		Inorganics						Organics										Hydrocarbons							Volatiles				Other				
	Sample ID	All	CrVI	CN	General	Hg	Metals (Diss.)	Organic 1 of 2	Organic 2 of 2	PCB 1 of 2	PCB 2 of 2	Pest/ Herb 1 of 2	Pest/ Herb 2 of 2	SVOC/ ABN 1 of 2	SVOC/ ABN 2 of 2	PAH 1 of 2	PAH 2 of 2	Dioxin /Furan	F1 Vial 1	F1 Vial 2	F1 Vial 3	F1 Vial 4	F2-F4 1 of 2	F2-F4 2 of 2	F4G	VOC Vial 1	VOC Vial 2	VOC Vial 3	VOC Vial 4					
1	MW15-6	TS												-																		
2						-																										
3								-																								
4																																
5		-						-																								
6																																
7																																
8					-																			?								
9																																
10																																

Comments: Ekleht 1/1 SM.

Legend:	
P	Suspended Particulate
TS	Trace Settled Sediment (just covers bottom of container or less)
S	Sediment greater than (>) Trace, but less than (<) 1 cm

Recorded By: (signature/print) Tara-Lyn

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

CHAIN OF CUSTODY RECORD

Page 1 of 2

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B54416	Maxxam Job #:	Bottle Order #: 611538
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Project Name:		C#611538-01-01	Alison Cameron
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	AW ICD		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☑ Res/Park ☐ Medium/Fine ☐ Table 2 ☑ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☑ For RSC ☑ Table 6	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? _____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Petroleum Hydrocarbons (Water)	Chloride by Automated Colourimetry	O.Reg 153 Dissolved ICPMS Metals (Water)	Free (WAD) Cyanide	# of Bottles	Comments
1		MW17-1	May 24 2017	12:40	GW	Y	✓	✓	✓		6	Please put Chloride and Diss. metals on hold until 17-9 results are provided.
2		MW17-2	May 24 2017	1:30	GW	Y	✓	✓	✓		6	"
3		MW17-3	May 23 2017	2:20	GW	Y	✓	✓	✓		6	"
4		MW17-4	May 23 2017	3:20	GW	Y	✓	✓	✓		6	"
5		MW17-5	May 24 2017	11:30	GW	Y	✓	✓	✓		6	"
6		MW17-6	May 24 2017	10:30	GW	Y	✓	✓	✓	✓	7	"
7		MW17-7	May 24 2017	9:40	GW	Y	✓	✓	✓	✓	7	"
8		MW17-8	May 23 2017	1:15	GW	Y	✓	✓	✓		6	"
9		MW17-9	May 23 2017	12:30	GW	Y	✓	✓	✓		6	Sample all.
10		DUP-1	May 23 2017	—	GW	Y	✓	✓	✓		6	Sample all ON ICE

25-May-17 16:30
Alison Cameron
B7A7887
TSP ENV-943

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Confirmation Number: _____ (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alisha Williamson	17/05/25	05:00	[illegible] Jcampeau BV	2017/05/25	16:30	
Alisha Williamson			Jcampeau BV	2017/05/25	22:45	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	3, 3, 2	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

7/8/9 9/9/10

Maxxam Analytics International Corporation o/a Maxxam Analytics

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:		Quotation #:	B54416	Maxxam Job #:	Bottle Order #:
Attention:	Invoices Attention	Attention:	Alisha Williamson	P.O. #:			611538
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271-000	COC #:	Project Manager:
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Project Name:		C#611538-02-01	Alison Cameron
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	alisha.williamson@arcadis-canada.com	Site #:			
				Sampled By:	AW / CD		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)

- ☐ Table 1 ☑ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☑ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☑ For RSC
- ☑ Table 6

Other Regulations

- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality
- ☐ PWQO
- ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Petroleum Hydrocarbons (Water)	Chloride by Automated Colourimetry	O.Reg 153 Dissolved ICPMS Metals (Water)	Free (WAD) Cyanide	# of Bottles	Comments
1		DUP-2	May 24 2017	—	GW	N				✓	1	
2												
3												
4												
5												
6												
7												
8												
9												
10												ON Ice

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alisha Williamson	17/05/25	08:00	[illegible]	17-05-30	16:20	
Alisha Williamson		-	[illegible]	2017/05/25		

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	3, 4, 2	Present	✓	
		Intact	✓	

2017/05/25 22:45

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

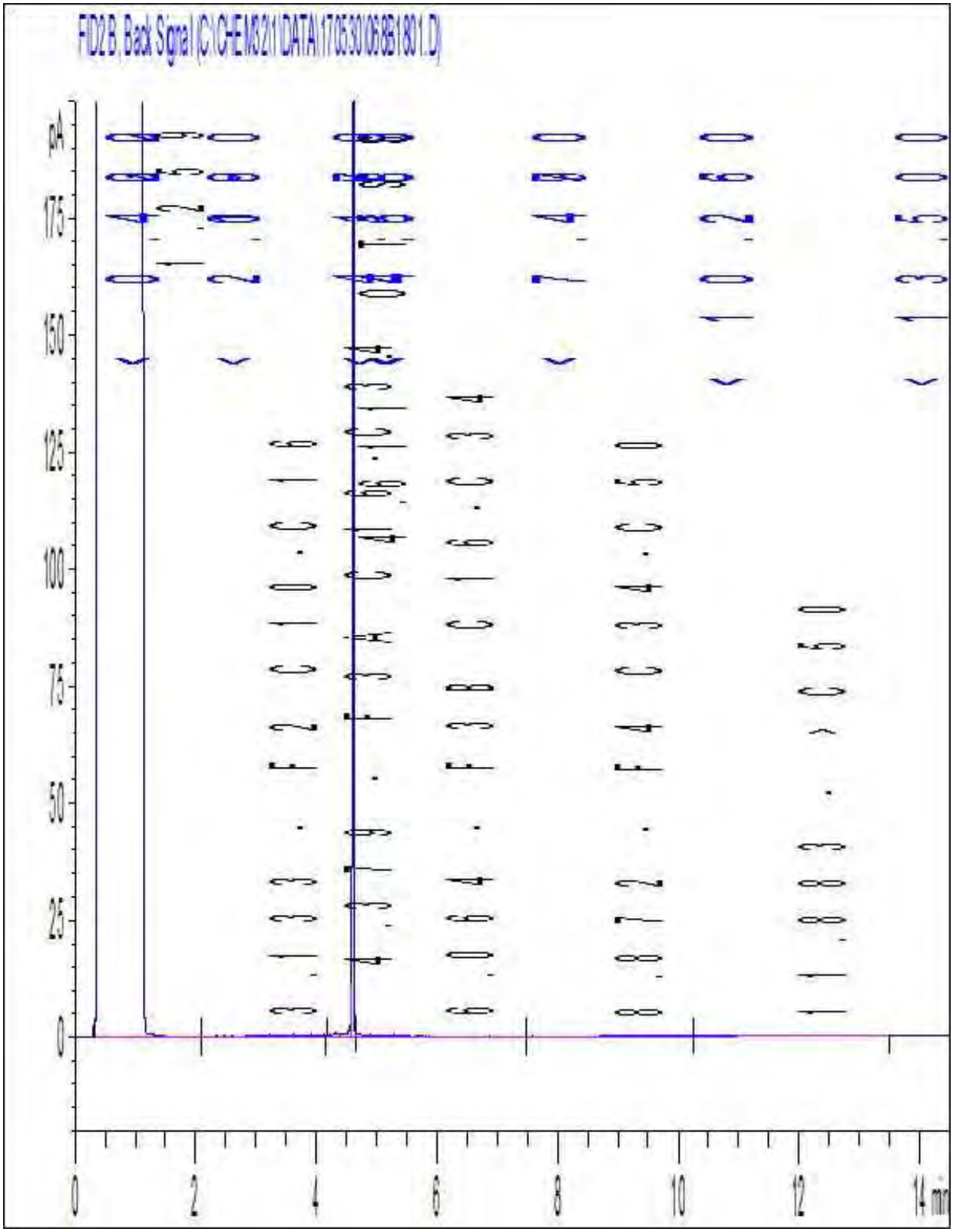
White: Maxxa Yellow: Client

7/8/9/9/10

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH048

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

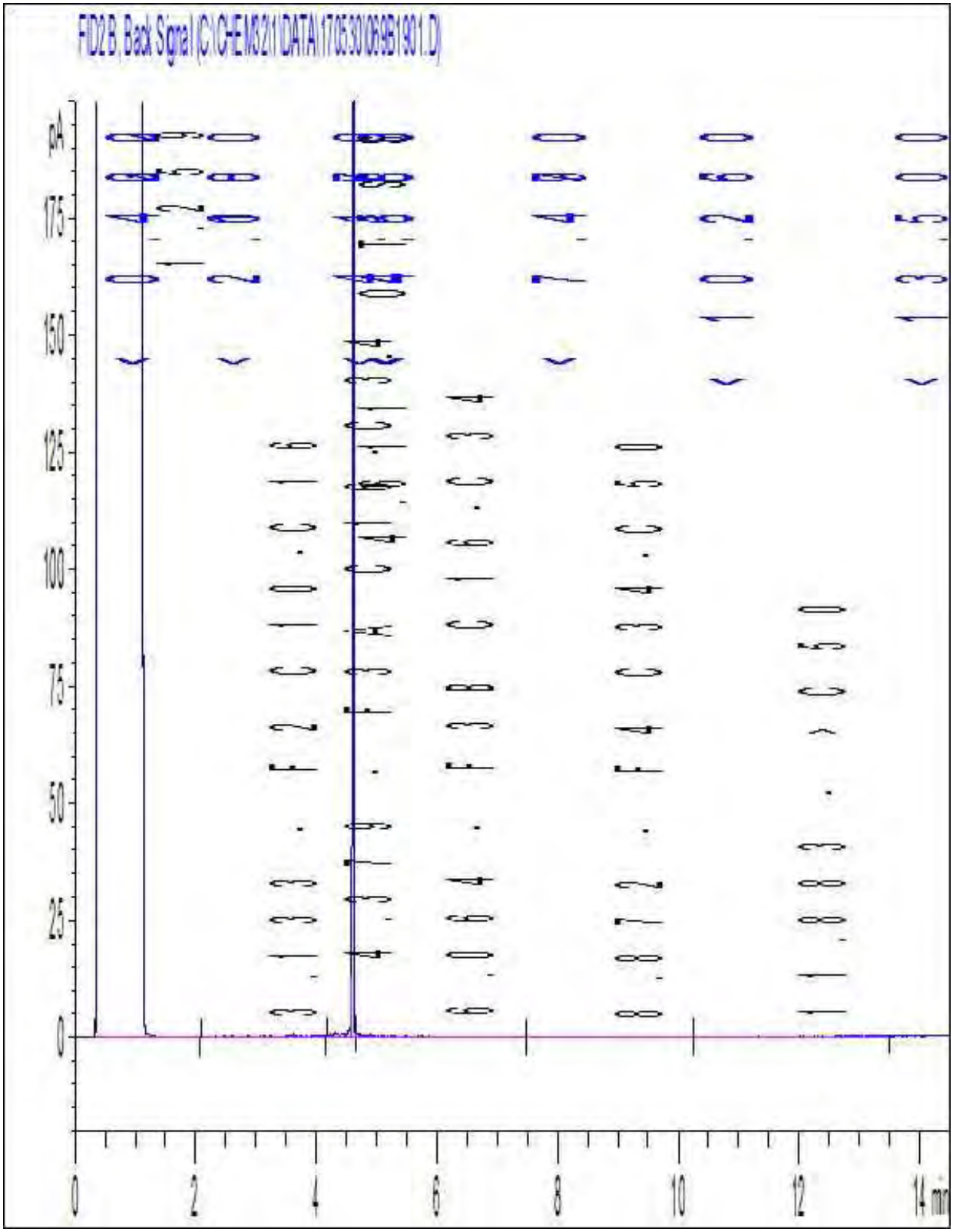


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH049

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-2

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

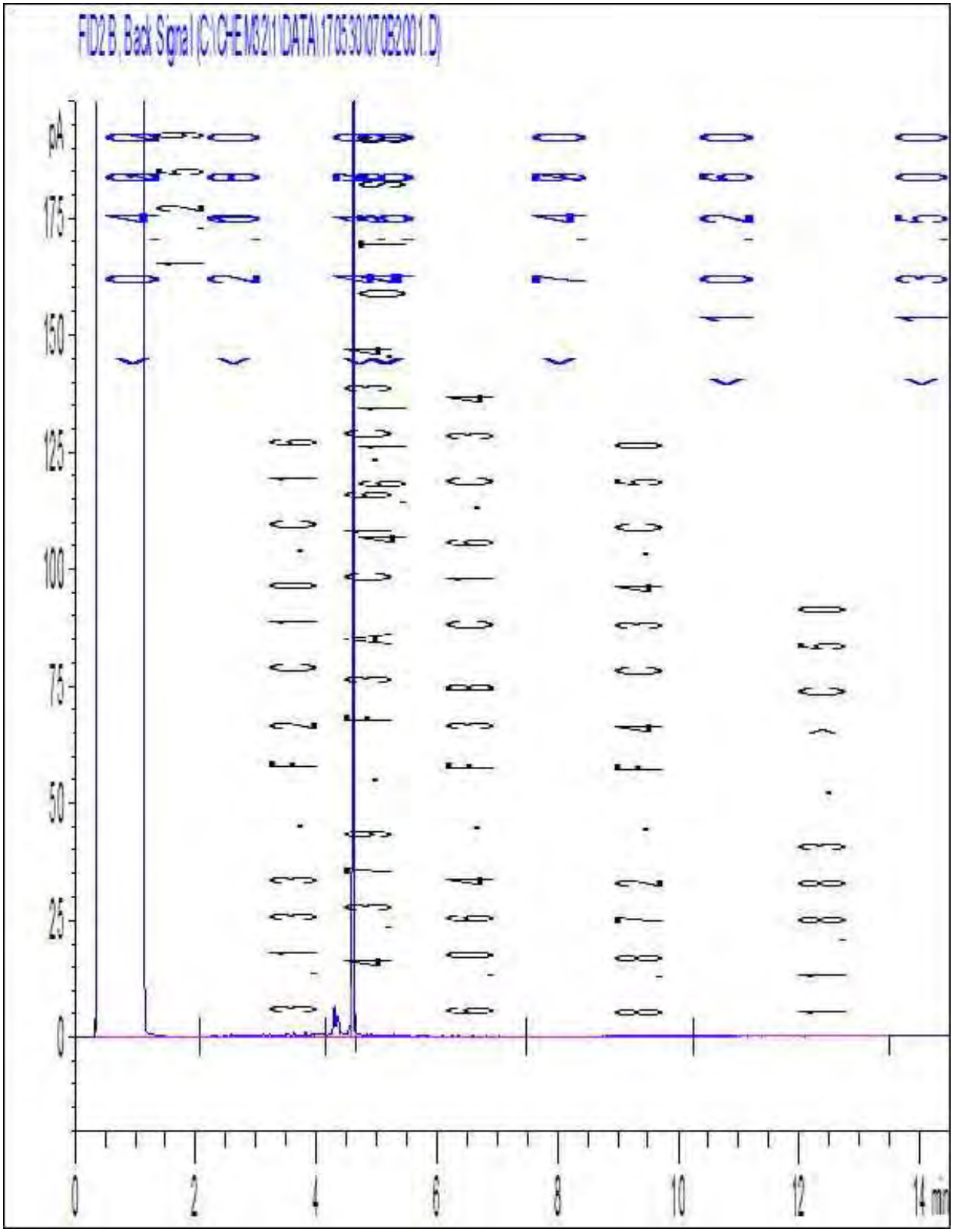


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH050

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-3

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

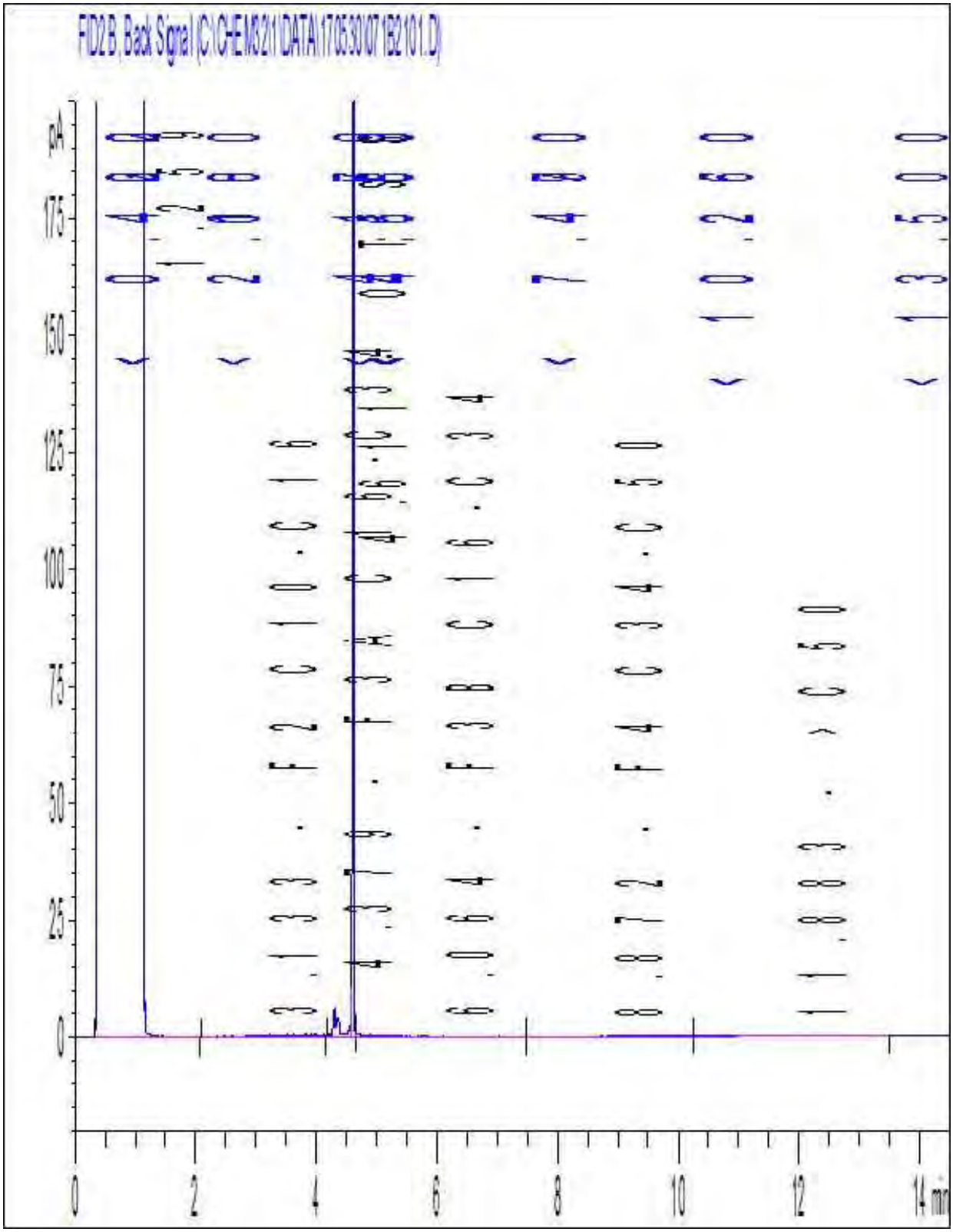


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH051

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-4

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

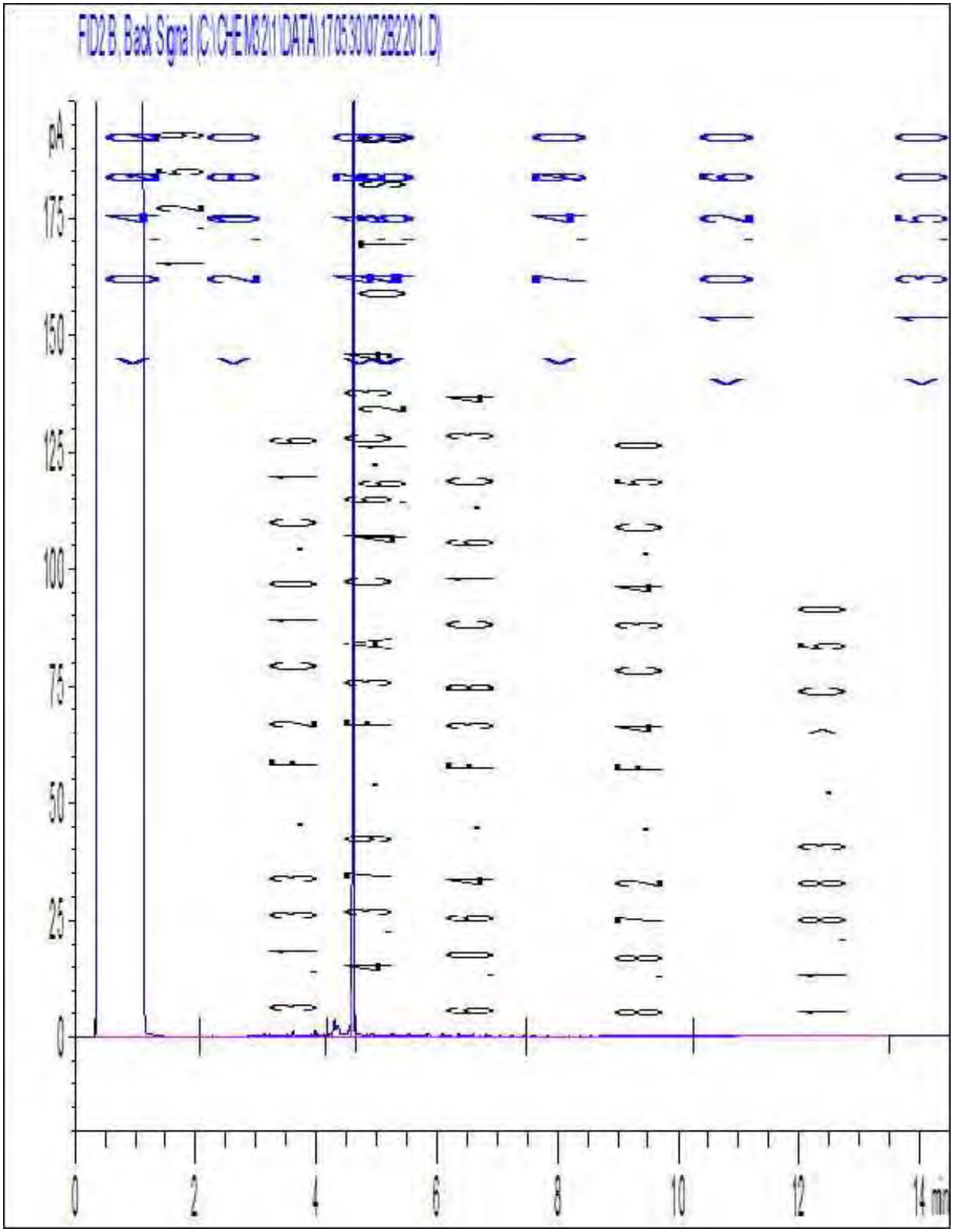


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH052

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-5

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

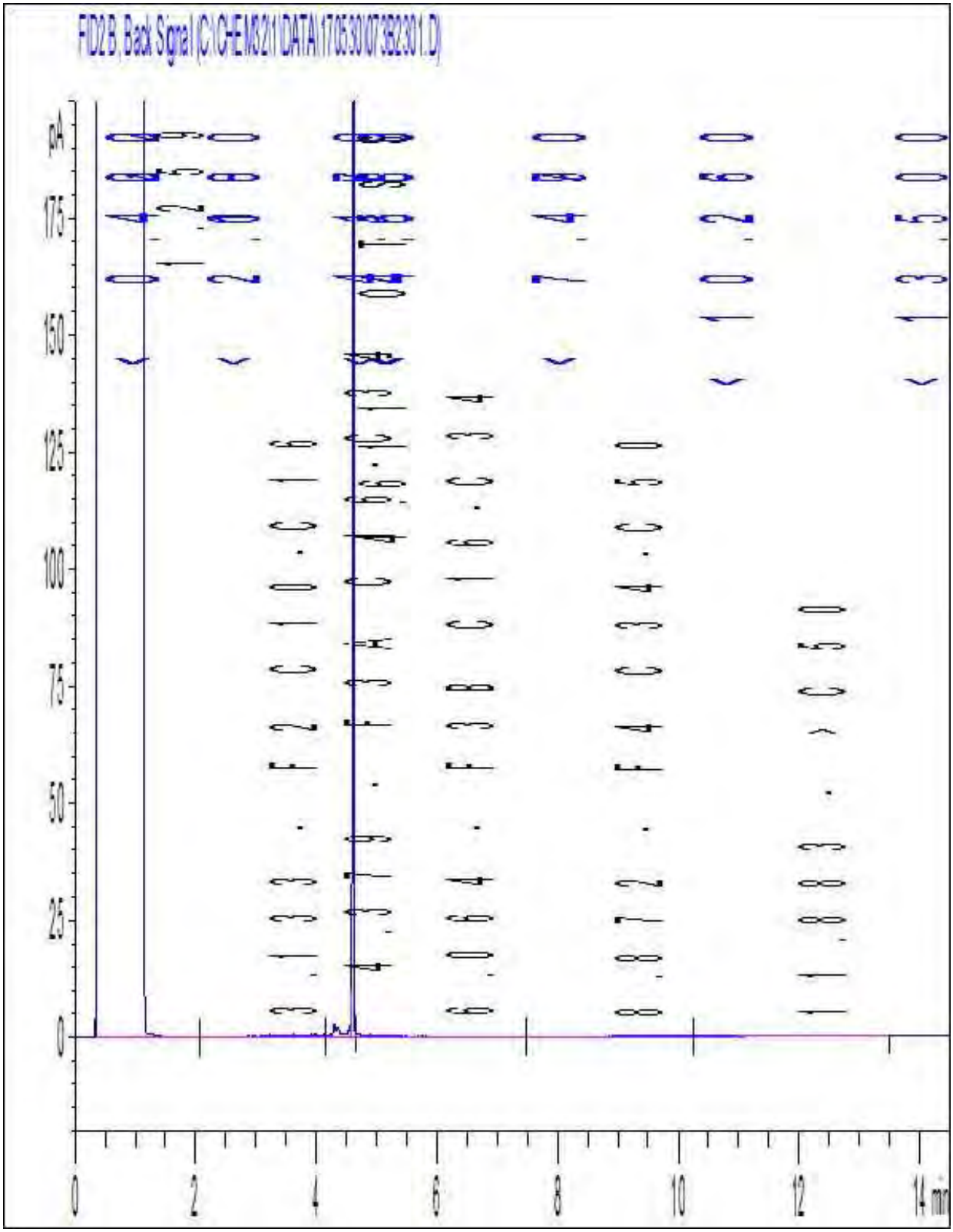


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH053

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-6

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

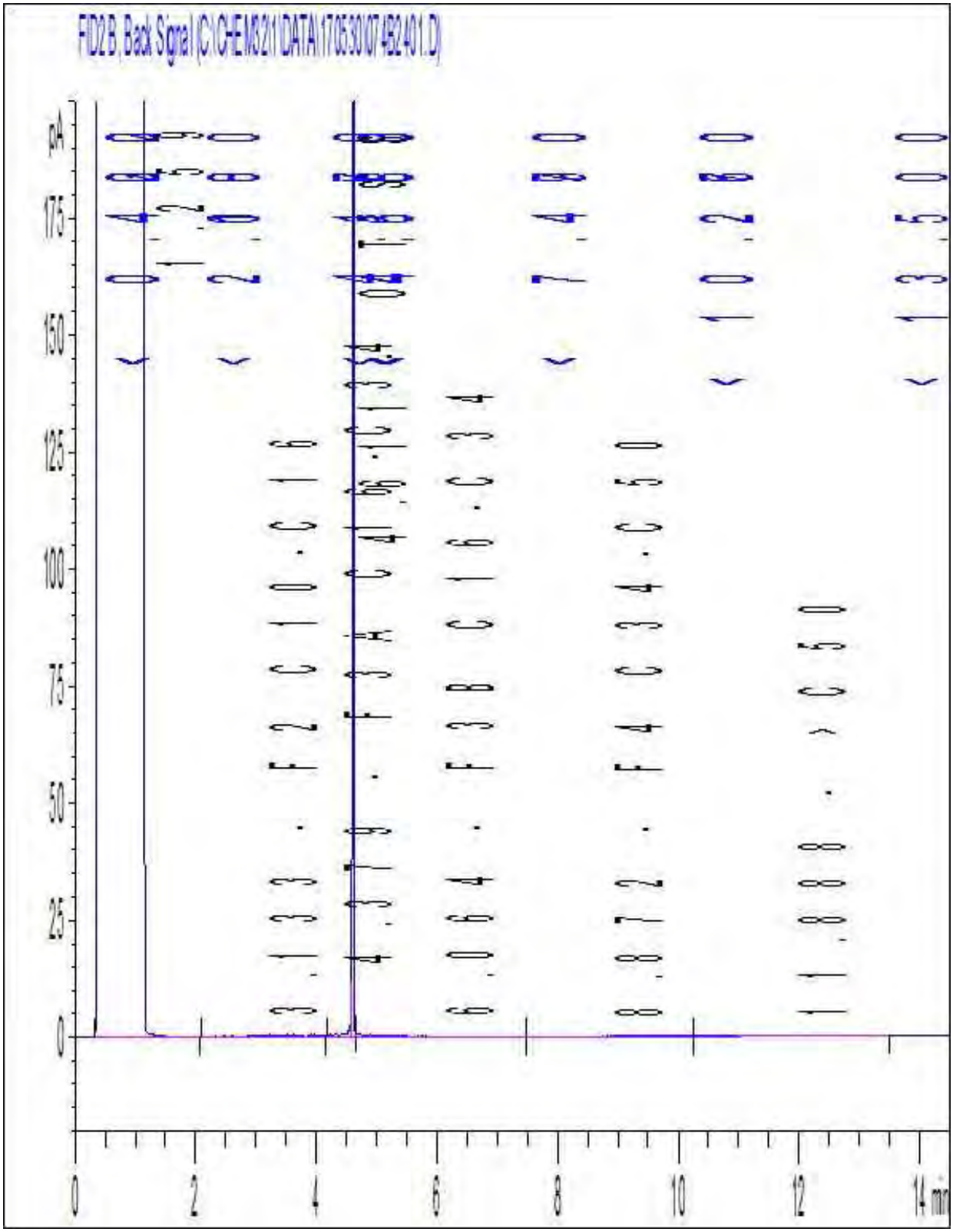


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH054

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-7

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

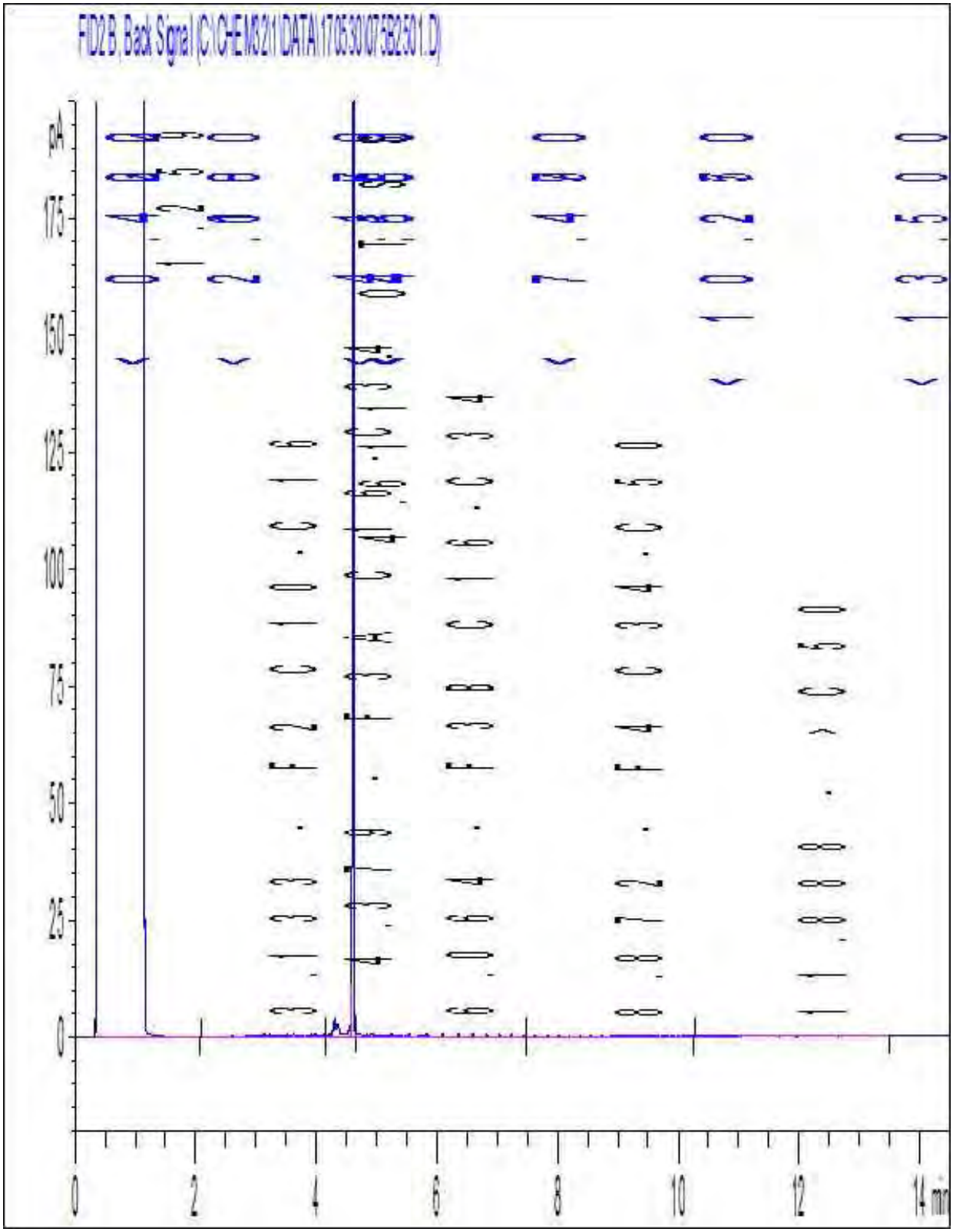


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH055

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-8

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

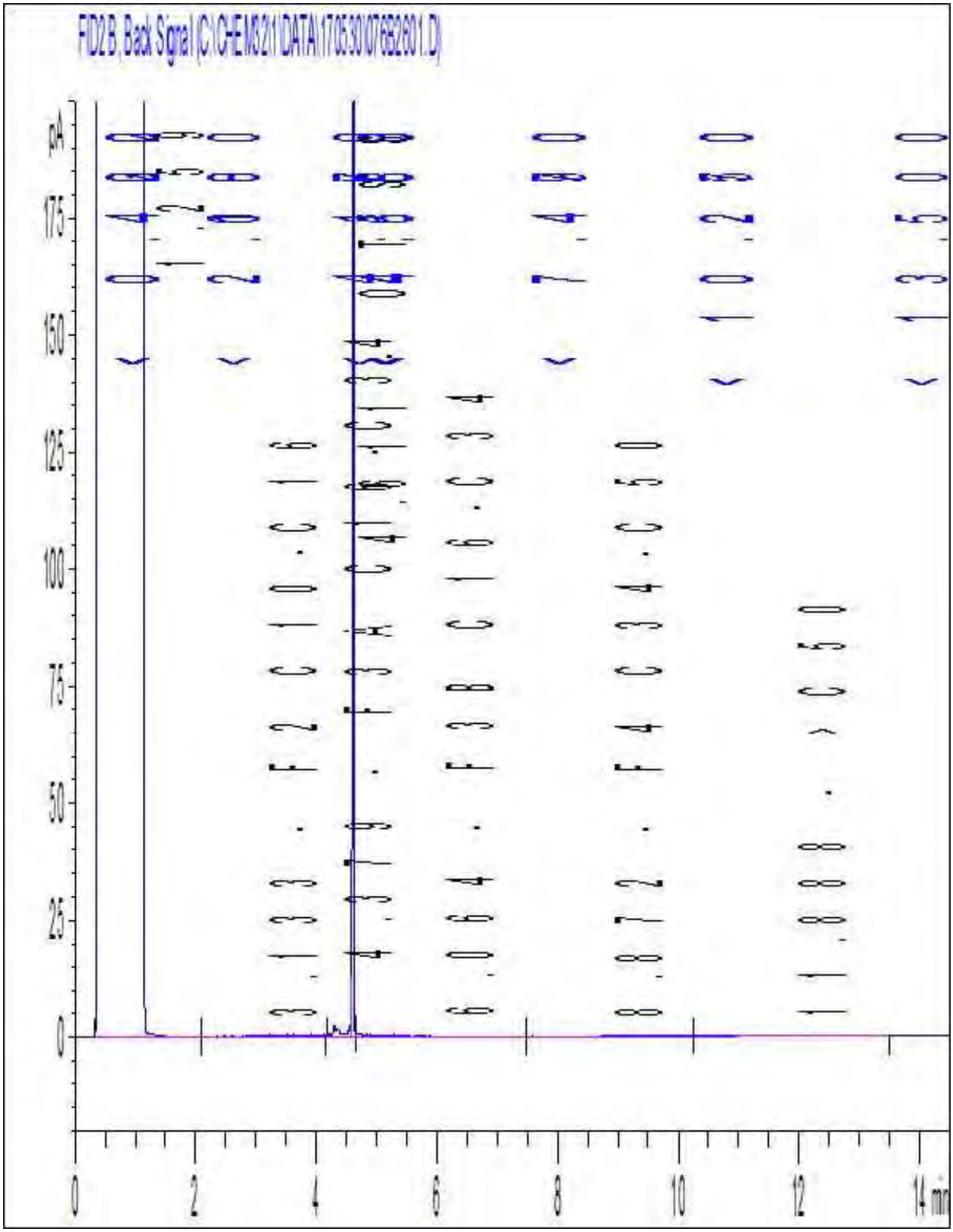


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH056

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: MW17-9

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

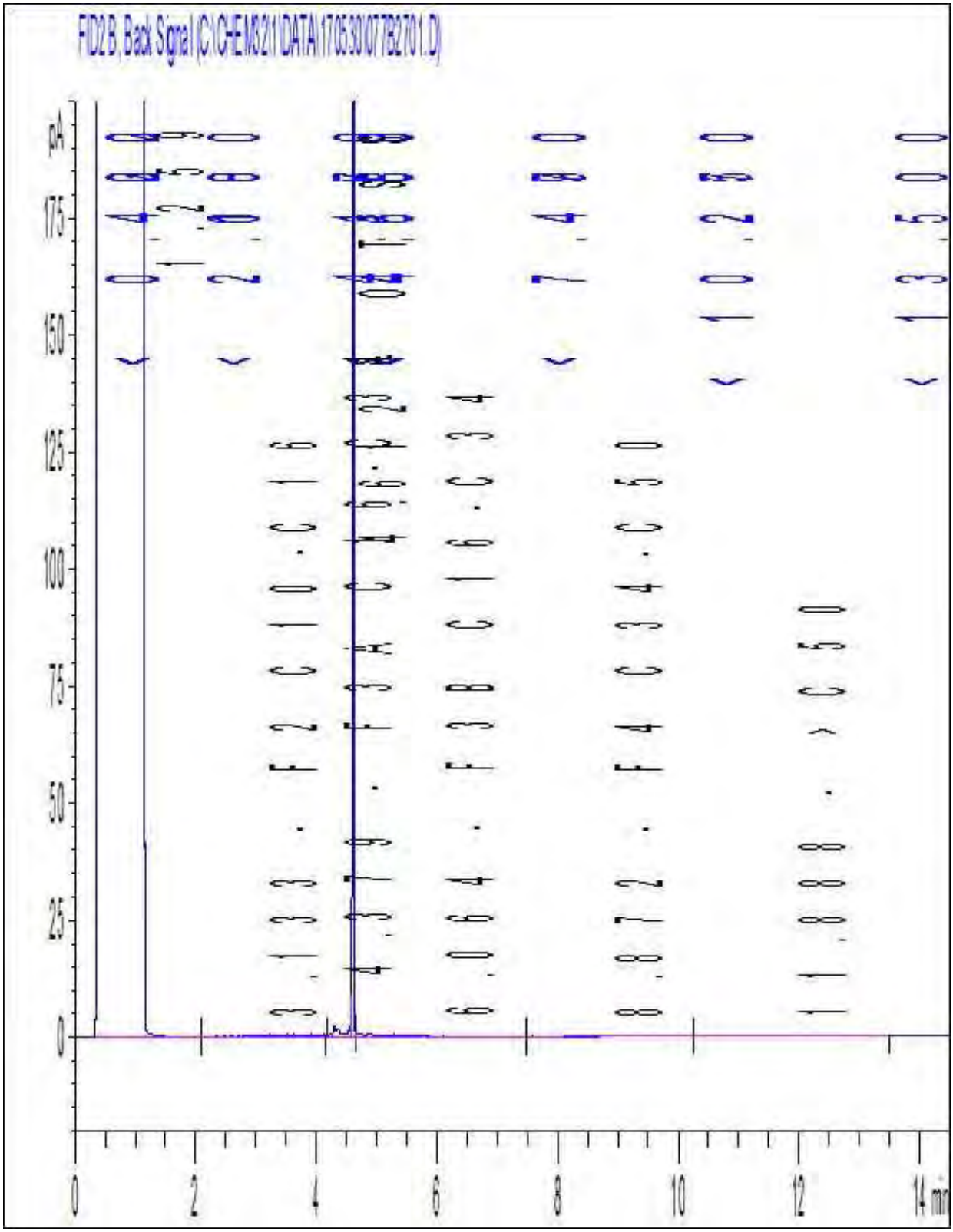


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7A7887
Report Date: 2017/06/16
Maxxam Sample: ELH057

ARCADIS Canada Inc
Client Project #: 450271-000
Client ID: DUP-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



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

Your Project #: 450271
Site Location: 1830 TRIM RD
Your C.O.C. #: 636352-01-01

Attention:Troy Austrins

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/11/08
Report #: R4836958
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7O3909
Received: 2017/11/01, 13:35

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Glycols in Water by GC/FID (1)	3	N/A	2017/11/06	CAM SOP-00322	based on EPA 8015

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Jonathan Urben, Senior Project Manager
Email: jurben@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B7O3909
Report Date: 2017/11/08

ARCADIS Canada Inc
Client Project #: 450271
Site Location: 1830 TRIM RD
Sampler Initials: LG

GLYCOLS BY GC-FID (WATER)

Maxxam ID		FLN719	FLN719	FLN720	FLN721		
Sampling Date		2017/11/01 12:00	2017/11/01 12:00	2017/11/01 12:30	2017/11/01		
COC Number		636352-01-01	636352-01-01	636352-01-01	636352-01-01		
	UNITS	**MW 16-4-G**	**MW 16-4-G Lab-Dup**	**MW 17-2-G**	**DUP-G**	**RDL**	**QC Batch**
Glycols							
Propylene Glycol	mg/L	<5	<5	<5	<5	5	5251557
Ethylene Glycol	mg/L	<5	<5	<5	<5	5	5251557
Diethylene Glycol	mg/L	<5	<5	<5	<5	5	5251557
Total Glycol	mg/L	<5	<5	<5	<5	5	5251557

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7O3909
Report Date: 2017/11/08

ARCADIS Canada Inc
Client Project #: 450271
Site Location: 1830 TRIM RD
Sampler Initials: LG

TEST SUMMARY

Maxxam ID: FLN719
Sample ID: MW 16-4-G
Matrix: Water

Collected: 2017/11/01
Shipped:
Received: 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Glycols in Water by GC/FID	GC/FID	5251557	N/A	2017/11/06	Zhiyue (Frank) Zhu

Maxxam ID: FLN719 Dup
Sample ID: MW 16-4-G
Matrix: Water

Collected: 2017/11/01
Shipped:
Received: 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Glycols in Water by GC/FID	GC/FID	5251557	N/A	2017/11/06	Zhiyue (Frank) Zhu

Maxxam ID: FLN720
Sample ID: MW 17-2-G
Matrix: Water

Collected: 2017/11/01
Shipped:
Received: 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Glycols in Water by GC/FID	GC/FID	5251557	N/A	2017/11/06	Zhiyue (Frank) Zhu

Maxxam ID: FLN721
Sample ID: DUP-G
Matrix: Water

Collected: 2017/11/01
Shipped:
Received: 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Glycols in Water by GC/FID	GC/FID	5251557	N/A	2017/11/06	Zhiyue (Frank) Zhu

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7O3909
Report Date: 2017/11/08

ARCADIS Canada Inc
Client Project #: 450271
Site Location: 1830 TRIM RD
Sampler Initials: LG

GENERAL COMMENTS

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

Package 1	7.7°C

Cooler custody seal was present and intact.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7O3909
Report Date: 2017/11/08

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271
Site Location: 1830 TRIM RD
Sampler Initials: LG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5251557	Diethylene Glycol	2017/11/06	80	60 - 140	91	60 - 140	<5	mg/L	NC	40
5251557	Ethylene Glycol	2017/11/06	99	60 - 140	97	60 - 140	<5	mg/L	NC	40
5251557	Propylene Glycol	2017/11/06	98	60 - 140	98	60 - 140	<5	mg/L	NC	40
5251557	Total Glycol	2017/11/06					<5	mg/L	NC	40

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

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

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

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

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

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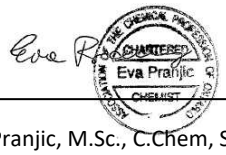
Maxxam Job #: B7O3909
Report Date: 2017/11/08

ARCADIS Canada Inc
Client Project #: 450271
Site Location: 1830 TRIM RD
Sampler Initials: LG

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

01-Nov-17 13:35

Jonathan Urben

B703909

KJY OTT-001

Presence of Visible Particulate/Sediment

CAM FCD 01013/4

When there is >1cm of visible particulate/sediment, the amount will be recorded in the field below

Sample ID	All	Bottle Types: Inorganics					Organics										Hydrocarbons							Volatiles				Other
		CrVI	CN	General	Hg	Metals (Diss.)	Organic 1 of 2	Organic 2 of 2	PCB 1 of 2	PCB 2 of 2	Pest/ Herb 1 of 2	Pest/ Herb 2 of 2	SVOC/ ABN 1 of 2	SVOC/ ABN 2 of 2	PAH 1 of 2	PAH 2 of 2	Dioxin /Furan	F1 Vial 1	F1 Vial 2	F1 Vial 3	F1 Vial 4	F2-F4 1 of 2	F2-F4 2 of 2	F4G	VOC Vial 1	VOC Vial 2	VOC Vial 3	VOC Vial 4	
MW 16-4-G																	TS	TS										
MW-17-2-G																	TS	TS										
Dup-G																	TS											

Comments:

Legend:	
P	Suspended Particulate
TP	Trace-Settled Particulate (just covers bottom of container or less)
TS	Trace Settled Sediment (just covers bottom of container or less)
S	Sediment greater than (>) Trace, but less than (<) 1 cm

Recorded By (signature/print): Kumi Jayamaha

Maxxam
A Bureau Veritas Group Company

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 ARCADIS Canada Inc	Company Name:	See Invoice	Quotation #:	B54416	Maxxam Job #:	Bottle Order #: 636352
Attention:	Invoices Attention	Attention:	Troy Austrins	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project:	450271		
				Project Name:	1830 Trim Rd.	COC #:	Project Manager:
Tel:	(613) 721-0555 x Fax: (613) 721-0029 x	Tel:	Fax:	Site #:		C#636352-01-01	Jonathan Urben
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis-c	Email:	troy.austrins@arcadis.com	Sampled By:	Jennat de Groot		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☒ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (If applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Glycols in Water by GC/FID	# of Bottles	Comments
1	MW16-4-G		1-11-17	12:00	GW	X	2	
2	MW17-2-G		"	12:30	GW	X	2	
3	Dup-G		"		GW	X	1 BA	
4								
5								
6								
7								
8								
9								
10								ON Ice

01-Nov-17 13:35
Jonathan Urben
B7O3909
KIY OTT-001
RECEIVED IN OTTAWA

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jennat de Groot	17-11-01	13:30	[illegible]	2017/11/01	13:35	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	8, 8, 7	Present		
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

APPENDIX F

MECP Well Records

(On-site Decommissioned Well-Sept. 2016 + Neighboring Properties)

31 G/6 S

UTM 18 Z 464411 E
15 R 5013516 15 N
Elev. 15 R 02185
Basin 215

1512776

56 No. 533

The Ontario Water Resources Commission Act, 1957

WATER WELL RECORD

County or District Russell Township, Village, Town or City CUMBERLAND

[redacted] Date completed March 30 (day) month 61 (year)

Address 27 Writh St Ottawa

Casing and Screen Record

Inside diameter of casing 2"
Total length of casing 94'
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole ~~2"~~ 2"

Pumping Test

Static level 18'
Test-pumping rate 7 G.P.M.
Pumping level 25'
Duration of test pumping 2 Hrs
Water clear or cloudy at end of test Clear
Recommended pumping rate 7 G.P.M.
with pumping level of Pump Set 25'

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
Blue Clay	0'	90'			
Gravel	90'	94'	94'	76'	Fresh

Water Record

For what purpose(s) is the water to be used?
Domestic

Is well on upland, in valley, or on hillside? Up

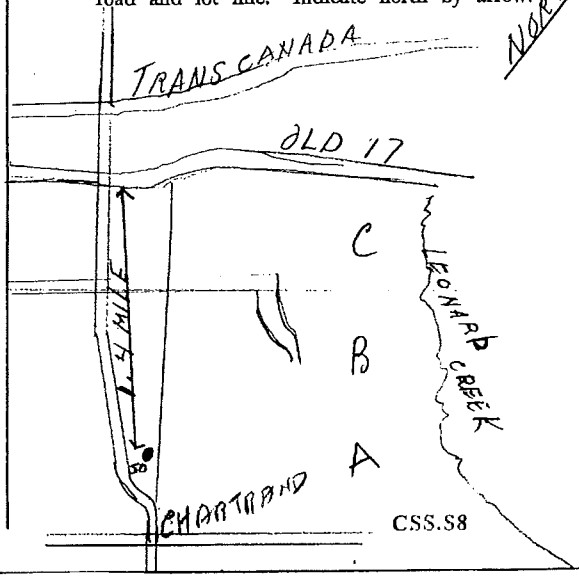
Drilling Firm
Address

Licence Number
Name of Driller Gerard Charbonneau
Orleans Ont
Address

Date March 30/61
Gerard Charbonneau
(Signature of Licensed Drilling Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 5
15M-58-4149

CSS.S8

The Ontario Water Resources Commission Act

WATER WELL RECORD

1461
3166

Water management in Ontario 1. PRINT ONLY IN SPACES PROVIDED 2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1512510 | MUNICIP. 1501V | CON. GON

COUNTY OR DISTRICT: Russell CARLETON | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Cumberland | CON., BLOCK, TRACT, SURVEY, ETC.: 9 | LOT: 24

OWNER (SURNAME FIRST) [redacted] | ADDRESS: R#1 Cumberland | DATE COMPLETED: DAY 02 MO 08

[redacted] | TWP | RC. | ELEVATION: 0280 | RC. | BASIN CODE: 25

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	TO
Blue	clay		packed	0	90
grey	sand	clay	soft	90	98
grey	hardpan		hard	98	103
black	gravel			103	106

31 | 0090 | 30 | 0098 | 28 | 30 | 0106 | 14 | 0106 | 11

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0106	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	TO
07	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0106
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER | PUMPING RATE: 0030 GPM | DURATION OF PUMPING: 01 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING PUMPING ☒ RECOVERY ☐	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
018 FEET	035 FEET		035 FEET	035 FEET	035 FEET	035 FEET

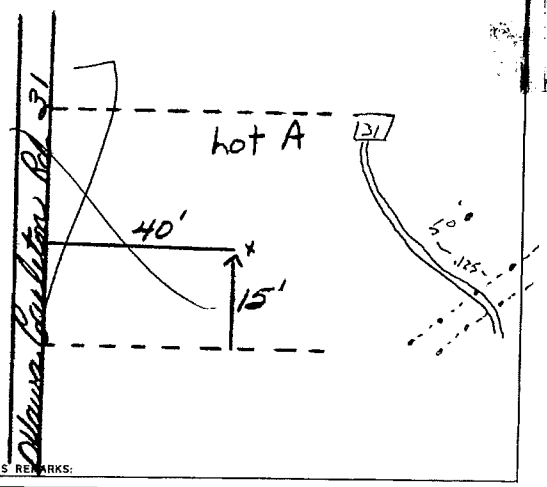
IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP | RECOMMENDED PUMP SETTING: 030 FEET | RECOMMENDED PUMPING RATE: 0005 GPM

001.8 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 54: 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 55-56 01: 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED

METHOD OF DRILLING 57: 1 ☒ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: [redacted] Capital Water Supply Ltd | LICENCE NUMBER: 1558

ADDRESS: Box 490 Alfonville, Ont.

NAME OF DRILLER OR BORER: Jim Moore | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Walter Cavanagh | SUBMISSION DATE: DAY 2 MO 8 YR 72

OWRC COPY

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1558 | DATE RECEIVED 63-68: 041072

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.S8 | P K | WI

UTM 18 | 463760 E
9 | 5035720 N
Elev. 9 | 0283
Basin 25 | 11 | 1 | B

31G/6 a

ONTARIO

1512777

GROUND WATER BRANCH
56 No. 534
OCT 6 1958
ONTARIO WATER RESOURCES COMMISSION

The Water-well Drillers Act, 1954
Department of Mines

Water-Well Record

[redacted] ship, Village, Town or City CUMBERLAND
in Village, Town or City)
Address

Date completed 11 (day) SEP (month) 58 (year)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	2"	Static level	12
Length(s)	101'	Pumping rate	500 GPH
Type of screen	NO	Pumping level	16
Length of screen		Duration of test	1 HR

Well Log — **Water Record**

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
BLUE CLAY	0	100			
LIMESTONE	100	107	106	95	FRESH

For what purpose(s) is the water to be used?
HOUSE
Is water clear or cloudy? CLEAR
Is well on upland, in valley, or on hillside?

Drilling firm
Address

Name of Driller G CHARBONNEAU
Address ORLEANS

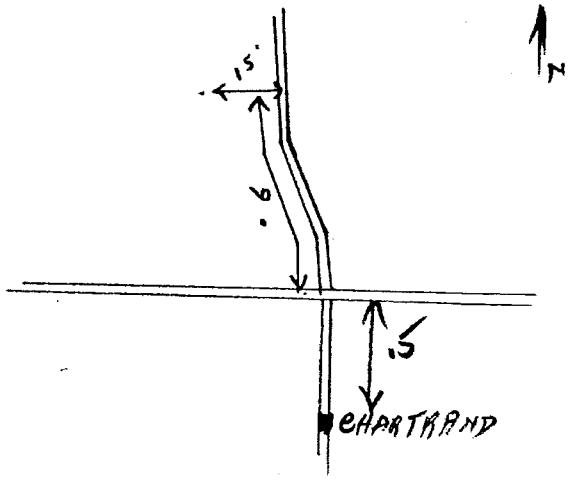
Licence Number

I certify that the foregoing statements of fact are true.

Date SEP 27 Gerard Charbonneau
Signature of Licensee

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 5

CSS.S8

Ontario Ministry of the Environment

Well Tag Number: A 014571 (A014571)

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | 1 | 6 | 1 | 1 | CON | 4 | N | | | | | 09 | LOT | 5 | 1 |

Well Owner's Information and Location of Well Information

[redacted]

Ottawa Carleton | Cumberland | 1 | 9

RR#/Street Number/Name: 1970 Trim Rd | City/Town/Village: Orleans | Site/Compartment/Block/Tract etc.

GPS Reading | NAD: 83 | Zone: 18 | Easting: 464357 | Northing: 5035991 | Unit Make/Model: Magellan | Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
	Clay			0	30.5
	gravel			30.5	31.1

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)
0	31.1	15.55

Water Record

Water found at ___ Metres	Kind of Water
31.1	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: NOT TESTED
___ m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
___ m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was: ☑ Clear and sediment free ☐ Other, specify NOT TESTED

Chlorinated: ☑ Yes ☐ No

Construction Record

Inside diam (centimetres)	Material	Wall thickness (centimetres)	Depth From	Depth To (Metres)
Casing				
15.88	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	0	30.8
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☑ Open hole		30.2	31.1

Test of Well Yield

Pumping test method: Submersible pump

	Draw Down Time (min)	Draw Down Water Level (Metres)	Recovery Time (min)	Recovery Water Level (Metres)
Pump intake set at - (metres)	Static Level	7.73		7.94
Pumping rate - (litres/min) 91	1	7.93	1	7.70
Duration of pumping 1 hrs + — min	2	7.94	2	7.70
Final water level end of pumping 7.9 metres	3		3	
Recommended pump type: ☐ Shallow ☑ Deep	4		4	
Recommended pump depth 29.4 metres	5		5	
Recommended pump rate 91 (litres/min)	10		10	
If flowing give rate - (litres/min) —	15		15	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60	7.94	60	7.70

Plugging and Sealing Record ☑ Annular space ☐ Abandonment

Depth set at - From	Depth set at - To (Metres)	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
30.2	0	bentonite slurry	0.7945

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☑ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☑ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: A. Rod Drilling Co Ltd | Well Contractor's Licence No.: 1119

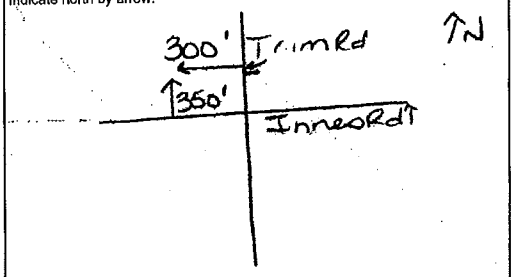
Business Address (street name, number, city etc.): RR#1 Richmond, Ont

Name of Well Technician (last name, first name): Purcell Shannon | Well Technician's Licence No.: 12122

Signature of Technician/Contractor: X [signature] | Date Submitted: 2004 06 28

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No. Z 14538 | Date Well Completed: 2004 06 18

Was the well owner's information package delivered? ☑ Yes ☐ No | Date Delivered: 2004 06 18

Ministry Use Only

Data Source | Contractor: 1119

Date Received: JUL 08 2004 | Date of Inspection

Remarks | Well Record Number: 1534760

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☑

Cette formule est disponible en français

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1515855 | MUNICIP. 1501 | CON. CON | 09

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Cumberland	9	BA

[redacted]
R. 1, Navan, Ont.

DATE COMPLETED: DAY 25 MO 08 YR 76

UTM/TWP | RC | ELEVATION | FD | SWL CODE
035500 | 4 | 0285 | 4 | 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
yellow	clay			0	18
blue	clay			18	98
grey	gravel			98	105
grey	limestone			105	110

OWRC 2-9

31 | 0018505 | 0098305 | 0105211 | 01/02/15
32

41 WATER RECORD

WATER FOUND AT FEET	KIND OF WATER
0110	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. - INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 5/8 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0106
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

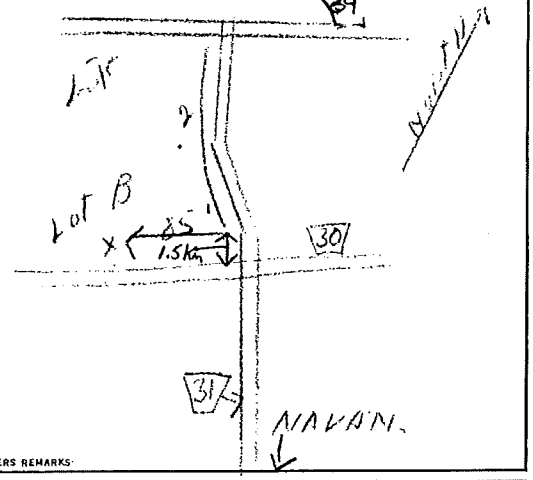
PUMPING TEST METHOD: ☒ PUMP air ☐ BAILER
PUMPING RATE: 0040 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☒ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
015 FEET	030 FEET		020 FEET	015 FEET	015 FEET	015 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 30 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 030 FEET
RECOMMENDED PUMPING RATE: 0010 GPM
GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 1
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01
1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING 4
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☒ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: G. Charbonneau Son Drilling Ltd | LICENCE NUMBER: 1504
ADDRESS: R R. 2, Box 194, Orleans, Ont. K1C 1T1
NAME OF DRILLER OR BORER: L. Bourgeois | LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: G. Clarke | SUBMISSION DATE: DAY 25 MO. 8 YR. 76

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1504 | DATE RECEIVED: 18 07 77
DATE OF INSPECTION: July 13/77 | INSPECTOR: PS | I 80377
REMARKS: CSS.S8 | P 95 | WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

MOE HTML Well Record- #7272952

Concession	
County/District/Municipality	OTTAWA-CARLETON
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 463965 Northing: 5035624
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	5 ft	BACKFILL	
5 ft	123 ft	QUICK GROUT	

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Abandoned-Other

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 1119

Results of Well Yield Testing

After test of well yield, water was

If pumping discontinued, give reason

Pump intake set at

Pumping Rate

Duration of Pumping

Final water level

If flowing give rate

Recommended pump depth

Recommended pump rate

Well Production

Disinfected? Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z237003

Date Well Completed: September 07, 2016

Date Well Record Received by MOE: October 11, 2016

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* N/A

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	ARCADIS CANADA, INC		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
329 Churchill Ave North, Unit 200	Ottawa	Ont	K1Z 5B8	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
#1830 TRIM ROAD	ORLEANS		

County/District/Municipality	City/Town/Village	Province	Postal Code
OTTAWA CARLETON	ORLEANS	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	463965	5035624		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
			8" DRILLED WELL ABANDONMENT	0'	123'

NO TAG. / NO MOE WWR
PHOTOS ATTACHED

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
123'	5'	QUICK GROUT	12 Bags
5'	0'	BACKFILL	

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Status of Well

☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☒ Abandoned, other, *specify* NEW CONSTRUCTION ☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water	Other, specify
	☐ Fresh ☐ Untested ☐ Gas	
	☐ Fresh ☐ Untested ☐ Gas	
	☐ Fresh ☐ Untested ☐ Gas	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping _____ hrs + _____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

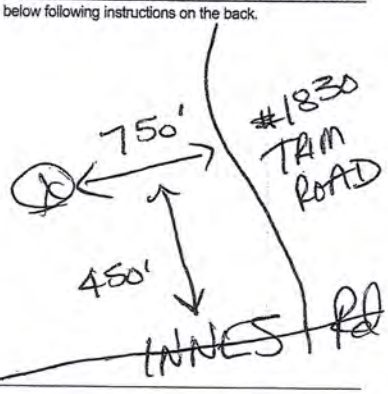
Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
AIRROCK DRILLING CO LTD	1119

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
RR#1	RICHMOND	ONT	K0A 2Z0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
6138382170	Desaulniers, Ken	T4		2016/09/30

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☒ No	[illegible]	2016/09/07

Ministry Use Only

Audit No. Z237003

Received

0506E (2014/11)

Ministry's Copy

© Queen's Printer for Ontario, 2014

Potable Wells in Vicinity of the 1830 Trim Road, Ottawa, Property
FirstGroup America
1830 Trim Road
Orleans, Ontairo

ARCADIS Design & Consultancy for natural and built assets

Ontario Borehole ID	MOE WellRecord #	Inferred Address	Use	Date Completed	Static water level (m)	Water encountered (m)	Pump set depth (m)	Depth to Bedrock (ft)	Depth to Bedrock (m)	Overburden or Bedrock pumping well	Approx. Distance from Site Building (m)
10034766	1512778	-	domestic	1964-02-11	7.6	-	18.3	101	30.7848	overburden	416
10038629	1516731	-	domestic	1978-03-11	4.6	-	9.1	102	31.0896	overburden	491
10034767	1512779	777 Safari	domestic	1965-03-15	9.1	-	15.2	98	29.8704	overburden	500
10034765	1512777	793 Safari	domestic	1958-11-09	3.7	32.3	-	100	30.48	Bedrock	259
10034499	1512510	805 Safari	domestic	1972-02-08	5.5	32.3	9.1	106	32.3088	overburden	280
11172512	1534760	1970 Trim Rd	domestic	2004-06-18	7.7	31.1	24.4	not reached	31.1 m end of drill hole	overburden	477
10034764	1512776	27 Writh St	domestic	1961-03-30	5.5	28.6	7.6	not reached - 94 ft	28.65 m end of drill hole	overburden	286
10037794	1515855	1869 Trim	domestic	1976-08-25	4.6	33.5	9.1	105	32.004	Bedrock	300
10045062	1520493	-	industrial	1989-06-03	9.1	-	36.6	125	38.1	@overburden/ bedrock contact	300
10034763	1523287	-	domestic	1960-12-17	5.8	-	7.6	not reached - 100 ft	30.48 m end of drill hole	overburden	566

NOTE:
a: Water Well locations based from data available on ontariogroundwater.com
b: Aquifer source inferred as gravel/sand seam found just above bedrock depth (at 30m bgs +/-)
- : Information not available

APPENDIX G

Plan of Survey

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

SURVEYOR'S REAL PROPERTY REPORT – PART 1

PLAN OF
PART OF LOT 'A'
CONCESSION 9
GEOGRAPHIC TOWNSHIP OF CUMBERLAND
Now CITY OF OTTAWA

SCALE 1 : 500
0 10 20 50 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

REGISTERED PLAN 4M-1241 BLOCK 102 BLOCK 103 BLOCK 104 BLOCK 105
PART 12, PLAN 4D-103
PART 13, PLAN 4D-103
SUBJECT TO EASEMENT INST CU18002
PIN 14531-2399
Hydro Tower Base
SSIB (857)
N 77° 25' 30" W 64.90
PART 3, 4R-28690
PART 4, 4R-15043 PIN 14531-2401
PART 4 50R-5951
PART 3 50R-5951
IB (AOG) 2.60
SIB (AOG) 14.94
0.65
7.10
SIB (1473)
N77°24'40"W (M) (N76°43'50"W P3) 14.79
PART 4, 4R-28690
PART 5, 4R-28690
PIN 14531-2402
R=330.58 (P&S)
Arc=101.41
C=101.01
N85°38'52"W (M) (N87°57'10"W P3)
Chain Link Fence with Barb Wire Overhang (0.3 Northeast)
Fence 0.5 South
Fence 0.2 South
Fence 0.5 South
UP
SIB (857)
SIB (1473)
Fence 0.4 South 0.4 West
Wall 0.15 East
4.08 (M) (4.08 P3)
PART 6, 4R-28690
BLOCK 183 (Road Widening) PIN 14531-3315
BLOCK 182 (Road Widening)
PART 30, 4R-22040 PIN 14531-4005
PART 28, 4R-22040 PIN 14531-4007
PART 27, 4R-22040 PIN 14531-4008
PART 26, 4R-22040 PIN 14531-4004
PART 24, 4R-22040 PIN 14531-4006
PART 23, 4R-22040
PART 25, 4R-22040
PART 22, 4R-22040
PART 21, 4R-22040
PART 20, 4R-22040
PART 19, 4R-22040
PART 18, 4R-22040
PART 17, 4R-22040
PART 16, 4R-22040
PART 15, 4R-22040
PART 14, 4R-22040
PART 13, 4R-22040
PART 12, 4R-22040
PART 11, 4R-22040
PART 10, 4R-22040
PART 9, 4R-22040
PART 8, 4R-22040
PART 7, 4R-22040
PART 6, 4R-22040
PART 5, 4R-22040
PART 4, 4R-22040
PART 3, 4R-22040
PART 2, 4R-22040
PART 1, 4R-22040
PIN 14531-3995
PIN 14531-3994
PIN 14531-3993
PIN 14531-3992
PIN 14531-3991
PIN 14531-3990
PIN 14531-3989
PIN 14531-3988
PIN 14531-3987
PIN 14531-3986
PIN 14531-3985
PIN 14531-3984
PIN 14531-3983
PIN 14531-3982
PIN 14531-3981
PIN 14531-3980
PIN 14531-3979
PIN 14531-3978
PIN 14531-3977
PIN 14531-3976
PIN

APPENDIX H

Curricula Vitae

Barry H. Cooke, P.Eng.

Senior Consultant

Education

B.Eng. Civil Engineering, McGill University, 1975

Cost Engineering, University of Toronto, 1985

Project Management, University of Toronto, 1986

Inchcape Executive Management Training, Cornell University, 1993

Finance & Accounting Fundamentals, American Management Association, 1995

Contaminated & Hazardous Waste Site Management, Gowen Environmental, 1996

Years of Experience

Total – 41

With ARCADIS – 3

Professional Affiliations

Professional Engineers Ontario (Designated Consulting Engineer)

Order of Engineers of Quebec

The Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories

Association of Professional Engineers and Geoscientists of Alberta

Canadian Geotechnical Society

Tunnelling Association of Canada

Mr.Cooke is a Senior Consultant at ARCADIS, and has a background in geotechnical and geo-environmental engineering. He is involved in a wide range of projects including subsurface contamination investigations; geotechnical studies and analyses; erosion control; environmental audits; environmental liability assessments; and the development, design and supervision of site remediation programs. He is a Qualified Person as designated by the MOE for preparation of Records of Site Conditions based on Phase I and II ESAs and Risk Assessments, and is a Designated Consulting Engineer by Professional Engineers Ontario..

Work Experience

- **2015 – Present** ARCADIS Canada Inc., Richmond Hill, Ontario
- **2013 – 2015** ARCADIS SENES Canada Inc. (dba DCS), Richmond Hill, Ontario
- **1996 – 2013** Decommissioning Consulting Services Limited, Richmond Hill, Ontario
- **2015 – Present** Senior Consultant
- **2002 – 2015** Vice President
- **1996 – 2002** General Manager, Geo-Environmental Services

Project Experience

- Project director for twelve geotechnical programs on the CityPlace lands in downtown Toronto in support of the residential condominium, parkland and infrastructure works on the 16 ha site.
- Project Director for a detailed geotechnical investigation as part of a zero incremental load foundation design for the Main John Street Pumping Station distribution line that transect one of the CityPlace development blocks.
- Providing peer review of geotechnical aspects of a proposed Ritz Carlton resort on Rose Island, and the Ginn sur Mer development on Grand Bahama Island, both in the Bahamas.
- Project manager for construction of a new ash landfill cell in an area of discontinuous permafrost near Calstock, Ontario, and for preparation of closure plan for the landfill.
- DCS, working through its affiliate, SENES Consultants Limited, has completed geotechnical investigations for gas fired power plants at three locations in Ontario for TransCanada Energy: Halton Hills; Oakville and Cambridge.
- Initial investigations began at the Halton Hills site, just north of Highway 401 near Milton in 2006 and consisted on drilling 20 boreholes to bedrock to depths ranging from 15 to 25 m. Bedrock was cored in NQ3 size in several boreholes and samples recovered for strength testing. Geotechnical engineering reports were prepared providing the results of the boreholes and recommendations to guide the design and construction of the foundations of the plant. Settlement sensitive components of the power plant are supported on steel piles driven to refusal on the shale bedrock underlying the site. DCS subsequently completed additional geotechnical investigations and detailed slope stability analyses to assess the long term stability of the banks of a tributary to 16 Mile Creek that traversed the site. As well, DCS completed hydrogeological investigations regarding the effect that water migrating from a stormwater pond as groundwater might have on the water temperature of the 16 Mile Creek tributary, considered to be a cold water fish habitat.

DCS assisted TransCanada Energy in the procurement of a Permit to Take Water during construction, and monitored groundwater levels for two years in several monitoring wells. During construction, DCS provided input to TransCanada in their dealings with neighbouring property owners and their concerns about the possible impact construction activities might have on their potable groundwater wells.

- Preliminary geotechnical investigations were completed in 2008 at the Cambridge site as part of due diligence completed by TransCanada prior to its acquisition of the property. Several boreholes were drilled to refusal on the relatively shallow sedimentary bedrock. A report was prepared providing the results of the boreholes and recommendations to guide the design and construction of the foundations of the plant.
- Preliminary and detailed geotechnical investigations were completed at the site of the Oakville plant, located south of the Ford Motor complex adjacent to the QEW Highway, on a parcel of Ford land that formerly housed the diesel fired power plant and a 1,000,000 gallon water reservoir. Dozens of boreholes were drilled into the Queenston Formation shallow shale bedrock across the site and cores submitted for strength testing. A comprehensive geotechnical report was prepared providing the results of the field and laboratory testing and recommendations to guide the design and construction of the foundations and other subsurface elements of the plant. Given the large size of the plant substantial loads would be transmitted to the bedrock.
- Project Director for the slope stability assessment as well as a sediment pond failure assessment for the TransCanada Energy Halton Hills Power Station. Both programs involved reviewing the existing site conditions and borehole data to prepare a model of the site conditions for use in the respective assessment programs.
- Provided senior technical input to a geotechnical analyses, including slope stability calculations, for a residential subdivision in Bolton, Ontario. The project involved assessing the subsurface soil and groundwater parameters within the proposed development, and modelling various building designs and earthquake loadings with respect to slope stability.
- Principal responsible for geotechnical foundation inspections on 17 residential CityPlace condominium tower blocks which included underground parking structures. Foundation systems where a mix of caissons and spread footings founded on bedrock and engineered fill. In addition the completion of a plate load test on the shale bedrock underlying the CityPlace site in support of the geotechnical report for four of the block developments.
- Prepared remediation plan and cost estimates to remove over 1000 m3 of soil contaminated with PCBs at a surfactant manufacturing plant near Orillia. The plant was over 100 years old and extensive shoring and underpinning was required to preserve the structural integrity of the building.
- Project manager for geotechnical investigation and construction supervision of City Place Golf Centre on former Railway Lands in downtown Toronto. The project featured 30 poles up to 45 m in height which supported the driving range netting system.

1989-1996 – Inchcape Testing Services NA Ltd. (formerly Warnock Hersey)

General Manager

Managed the Ontario and Atlantic Operations. Fully responsible for P&L, sales, engineering/testing operations and new business development. Managed up to 60 employees through six direct reports. As part of regional management team, played a key role in developing and implementing company's strategies and objectives. Worked closely with offices in Canada, U.S.A. and worldwide.

1987-1989 – Bruce A. Brown Associates Ltd.

Vice President

Responsible for managing geotechnical and environmental investigations, including:

- ongoing studies of environmental contamination, and its remediation, of the former railway lands near SkyDome;
- geotechnical and environmental investigations for railway lands in the West Don Lands and in eastern Toronto;
- geotechnical and environmental investigations for the redevelopment of the Weston Sewage Treatment Plant into two 29 storey residential towers;
- geotechnical and environmental investigations for the redevelopment of the Massey Ferguson properties in Toronto.

1975-1987 – Lavalin Inc. (now SNC-Lavalin Inc.)

Junior Engineer to Senior Project Engineer

Participated in, and managed, hundreds of engineering studies across Canada and internationally, including:

- Engineering studies of several mine tailings disposal schemes including grass roots designs of facilities for Inco in Copper Cliff, Ontario; BP Resources at Hope Brook, Nfld.; CalGraphite in Burk's Falls, Ontario; and Falconbridge in Winston Lake, Ontario; and studies on existing tailings areas for Inco in Copper Cliff, Ontario; Falconbridge in Garson, Ontario; Gaspé Copper Mines in Murdochville, Québec; Cogema in Rabbit Lake, Saskatchewan and Amok in Cluff Lake, Saskatchewan.
- Geotechnical studies for the SkyDome Stadium in Toronto. Project featured mass excavation below the level of Lake Ontario through contaminated soils, into shale bedrock which possessed clay seams and fractured zones. Comprehensive plate load tests on the shale bedrock were carried out to accurately determine the stress strain characteristics of the bearing formation.
- Geotechnical studies for the John Street Pumping Station, which was relocated to make way for the SkyDome Stadium. Project featured tunnels beneath the SkyDome and adjacent structures, in shale bedrock known to squeeze significantly over time. Complex laboratory testing was

performed to determine stress-strain-time relationships to aid in tunnel lining design. Monitoring of tunnel squeeze during construction was carried out.

- Studies in The Gambia to locate reserves of road building materials. The absence of hard rock in the country led to the decision to use crushed cockle shells as a coarse aggregate, and an extensive test pit exploration program, employing over 70 local workers, was undertaken to locate new deposits of shells.
- Supervision of the construction of a 3 km-long earth irrigation dam in northern Nigeria. Special aspects of the work included ensuring that adequate compaction of laterite core was consistently achieved in a semi-desert environment.
- Geotechnical investigation for a 40 km-long water supply pipeline for Yaounde, Cameroon. Terrain traversed included rivers, jungles and foothills.

Professional Activities

- Tunnelling Association of Canada
  Treasurer, 1989-1993
  Associate Editor of Canadian Tunnelling, 1993-2006

- Canadian Council of Independent Laboratories
  (formerly Canadian Testing Association)
  National Director, 1990-1992, 1993-1996
  Vice President, Ontario Chapter, 1986-1990
  President, Ontario Chapter, 1990-1992
  Chair, Conformity Assessment Division, 1993-1996
  Newsletter Editor, 1995-1996

Publications

- Design of buried structures in squeezing rock in Toronto, Canada, with K.Y. Lo and D.D. Dunbar. Canadian Geotechnical Journal, 1987, Vol. 24, pp. 232-241.

- Foundation design for the SkyDome Stadium, Toronto, with K.Y. Lo, Canadian Geotechnical Journal, 1989, Vol. 26, pp. 22-33.

STEPHANIE JOYCE

ENVIRONMENTAL SCIENTIST

EDUCATION

M.Sc. Environmental Science
University of Alberta, Edmonton
1999

B.Sc.H. Chemistry
Queen's University, Kingston
1997

YEARS OF EXPERIENCE

Total – 12 Years
With Arcadis – 2.5 Years

PROFESSIONAL REGISTRATIONS

Association of the Chemical Profession of Ontario

CORE SKILLS

1. Project Management
2. Environmental Site Assessments
3. Long Term Monitoring
4. Northern Logistics

QUALIFICATIONS

- Certified Project Manager, Arcadis (2015)
- Standard First Aid (2016)
- Petroleum-Oriented Safety Training (2017)

Stephanie is a Project Manager with Arcadis Canada Inc., located in their Ottawa Office. She has over 12 years of experience in environmental consulting, specializing in environmental site assessments, long term monitoring and regulatory applications. She lived and worked in Yellowknife, Northwest Territories for over 8 of her years, becoming familiar with the northern environment, logistics and regulatory processes. Stephanie has completed over 60 Phase I, II and III ESAs, in the Northwest Territories, Nunavut and Ontario. Sites have included eight heli-bases and two air tanker bases across the NWT, abandoned mines in the NWT, two float plane bases in Inuvik, NWT, the ferry landing Fort Providence, NWT, a former gas station in Alberta, an automotive centre in Yellowknife, the Robert O. Pickard Environmental Centre (ROPEC), the wastewater treatment facility for the City of Ottawa, community tank farms in eight Nunavut communities and other commercial, industrial and residential sites. Her clients have included primarily federal, territorial and municipal government departments.

Work Experience

2014-Present	Arcadis Canada Inc.
2013-2014	WCI Environmental Solutions Inc.
2001-2012	Dillon Consulting Limited
1999-2001	Public Works and Government Services Canada (2 6-month contracts)

Selected Project Experience

PHASE I, II and III ENVIRONMENTAL SITE ASSESSMENTS

Environmental Investigations at the Former Rayrock Mine

Former Rayrock Mine, Northwest Territories (2015 – present)

Under contract with PWGSC, environmental investigations were conducted at the former Rayrock mine site in 2015 and 2016. The former Rayrock mine is located approximately 145 km northwest of Yellowknife. There is no overnight accommodation, so the site is accessed daily via float plane from Yellowknife. Investigations included site stabilization activities (e.g. hazardous and non-hazardous material abatement, trail clearing, vent raise assessments), Phase I and II Environmental Site Assessments

Project Experience, Continued

(ESA) of five satellite exploration sites, Sherman Lake camp and the Barge Landing on Marion Lake, Phase III ESA of a 600 m drainage course on the site and a hydrogeology study.

Local labourers were contracted to collected hazardous and non-hazardous wastes. Thirty-five wooden crates were flown into the site and assembled during the 2016 field program. Approximately 80 bags of asbestos-containing materials and hazardous materials were collected, bagged and placed in the wooden crates for storage.
Five satellite exploration sites were accessed via helicopter in 2015 for the purposes of conducting a Phase I/II ESA, in accordance with CSA standards. Two additional sites, the Sherman Lake camp and the Barge landing, were assessed in 2016. During the site visits, Areas of Potential Environment Concern (APEC) were identified. Test pits were advanced in these areas and soil samples were collected and analyzed for contaminants of potential concern. Analytical results were compared to the CCME Canadian Environmental Quality Guidelines and the Canada wide Standard for Petroleum Hydrocarbons in Soil. Surface water samples were collected if present in an APEC. At the Barge Landing, a gamma survey was conducted to measure radiation levels at the site.
An initial test-pitting program was designed in 2015 for the 600 m Mill Creek drainage course. After metal and radionuclide (Lead-210 and Radium -226) impacts were identified, a follow-up investigation was designed for 2016, to delineate and characterize the results and assess contaminant movement along the drainage course. Sediment samples were collected in both the upstream and downstream water bodies, to assist in site characterization and provide data for future risk assessment.
As Project Coordinator, Stephanie was responsible for project planning and preparation, coordination of field logistics, report preparation, budget tracking and client liaison. The complex field programs, involving retention of several sub-contractors, coordination of an aboriginal environmental technician for job shadowing purposes and transportation of equipment and field supplies to site via float plane was planned and executed successfully within a very tight timeframe. Four reports were produced following each field season. Stephanie authored three of the reports each year, coordinating staff in several offices to compile the field data, analyze the results and present the results in concise, accurate reports.

Phase II ESA, Preliminary Quantitative Risk Assessment and Tender Document Preparation for Remediation/Risk Management Activities of St. Laurent Square

Ottawa, Ontario (2015-2016)

A Phase II ESA was conducted on the property located in downtown Ottawa. Contaminants of concern were petroleum hydrocarbons, polycyclic aromatic hydrocarbons and metals. The data were used to prepare a Phase II ESA report as well as a preliminary quantitative risk assessment (PQRA).
Following the PQRA, tender documents were prepared for the remediation and risk management activities planned at the site. Additional tasks included development of a Class “A” cost estimate, completion of groundwater sample collection at the site, revision of the NCSCS score for the site, translation of the drawings and translation review of the specifications. Unique challenges included a changing scope (i.e., addition of several supplemental tasks in short succession), considerable media attention and a very tight schedule for the entire project.

Project Experience, Continued

Phase I ESA of Robert O. Pickard Environmental Centre
Ottawa, Ontario

Project coordinator for conducting the Phase I Environmental Site Assessment of the Robert O. Pickard Environmental Centre (ROPEC), the wastewater treatment facility for the City of Ottawa. ROPEC is located on a 60 hectare area of land that includes 15 buildings, 15 primary clarifiers, eight aeration tanks, 16 secondary clarifiers, three contact chambers, six digesters, an underground tunnel system and the associated piping, pumps and infrastructure.

Phase I/II/III Environmental Site Assessments
Various Sites in Ontario, Northwest Territories and Nunavut

Project manager and/or project coordinator for conducting numerous Phase I, II and III ESAs in the Northwest Territories, Nunavut and Ontario. Sites have included abandoned mines, former gas stations, an automotive centre and other commercial, industrial and residential sites. Clients have ranged from the private sector, a mining company, and various municipal, territorial/provincial and federal government departments.

ENVIRONMENTAL MONITORING

Long Term Monitoring at DEW Line Sites
Various Remote Sites in Nunavut (2015 – present)

Long term monitoring activities were conducted at various Distant Early Warning (DEW) Line sites in both 2015 and 2016 for Indigenous and Northern Affairs Canada (INAC). Four sites were scheduled in 2015 (PIN-B, PIN-D, FOX-C and Cape Christian), however only three were visited due to inclement weather conditions. An additional four sites were visited in 2016 (FOX-C, CAM-D, Roberts Bay, Ennadai Lake), as well as the Former North Rankin Nickel Mine, in Rankin Inlet. The DEW Line sites are located in remote Nunavut, generally accessed by chartered plane from a nearby community.

The DEW Line sites were remediated over several years. Non-hazardous wastes were placed in a Non-Hazardous Waste Landfill (NHWL) designed and built at each site. The focus of the LTM activities is the NHWL and include a visual inspection, photographic record and groundwater and/or surface water sample collection. At Roberts Bay, three thermistor strings equipped with data loggers are installed within the NHWL. Arcadis was responsible for downloading data from the data loggers and replacing the data loggers themselves with new batteries.

The Former North Rankin Nickel Mine was remediated in 1997. Remedial activities included placing all tailings in a deep pond (water was drained), and installing a cover. LTM activities have occurred since that time, but inconsistently. Arcadis was retained to conduct another year of LTM activities and formalize the LTM Plan for future monitoring activities. LTM activities included a visual inspection, photo documentation, surface and sediment sample collection and thermal monitoring. Concerns about the site included the presence of acid-generating material on top of the tailings cover, potential seepage from the tailings cover and the state of the tailings themselves (tailings need to remain frozen to limit contaminant migration).

As Project Manager, Stephanie was responsible for project planning, coordination, field logistics, reporting, budget tracking and client liaison. An aboriginal environmental technician was hired to assist at a few of the sites, gaining hands-on field experience. Logistics were extremely important for this project, as all sub-contractors, equipment, supplies and materials had to be coordinated, with little room for error. Due to inclement

Project Experience, Continued

weather, delays were encountered during the field programs. Stephanie and the field team adapted to the changing conditions, communicating regularly with the client. Following the field program, results were presented in clear, accurate reports, noting changes observed over the years.

Groundwater Monitoring (2016)
Onefour Research Substation, Alberta

Project Manager for groundwater and surface water monitoring at the Onefour Research Substation, located in rural Alberta. Groundwater and surface water samples were collected from designated locations. Analytical results were compared to guidelines and previous monitoring results. Concerns about the site included the identification of a true background sample and whether reported exceedances were a result of impacts from the landfill, or natural background concentrations. Recommendations regarding future monitoring were made and summarized in a report.

Water Quality Monitoring at the Colomac Mine
Former Colomac Mine, Northwest Territories (2005-2006, 2008-2009, 2011-2012)

Colomac is an abandoned gold mine, located approximately 400 km north of Yellowknife. As a condition of its water license, issued by the Wek'eezhii Land and Water Board (WLWB), water monitoring was required as part of the Surveillance Network Program (SNP). INAC contracted an environmental consultant to conduct the routine water quality monitoring monthly during periods of open water and once under ice in the spring.
First as Project Manager (2005-2006) and then Project Advisor (2008-2009, 2011-2012), Stephanie was responsible for project management, coordination and completion of field work, chemical analysis of dissolved phosphate, ammonia nitrogen and thiocyanate in the on-site laboratory, data analysis and report preparation. Water samples were collected from 28 locations, accessed by boat, ATV, snowmobile, float plane and foot. Logistics had to be coordinated between the field team, the air charter company, the on-site contractor and the client. All data was uploaded into a customized database, to facilitate data evaluation. Quarterly monitoring reports were prepared, as well as an Annual SNP Summary report, submitted to the WLWB. This project began in 2005, and continued through to 2012 (although scope was reduced in latter years).

Long Term Monitoring Plan Development – Discovery Mine
Former Discovery Mine, Northwest Territories (2016)

At the request of Indigenous and Northern Affairs Canada, Arcadis prepared a LTM Plan for the former Discovery Mine. Discovery Mine is a former gold mine, located on the west shore of Giauque Lake, approximately 85 km northeast of Yellowknife.
As a Specialist on the project team, Stephanie provided guidance on the groundwater monitoring aspects of the LTM Plan. She reviewed previous reports, compiled data and recommended requirements for the LTM Plan. For each component of the site, LTM Plan requirements were summarized (e.g. activity and frequency), planned maintenance activities were outlined and triggers for contingency actions were developed. A risk management assessment for each component requiring LTM was completed.

Project Experience, Continued

Annual Monitoring and Operating Report for Trail and Nepean Landfill Sites

Ottawa, Ontario

Assisted with the Trail and Nepean Landfill Sites 2010 and 2011 Annual Monitoring and Operating Report. Tasks included data compilation and analysis and report preparation for the surface water monitoring stations.

REMEDIAL ACTION PLAN DEVELOPMENT AND REMEDIATION

Tender Document Preparation for Remediation/Risk Management Activities

St. Laurent Square, Ottawa, Ontario

Project Manager for the preparation of tender documents for remediation and risk management activities planned at St. Laurent Square in downtown Ottawa. Additional tasks included development of a Class “A” cost estimate, completion of groundwater sample collection at the site, revision of the NCSCS score for the site, translation of the drawings and translation review of the specifications. Unique challenges included a changing scope (i.e. addition of several supplemental tasks in short succession), considerable media attention and a very tight time schedule for the entire project.

Remedial Action Plan (RAP): Off-Site Property Impacts of Transformer Station

Ignace, Ontario (2015)

Report author for the remediation action plan addressing off-site property impacts at a transformer station in Ignace, Ontario. Polychlorinated biphenyl concentrations above applicable guidelines were observed in soil samples collected from inside and outside of the property line. The remediation plan detailed the excavation and off-site disposal of the impacted soils. The RAP was in accordance with National Energy Board requirements.

Checkpoint Site Remediation

Checkpoint, Northwest Territories (2009-2010)

The Checkpoint Site is located at the intersection of Highways 1 and 7 in the Northwest Territories. Previously used as a storage depot, remediation of the site was planned. Remedial activities included construction of a landfarm and excavation of hydrocarbon-impacted soil. As Project Manager under contract with the Department of Transportation with the Government of the Northwest Territories, Stephanie oversaw the design and construction of the landfarm. The design followed requirements laid out in the Land Use Permit for the site, issued by the Mackenzie Valley Land and Water Board. Construction occurred over several weeks in the fall. A local construction company was retained as the site contractor. Unique challenges included logistic planning as the site is located approximately 60 km from Fort Simpson, across a ferry/ice road (i.e. no access during periods in the spring and fall). As construction occurred in the fall, work had to be completed before the ferry stopped running for the winter. An environmental technician, a member of the local First Nation, was retained to assist with the field work and gain hands one experience.

Project Experience, Continued

Biopile Remediation, Rankin Inlet Airport
Rankin Inlet, Nunavut

Project manager for the aeration, nutrient addition and sampling of a biopile in Rankin Inlet. The biopile was constructed in 2004, but additional excavation was required in 2005. Confirmatory sampling in 2006 indicated that treatment was complete. Responsibilities included project management, coordination and communication between field technicians, contractor and client, and preparation of report.

GUIDANCE DOCUMENT PREPARATION AND REGULATORY EXPERIENCE

Preparation of Guidance Documents on Investigating and Managing the Impacts of Per- and Polyfluoroalkyl Substances (PFAS)
Ottawa, Ontario (2016- present)

As Project Manager, Stephanie coordinated a team of international experts to prepare guidance documents on investigating PFAS impacts. The client was responsible for numerous sites across the country, where fire fighting activities had occurred and wished to conduct PFAS investigations at all the sites. The guidance documents were prepared so that the investigations were conducted consistently, efficiently and cost-effectively across the country. A general guidance document, with background information on PFAS, was prepared, as well as a statement of requirements, which outlined specific requirements of the investigations.

Update of Cost Estimating, Liability Reporting and Contaminated Sites On-Reserve Program Guides, South of 60°
Ottawa, Ontario (2014-2016)

The purpose of this project was to simplify and standardize INAC's liability reporting for their contaminated sites program. Various guides were updated and spreadsheet tools were developed to assist with cost estimates and liability. Responsibilities included client liaison, design of a remediation cost-estimating tool in Excel, update of associated guide and Contaminated Sites On-Reserve Program guide update.

Water License Applications and Regulatory Submissions
Various Clients in the Northwest Territories and Nunavut (2003-2009)

Project coordinator/manager for community water license applications and other regulatory submissions, presented to the MVLWB, the Sahtu Land and Water Board and the Nunavut Water Board, for communities in the Northwest Territories and Nunavut. The application processes involve considerable liaison between the community, the client(s) and the appropriate water board, to ensure a complete application.

LENNART DE GROOT, B.Sc., EP

ENVIRONMENTAL PROFESSIONAL

Environmental Professional (EP) with over 9 years' experience in environmental assessments in the private and public sectors.

EDUCATION

Bachelor of Science in Environmental Technology, Saxion University, 2007, Deventer, the Netherlands, Europe

YEARS OF EXPERIENCE

Total – 9 Years
With Arcadis – 3 Years

PROFESSIONAL REGISTRATIONS

Eco Canada –
Environmental Professional (EP)

CORE SKILLS

1. Phase I/II/III Environmental Site Assessments
2. Remedial Action Plans
3. Management of Small Drinking Water Systems
4. Remediation Specifications

ADDITIONAL EDUCATION AND TRAINING

- Transportation of Dangerous Goods, YOW Canada
- eRailSafe Canada, Canadian Railroad Industry
- Operation of Small Drinking Water Systems, Walkerton Clean Water Centre
- Petroleum Orientated Safety Training (POST) 2017
- Workplace Hazardous Materials Information System Training (WHMIS 1988, 2015)
- Station Safety Awareness for External Contractors, Hydro One Networks Inc.
- Emergency First Aid CPR/AED Level A (Canadian Red Cross), April 2017
- Asbestos Awareness Training (National Environmental Trainers inc., Title 29 CFR 1926.1101.)
- Fall Arrest Protection Awareness Training (YOW Canada Inc.)

Mr. de Groot is an intermediate environmental professional (EP) with 9 years of consulting experience. He has acted as lead field staff on environmental site assessments (ESAs) and monitoring projects in Ontario, Quebec and Northwest Territories. Lennart has successfully coordinated numerous Phase I/II/III ESAs, and has extensive field experience in drilling supervision, soil and groundwater sampling, and in-office reporting. Lennart has also conducted numerous Designated Substance Surveys and Hazardous Waste Audits. Since 2016, Lennart is managing and is the lead field engineer for three small drinking water and waste water systems in Ontario.

Lennart is qualified in several aspects of field investigations including project coordination, supervision, borehole drilling (hollow stem, solid stem, geoprobe, sonic, pionjar), test pitting, water sampling (surface water, waste water, groundwater, drinking water, sewer discharge, water treatment systems), indoor air sampling, hazardous materials sampling (lead, PCBs, Asbestos), waste auditing, and soil/groundwater remediation (in-situ and ex-situ). Mr. de Groot has experience corresponding with federal, provincial, municipal and private clients, contractors and laboratories.

Project Experience

Environmental Site Assessments (Phase I, II, & III ESAs)

Limited Phase II ESA (2017)
588 Booth Street, Ottawa, ON

Mr. de Groot was solely responsible for borehole drilling and soil sampling at this test location. Lennart's responsibilities included soil sampling, site surveying, borehole logging, data analysis, and report drafting. ***Client:*** *City of Ottawa*

Phase II ESA (2016)
76 Inverness Avenue, Ottawa, ON

Mr. de Groot was solely responsible for borehole drilling using a handauger and soil sampling for this project. Lennart's responsibilities included soil sampling, site surveying, borehole logging, data analysis, and report drafting. ***Client:*** *City of Ottawa*

Project Experience, Continued

Phase II ESA (2016)

469 Donald Street, Ottawa, ON

Mr. de Groot was responsible for borehole drilling using a track mounted geoprobe and handauger. Some boreholes were completed by installing monitoring wells. Lennart's responsibilities included soil sampling, site surveying, borehole logging, data analysis, and report drafting. ***Client:*** *City of Ottawa*

Follow-up Phase II ESA (2016)

Berens River Wharf, Berens River, Manitoba

Completed an assessment of a water lot as per the Manitoba provincial guidelines. The Follow-Up Phase II ESA included the collection of soil, groundwater, sediment and surface water samples in the vicinity of identified APECs. The sediment samples were collected for toxicity testing and completed for the amphipod Hyalella azteca based on the Environment Canada biological test method Test for survival and growth in sediment and water. Reporting duties included summarizing results of analysis into tables for reporting, writing the Phase II report and producing final electronic and hard copy versions for submission to the client. ***Client:*** *Public Works and Governmental Services on behalf of Transport Canada*

Phase II/III ESA (2014 – 2017)

Rideau Hall, Ottawa, Ontario

Duties included writing of the technical proposal, the supervision of drilling, and conducting of soil and groundwater sampling for the proposed multi-week field investigation. Writing of the Phase II and Phase III ESA reports followed by the writing of Construction Remediation Specifications. ***Client:*** *National Capital Commission*

Phase II ESA (2016)

Pikangikum First Nation Community, Northern Ontario

Completion of a testpit program including the excavation of 65 testpits and soil sampling, followed by groundwater sampling from pre-installed monitoring wells. ***Client****: Public Works and Governmental Services*

Phase I ESAs (2016)

Manitoulin Island and Arnprior, Ontario

The purpose of both Phase I ESAs was to identify any actual or potential environmental liabilities that have resulted from existing and previous land uses or site development activities on and adjacent to the subject property through a detailed records review and site inspection. The records review included aerial photograph search, database search for applicable records, contacting various health authorities and interviews. Mr. de Groot was responsible for all aspects of both Phase I, including site inspection and reporting. The work was completed in accordance to the requirements outlined in the Canadian Standards Association (CSA) standard CSA Z768-01, Phase I Environmental Site Assessment (CSA, 2012). ***Client:*** *Hydro One Networks*

Phase I ESA (2016)

150 - 158 Dalhousie Street, Ottawa, Ontario

A commercial building, vacant residential house with a garage and two parking lots were inspected for the presence of hazardous materials and potentially contaminating activities. Mr. de Groot was responsible for all aspects of the Phase I, including site inspection, an interview with the owner and reporting. The work was completed in accordance to the requirements outlined in the Canadian

Project Experience, Continued

Standards Association (CSA) standard CSA Z768-01, Phase I Environmental Site Assessment (CSA, 2012). ***Client:*** *the Ottawa Beauty Supply Company*

Phase II/III ESA and Benthic Survey (2014)

Portsmouth Olympic Harbour, Kingston, Ontario

Part of a field team collecting sediment, surface water and groundwater samples. Field duties included conducting surface water and sediment sampling using a ponar type grab sample from a rental boat to examine harbour sediment and surface water conditions. ***Client****: Public Works and Governmental Services*

Environmental Site Monitoring

Human Health and Ecological Risk Assessment (HHERA) (2017)

Former Rayrock Mine Site, Northwest Territories

The objective of this assessment was to gather information needed to finalize the HHERA. Assisted with the completion of a Vegetation Assessment, Small Animal Sampling and Collection, Fish Sampling and Collection and a Benthic Survey. Working conditions encountered during the three-week field program were working in harsh weather conditions, protection from predatory animals, following communication procedures on site and off site, following radiation safety and precautions and following helicopter and boat safety procedures. ***Client****: Public Works and Governmental Services Canada, Western Region*

Soil, Groundwater and Air Quality Assessment (2016)

RCMP Detachment, Tulita, Northwest Territories

The objective of this assessment was to determine if the hydrocarbon contamination identified in the soil is present in groundwater and if the impacts are migrating off-site. Indoor air sampling in the detachment building was required to ensure that naphthalene and BTEX/PHC concentrations were not continuously exceeding Health Canada's guideline. Duties included the supervision of drilling and installing of monitoring wells, soil sampling and indoor air sampling and the writing of the ESA report. ***Client****: Public Works and Governmental Services*

Provision of Sanitary and Storm Sewer Water Quality Monitoring (2016 - 2017)

University of Ottawa, Ottawa, Ontario

Monthly sampling of waste water throughout the University. Managing sampling bottles and chain of custody forms for provision to the laboratory as well as reporting of results. ***Client:*** *University of Ottawa*

Groundwater, Surface Water and Methane Monitoring (2014 - 2015)

Former McGee Landfill, Ottawa, Ontario

Groundwater Sampling and Elevation Survey of 14 existing site monitoring wells and surrounded surface water bodies. Included well purging and sampling and surface water sampling, as well as recording of field chemistry parameters. In addition, methane vapour testing was conducted from selected monitoring wells. ***Client:*** *National Capital Commission*

Project Experience, Continued

Groundwater Monitoring Program (2014 - 2015)

16 Tauvette Street, Ottawa, Ontario

Continuation of the Natural Attenuation Monitoring Program through sampling of groundwater from 10 existing well installations. The scope of work included monitoring of groundwater for levels of BTEX/PHCs, recording of field chemistry parameters, preparation of chain of custodies and keeping of detailed work logs for future reference. ***Client:*** *National Capital Commission*

Soil Fill Quality Supervision (2015)

LeBreton Flats, Ottawa, Ontario

Conducted field supervision services during the import of fill to confirm that all soil met applicable Site Condition Standards, a project for which Approximately 25,000 m^3 of soil was imported successfully. ***Client:*** *National Capital Commission*

Drinking Water Sampling Program (2014 - 2015)

Various Schools in the Ottawa, Ontario area

Conducted annual drinking water sampling for the Ottawa District School Board for analysis of lead parameters in drinking water as per Ontario Reg. 243/07. Duties included conducting on site sampling and preparation of chain of custodies; as well as the keeping of detailed work logs for future compliance review by the MOE. ***Client:*** *Ottawa-Carleton District School Board*

Monthly Site Inspections (2014)

PLASCO Waste Facility Plant, Ottawa, Ontario

Carried out monthly site inspections of the Plasco *Energy from Waste* Facility in Ottawa, as well as writing of the monthly engineers report. The site inspection included review of the Operations Hourly Checklist, and Waste Tracking Logbook. The purpose of the monthly inspection was to observe and report on the operations of the site to verify compliance with the requirements of the conditions of the Ontario MOE Environmental Compliance Approval. ***Client:*** *Plasco Energy Group Inc.*

Site Remediation

Co-author for Remedial Specifications Preparation (2016)

Resolute Bay, Nunavut

This project included the design and specifications services (including tendering assistance) for the waste consolidation and capping of a former Transport Canada landfill(s) in Resolute Bay, NU. The project included the engineering design services, site remediation design and tender specifications documentation preparation with a Class A Cost estimate to 100% completion. The project included project scheduling, review of previous reporting, and interpretation of all applicable codes and licences. Mr. de Groot assisted in the specification preparation and drafting of all site plans and construction details using AutoCAD. ***Client:*** *Public Works and Governmental Services on behalf of Transport Canada*

Excavation of PHC Impacted Soils (2015 & 2017)

McDowell Lake, Ontario

The program included the on-site collection of soil and surface water samples and excavation of PHC impacted soils into a Biopile. Duties included soil sampling from treated soil stored in a bio-cell. Work required collaboration with the local First Nation Community. ***Client:*** *Nexacor for Bell Canada.*

Project Experience, Continued

Operation of Small Drinking Water and Waste Water Treatment Systems

Inspection and Maintenance of Small Drinking Water and Waste Water Facilities (2016 - 2017)
Ottawa, Cornwall and Summerstown, Ontario

Acting as the lead field engineer to ensure that the water treatment systems perform correctly and consistently. Mr. de Groot is responsible for weekly inspections of the facilities and keeping the systems running by following general equipment inspection and replacement procedures. Conducting of weekly, monthly, quarterly and annual water sampling. Mr. de Groot is the first contact for emergency call up (24/7) in case of equipment malfunction and performing on-site troubleshooting. ***Client:*** *Suncor for Petro-Canada*

Geotechnical Investigations

362 chemin d'Aylmer, Aylmer, Quebec (2015)

Assisted with a geotechnical investigation program to determine subsurface soil and bedrock conditions and to provide geotechnical comments and recommendations to guide the design and construction of the foundations for a proposed building structure. Work included the supervision of the field investigation program, borehole logging of the geotechnical investigation and writing of a Geotechnical report. ***Client:*** *Private Company*

Kemptville, Ontario (2014)

Assisted with field supervision of drilling for purposes of a geotechnical investigation, description of soil characteristics and conducting of a land elevation survey. ***Client:*** *LA Group Inc.*

140 Springhurst. Ottawa, Ontario (2014)

Assisted with a geotechnical investigation program to provide a report to the City of Ottawa building department requirements. Field work included borehole logging of the geotechnical investigation, as well as preparing samples for pH and corrosivity analysis, moisture content, and grain size analysis. Client: Private Company.

Designated Substances Surveys and Waste Audits

Asbestos Abatement of a Boiler Room (2016)
305 Metcalfe Street. Ottawa, Ontario

The boiler room was surveyed for designated substances (asbestos). Duties for this job included the on-site investigation as well as cataloging samples for laboratory submission, compiling site photographs into reportable formats, as well as general project administration. Sampling was performed using phase contrast microscopy (PCM) methodology. Reporting duties included organizing sample data for completing chain of custody. Clearance air sampling was conducted following completion of the Type 3 asbestos abatement work in the boiler room. ***Client:*** *Hollyburn Properties Ltd.*

Project Experience, Continued

Waste Reduction and Management Program (2014 - 2017)

NAV Canada Centre, Cornwall, Ontario

Conducting an annual waste audit at the NAV Canada Centre (2014, 2015, 2016, 2017). Project duties included cataloging and calculating representative waste volumes and analyzing procedures of waste production and collection for the purposes of creating more environmentally responsible waste management practices. ***Client:*** *NAV Canada*

Pre-demolition Designated Substances Surveys and Waste Audits (2015)

14 National Capital Commission Properties, Gatineau area, Quebec

The project required the surveying of 14 NCC owned properties located in Quebec (Gatineau Park and Lac Phillipe), as well as the conducting of Class D waste estimates for future demolition purposes. As well as being the lead field investigator and sampler for 7 of the properties, duties included creating detailed site plans and report writing of the Designated Substances Survey and Waste Audits. ***Client:*** *National Capital Commission*

Pre-demolition Designated Substances and Hazardous Waste Survey (2017)

1979 Matheson Drive, Smith Falls, Ontario

Project included collection of building material samples such as tiles, paint and suspected asbestos containing materials and inspecting hazardous waste material in an office building/garage. Mr. de Groot was responsible for coordination of field activities, collection of materials samples, inspection of fluorescent light ballasts, and photographic records.

Client: *Valero Energy Corporation.*

Designated Substances Survey (2015)

Residential House, Gatineau, Quebec

Duties for this job included the on-site investigation and cataloguing of samples for laboratory submission, compiling site photographs, as well as general project administration. Reporting the findings of the survey, labeling and organizing sample data for completing chain of custody, and summarizing results of analysis into tables. ***Client:*** *Private Client*

Designated Substances Survey (2015)

1190 Montreal Road, Ottawa, Ontario

Control and Relay Buildings were surveyed for designated substances. Duties for this job included the on-site investigation as well as cataloging samples for laboratory submission, compiling site photographs into reportable formats, as well as general project administration. Reporting duties included organizing sample data for completing chain of custody, and summarizing results of analysis into tables for reporting, writing the report and producing final electronic and hard copy versions for submission to the client. ***Client:*** *Hydro One Networks Inc.*

December 2007 – September 2013

Consultant in soil research and remediation for several Engineering & Consultancy firms and the Provincial Government in the Netherlands, Europe [Geofox-Lexmond (2007-2008), Oranjewoud (2008-2010), Provincial Government of Gelderland (2010-2011), Greenhouse Advies (2012-2013)].

Project Experience, Continued

Selected Publications

Review of Scientific Literature on the Co-Product of Biogas Production (2011)

Provided literature review which was tailored to inform experts from technical organisations and governmental institutions that are dealing with household biogas digesters. The outcomes were published in the following report:

> De Groot, L. and Bogdanski, A. (2013) *Bioslurry = Brown Gold?* United Nations Food and Agriculture Organisation (FAO), Environment and Natural Resources Management Working Paper, number 55.

Responsibilities included: researching, analysing and reporting on various technical aspects of a biodigester, e.g. the production of biogas and bio-slurry, efficiency of the digester, comparisons between biodigesters and a energy balance. Reviewed peer-literature articles regarding the uses of bio-slurry and their implications for small-scale farmers in developing countries and completed a technical paper regarding the use of bio-slurry by small-scale farmers in developing countries.

Troy Austrins, P.Eng., PMP, QP_{ESA}

Project Manager; Geo-Environmental Engineer

Education

B.Eng., Civil Engineering, Ryerson Polytechnical University, Toronto, Ontario, 1991

Environmental Science & Engineering Certificate, Ryerson Polytechnical University, Toronto, Ontario, 2002

Years of Experience

Total – 23
With ARCADIS – 14

Professional Affiliations

Professional Engineers of Ontario;
Associate of Professional Engineers (BC)
Ontario Society of Professional Engineers;
Canadian Geotechnical Society
PMI- Ottawa chapter

Additional Education and Training

2015 HAZWOPER –Refresher; Radiation Safety, Gauge Operation, Transportation of Dangerous Goods,
Class 7 Radioactive Radioisotope Licenses and Other Regulatory Requirements, Emergency Procedures- AECBC

2014 Operation of Small Drinking Water systems; Emergency Level 1st Aid/CPR-AED; (updated in 2013)

2007 Fall Arrest; Confined Space; WHMIS Training; Pleasure Craft Operator

2005 40-hour HAZWOPER

2002 Hydro One- Electrical Safety Awareness course, including on-site grounding/bonding instruction; Traffic Control Training

Mr. Austrins is a Project Manager and a Geo-Environmental Engineer in the ARCADIS Canada Inc. Ottawa office. He is responsible for completion of environmental site assessments, hazardous materials surveys and contaminated site remediation projects in addition to landfill monitoring + design, environmental and associated auditing programs. Responsibilities as a project manager include indoor air quality assessments, designated substances surveys (DSS), mould and asbestos assessments, and the design and completion of Phase I, II, & III environmental site audits, waste audits, fuel storage tank compliance auditing and remediation projects. Mr. Austrins is a registered 'Qualified Person' with the Ontario Environment Ministry to review and perform Phase I, Phase II and Phase III ESAs. Mr. Austrins also is involved with projects requiring Geotechnical Investigations or slope stability evaluations.

Project Experience

2001-present – ARCADIS Canada Inc., Ottawa

NCC- former McGee Farm Landfill –site monitoring 2011 through to 2016
Former McGee Farm Landfill Groundwater, Surface Water, and Methane Monitoring Program for the National Capital Commission (NCC). As project manager, Mr. Austrins coordinated all field programs; supervised the PQRA development and biological survey of the former landfill, and completed all semi-annual and annual monitoring reports for years 2011 through 2015. Mr. Austrins provided recommendations for revision and managed revision of all monitoring programs, supervised staff, acted as client liason, as well as reviewed and signed off on all deliverables to the client.

CNL-AECL Chalk River Bulk Materials Landfill project (2006 design, 2010 construction, 2016 Phase 2design, 2017 Phase2construction), completed site construction supervision and review of as-built elements. Reviewed HDPE and geosynthetics supplied to work site. Provided response to construction staff change orders. Evaluated leachate holding tanks and clay liner appropriateness. Provided final commissioning documentation: 2010 Construction Supervision stage. Landfill Design / Design and Operations Manual- 2006/2007: Assisted in initial landfill design and conducted geotechnical investigation to evaluate chosen landfill site appropriateness. Worked closely with landfill construction team to resolve issues with late materials deliveries, sourcing replacement acceptable landfill appurtenances, evaluating issues with compaction and clay source difficulties, responding to same-day requests for site inspections and work progress approvals.

CST Inc. (Ultramar)- Princess Ave.- Kingston, ONT 2014 to present
Mr. Austrins acted as senior reviewer at ARCADIS to oversee an Infrastructure Removal Program and conduct a Phase II ESA and Supplemental Phase II ESA for a CST (Ultramar) property located in Kingston, Ontario (2014). At the time of the Phase II ESA, the site was developed with one single-storey building, petroleum storage and handling equipment (diesel and gasoline pump islands), and a propane storage and handling facility. There were 5 USTs along with gasoline, diesel, and kerosene distribution piping (between the former USTs and the former pump islands) and vent piping. The completed excavation covered an area of approximately 144 m2. Upon completion of the infrastructure removal program ARCADIS advanced

a test pitting program and borehole/monitoring program of 11 boreholes and 3 monitoring wells, conducted to further delineate the identified petroleum impacted soil. A follow-up Phase II ESA was prepared to include coring through the floor of the existing site building. ARCADIS successfully delineated PHC impacted soils, and remedial recommendations were provided. Mr. Austrins oversaw the remediation program for the property and reviewed the need for building shoring/underpinning during excavation and contaminated soil removal operations. ARACADIS acted as General Contractor for the remediation program to arrange for excavation, disposal, site restoration and contract negotiations.

National Capital Commission- Operations Zone Ottawa, ONT 2013 to present
Mr. Austrins acted as Project manager for Phase II/III ESAs at Rideau Hall, Ottawa (2014-2015). ARCADIS was retained by The National Capital Commission to complete Phase II and III ESAs at the NCC Operations Zone, Car Garage, and Sugar Bush project areas. A comprehensive borehole and monitoring well investigation was implemented to successfully meet the difficulties of delineating a PHC contaminant plume within shallow bedrock. Mr. Austrins was also project manager for the Site Specific Risk Assessment (SSRA) prepared for the Sugar Bush Area. In the previous year, Mr. Austrins supervised the preparation of a Geotechnical Investigation report for this same Operations Zone site. All reporting was prepared on time and budget to meet client requirements.

Kingsview Landfill – NCC: Project manager in 2012 Shoreline Erosion Evaluation and 2015 for Phase II ESA. For the investigation of contaminant concentrations in exposed shoreline ash and debris from the former Kinsgview landfill site in Ottawa (closed in 1925): samples were secured from two different depths and at two sampling points for each of 44 sampling locations. Mr. Austrins was project manager for the prepared Erosion Control Plan and PQRA to assess potential contaminant impact. Mr. Austrins also created a Phase II ESA work program and sampling plan in 2015 for the on-going assessment the condition of the previously implemented constructed soil cap, and to identify any potential negative environmental impacts to soil and groundwater at the site by way of 8 borehole and monitoring well installations, and subsequent low flow groundwater sampling.

Plasco Trail Road- monthly environmental monitoring and inspection conducted at Plasco Waste Gasification demonstration project and Proposed Former Landfill Development Site 2010-2014. Plasco Trail Road- monthly environmental monitoring and inspection conducted at Plasco Waste Gasification demonstration project in 2010/2011/2012. Monthly inspections conducted to ensure compliance with MOE guidelines and Certificates of Authorization. Mr. Austrins conducted sampling of landfill leachate at the Plasco Moodie Drive proposed development site, located adjacent to the closed City of Ottawa Nepean landfill.

NCC Groundwater Monitoring project at Mooney's Bay Park/Landfill, Ottawa 2013-2015. Mr. Austrins was project manager for the program to determine site groundwater contaminant impacts resulting from poor quality land fill and debris. Monitoring Recommendations were provided and Mr. Austrins also managed the eventual decommissioning of the on-site monitoring wells.

CST Inc. (Ultramar) - Pembroke, ONT 2014

Senior reviewer for completed Phase II ESA at a planned car rental depot, located in Pembroke, Ontario (2014). Site was used for uncharacterized/unregulated landfilling to significant depths. The ESA was required by the client CST (Ultramar) as part of their environmental assessment protocol prior to the potential acquisition of the site. Mr. Austrins also supervised geotechnical field staff and wrote the geotechnical report for the proposed site infrastructure. Foundation designs required modification to account for the significant mixed fill thickness.

Grant Forest Products Landfill Reporting (2005). Mr. Austrins provided for the review of groundwater monitoring and annual landfill reporting for the Grant Forest Products (Englehart, Ontario) for submission to the MOE over two successive annual reporting periods.

PWGSC – Portsmouth Harbour, Kingston, ONT 2014

Project manager, Portsmouth Harbour– Phase I/II ESA, Kingston, ON. Completed for PWGSC, on behalf of Department of Fisheries and Oceans (2014). Sampling was completed for soil, groundwater, sediment and surface water as well as benthic invertebrates. An assessment of abandoned USTs and existing ASTs was completed. Eleven boreholes were completed along with fifteen sediment sampling locations. NCSCS and ASCS scoring worksheets were completed in addition to Contaminated Site Module forms and third-party reporting. Remedial options and cost estimates to complete recommended programs were provided.

345-349 Booth Street; Ontario numbered company – Ottawa, ONT 2010 - 2014

Principal engineer and project manager for Environmental Site Assessment, Remediation, Record of Site Condition, at former Auto Garage and Auto-body Shop, Booth Street, Ottawa (2010-2012). ARCADIS was retained to complete a Phase I/II ESA for a large property on Booth Street which held both an Auto Service Station and Auto-body repair shop. The Phase I/II was completed in advance of sale of the property. The new owners again retained ARCADIS to complete updated Phase I/II ESA reporting to meet O.Reg. 153/04 requirements. Soil remediation using an excavate and removal protocol was completed to address residual metals and PHC contamination in shallow soil. Site Monitoring Wells were decommissioned by ARCADIS. The new owner required a Record of Site Condition (RSC) to be filed due to the intended change from commercial to residential land use. Mr. Austrins completed the RSC submission and Brownfield Grant applications to the City of Ottawa on behalf of the new property owner.

Infrastructure Ontario- MNR Pembroke, ONT; Phase III ESA 2011

Project manager for Phase II ESA 31 Riverside Drive (MNR building and yard) property in Pembroke, Ontario (2011). The site consisted of a main office building, on-site garage, a works garage, other smaller storage buildings or sheds, a pump house located near the Ottawa River, and other forested areas. Ground penetrating radar (GPR) scanning was undertaken to evaluate for the presence of residual underground storage tanks or other subsurface anomalies. Ten boreholes were advanced and 6 monitoring wells were installed along with advancement of 22 test pits. Soil and groundwater contamination was detected in the vicinity of the arbour (or former gasoline UST location) and in the vicinity of a former aviation fuelling AST with PHC and BTEX parameters above applicable guidelines. One Ottawa River shoreline sand sample also contained concentrations of benzene and xylenes which exceeded the Table 9 Standards. ARCADIS successfully delineated the extent of the PHC contaminants impacting site soil and groundwater. A Remedial/Risk Management Options Feasibility Study (ROFS) was also provided by ARCADIS.

OTHER PROJECTS: 1992-2001 — Bruce A Brown Associates Limited, Toronto, Ontario-

Islington Ave. Landfill Assessment: co-ordination of Passive Methane venting system installation including contractor & landfill arrangement, backfill control, excavation face sampling, laboratory submissions, compaction testing and final reporting for many sites in the Greater Toronto area and Hamilton/Burlington region. Liaison with Ministry of Environment, completed quarterly to bi-annual methane monitoring and checks on the efficacy of the passive venting system.

Alisha Williamson, C. Tech

Environmental Technologist – Field Assessor

Education Environmental
Technician Diploma, Fleming College, 2013.
Environmental Technologist Advanced Diploma, Fleming College, 2013

Years of Experience
Total – 3.5 year(s)
With ARCADIS – 2.5 year(s)

Professional Qualifications
Canadian Red Cross First Aid Standard First Aid + Level C CPR (July 2016)
eRail Safe (Canadian Pacific/CN) (August 2014)
Government Security Clearance – Reliability Status (October 2014)
OBBM-Ontario Benthos Biomonitoring Network (April 2014)
Operation of Conventional Water Treatment Processes (February 2013)
Pleasure Craft Operator Permit (November 2012)
POST Certification (January 2016)
TransCanada Health, Safety and Environment Orientation (September 2016)
Wetland Classification (October 2013)
WHMIS (2016)

Alisha Williamson is a Junior Technologist with ARCADIS. She has acted as lead field staff on ESA and monitoring projects in the Ottawa and Northern Ontario regions. Her Phase I/II/III ESA field experience includes drilling supervision, soil and groundwater sampling, and in-office reporting duties.

Work Experience

- ARCADIS Canada Inc., Ottawa, Ontario (August 2014 to Present),
- City of Kawartha Lakes, Lindsay, Ontario (April 2014),
- Fleming College, Lindsay, Ontario (September 2013-April 2014).

Project Experience

Environmental Site Assessments/Investigations (Phase I, II and III ESAS)

- Phase II Environmental Site Assessment. Ottawa, ON. September 2016.
- Phase I and Phase II Environmental Site Assessments completed to CSA standards, Ottawa, ON. 2015. Ms. Williamson completed the collection of site background information, conducted sample collection, and is currently co-authoring the technical report. Client: Arnon Corporation
- Phase I and Phase II Environmental Site Assessments completed to CSA standards, Ottawa, ON. 2015-current. Ms. Williamson completed the collection of site background information, conducted sample collection, and is currently co-authoring the technical report. Client: Arnon Corporation
- Phase One Environmental Site Assessment completed to O. Reg. 153/04, Brockville, ON. 2014-2015. Ms. Williamson assisted in the collection of information, information placed in the technical report, and final editing of the report. Client: Sanmina-SCI
- Phase III conducted in Indian Head, Saskatchewan. 2014. The objective of this project was to delineate contamination on site. Ms. Williamson was responsible for site visits, groundwater, surface water, soil, and sediment sample collection, and reporting. Client: Public Works and Government Services Canada (PWGSC)
- 18 Modified Phase I Environmental Site Assessments (ESA) conducted at multiple locations in Saskatchewan. 2014. The objective of this project was to complete Modified Canadian Standards Association (CSA) Phase I ESAs at the 18 sites. Ms. Williamson was responsible for conducting the site visits, collecting soil samples, and reporting. Client: Public Works and Government Services Canada (PWGSC)
- Phase III Environmental Site Assessment, Brockville, Ontario. 2014-2015. Ms. Williamson completed the quarterly field work for the project in November of 2014 and January 2015. Field activities included monitoring and sampling groundwater to further delineate the extent of contaminants as well as determine the functionality of the well injection program happening on site. She was responsible for the site inspection, collection of samples, and analytical results analysis. Client: Sanmina-SCI

Environmental Monitoring

- Ongoing site monitoring in, Resolute Bay, Nunavut. August 2016. Ms. Williamson participated in the ongoing monitoring and sampling program to assess ground water conditions at landfill treatment units. Ms. Williamson's responsibilities included groundwater sampling and analytical results analysis. Client: PSPC
- Ongoing site monitoring in, Eureka, Nunavut. August 2015. Ms. Williamson participated in the ongoing monitoring and sampling program to assess ground water conditions at a former tank farm. Ms. Williamson's responsibilities included groundwater sampling, surface water sampling, sediment sampling and soil sampling. Client: PSPC
- Phase III Environmental Site Assessment, Brockville, Ontario. 2014-2015. Ms. Williamson completed the quarterly field work for the project in November of 2014 and January 2015. Field activities included monitoring and sampling groundwater to further delineate the extent of contaminants as well as determine the functionality of the well injection program happening on site. She was responsible for the site inspection, collection of samples, and analytical results analysis. Client: Sanmina-SCI
- Monitoring program for Compressor Station 144, Brockville, ON. October 2014 and October 2016. Ms. Williamson's responsibilities included soil, sediment, and surface water sampling. Ms. Williamson also assisted in writing the technical report for the project. Client: TransCanada PipeLines Ltd.
- Ongoing site monitoring program in Ignace, ON. 2014-2016. Completed activities included the coordination of field activities, collection of quarterly ground water samples and analytical results analysis. Data from the monitoring reports was incorporated into a long term site management strategy, developed for the site. Client: Canadian Pacific Rail
- Ongoing site monitoring program in Chapleau, ON. 2014-2016. Completed activities included the coordination of field activities, collection of semi-annual ground water samples, collection of semi-annual surface water samples, and analytical results analysis. Data from the monitoring reports was incorporated into a long term site management strategy, developed for the site. Client: Canadian Pacific Rail
- Ongoing site monitoring program in Bainsville, Ontario. 2014. Ms. Williamson participated in the ongoing monitoring and sampling program to assess ground water conditions at a former highway travel centre. Ms. Williamson's responsibilities included groundwater sampling and analytical results analysis. Client: Husky Oil Operations Ltd
- Ongoing site monitoring program in Ottawa, ON. 2014. Ms. Williamson was responsible for monitoring and sampling of groundwater. Client: Confidential
- Ongoing site monitoring program of area for saline (salt) concentrations. 2013. Completed activities included collecting and interpreting analytical data. Data from the monitoring project was incorporated into a long term report, whereby future data could be easily added to the ongoing study. Client: Fleming College, Environmental Technician/Technologist Program

Site Remediation

- On Site Remediation. July 2015 to present. Ms. Williamson is involved in the upkeep and monitoring of on-site pumping system for PHC contamination. Client: Confidential.
- Junior Environmental Technologist, Enhanced Bioremediation, Ottawa, Ontario. December 2014.Cleaning solvents (perchloroethylene, PCE) and its breakdown products including vinyl chloride were identified in soil and ground water above Ontario O.Reg. 153/04 Standards underneath and around the dry cleaning facility. Ms. Williamson is currently participating in the enhanced bioremediation program. Client: Confidential

APPENDIX I

MECP PSF Response Form

Ministry of the Environment and Climate Change

Standards Development Branch
7th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2

Ministère de l'Environnement et de l'Action en matière de changement climatique

Direction de l'élaboration des normes
7e étage
40 avenue St. Clair ouest
Toronto ON M4V 1M2

March 13, 2017

FirstCanada ULC
600 Vine Street Unit 1400
Cincinnati, Ohio 45202 USA

Attention: Ms. Susan Kirkpatrick

RE: **Ministry comments for the PSF for 1830 Trim Road, Ottawa, Ontario, report prepared by Arcadis Canada Inc., dated October 2016 [PSF1557-16, IDS No. 1000-AFCQ3N].**

This letter will acknowledge receipt of the Pre Submission Form (PSF) submitted for the following Property under the Records of Site Condition Regulation (O. Reg. 153/04).

- **Pre-Submission Form for 1830 Trim Road, Ottawa, Ontario, report prepared by Arcadis Canada Inc., dated October 25, 2016**

The Ministry has reviewed the PSF submitted for the Property. Our reviewers offer comments, and questions in the attached Schedule A for the proponent's consideration in preparing a risk assessment for submission under the *Environmental Protection Act* (Act), Ontario Regulation 153/04 (Regulation), and associated guidance documents.

The outcome of this preliminary consultation is not binding on the risk assessment property owner or the Ministry, as the understanding of site conditions may develop and/or change during the course of the risk assessment. For this reason, the Ministry has the right to change its position. Ministry comments on the PSF do not in any way indicate acceptance of the final risk assessment approach or other conclusions of the risk assessment report and it does not indicate acceptance of the risk assessment report by the Director pursuant to s.168.5 of the Act.

If, at any time after submitting the PSF, the qualified person responsible for the preparation of the risk assessment changes or the property owner changes, the property owner shall give notice to the Director of the change in circumstance.

Seven hard copies of the risk assessment are to be submitted to the Director of the Environmental Assessment and Approvals Branch for review under the Regulation and

must include a copy of the PSF as well as a response in the risk assessment report outlining how the Ministry's concerns in Schedule A to this letter were addressed in the risk assessment.

Please note that a risk assessment under the Regulation does not deal with all potential approvals and issues associated with other Ministry legislation. Other regulatory and compliance tools are required to address other aspects of redevelopment of this property including:

- disposal of excess soil,
- potential for release of contaminants to the environment during remediation and construction activities,
- remedial activities which require Certificates of Approvals, and
- off-site impacts.

Off-site impacts, actual or likely, must be reported to the Ministry District Office forthwith. For your information the Act, Regulation, guidance documents and associated fact sheets have been posted to the following site:

http://www.ontario.ca/environment-and-energy/brownfields-redevelopment

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Craig Kinch
Director, Environmental Protection Act s. 168.5

Attach:

SCHEDULE A
To Director's Notice dated March 13, 2017

Comments by Ministry of Environment and Climate Change On Pre-Submission Form

1830 Trim Road, Ottawa, Ontario
PSF1557-16
(IDS Ref No. 1000-AFCQ3N)

The following are Ministry comments on the following Pre-Submission Form (PSF):

- **Pre-Submission Form for 1830 Trim Road, Ottawa, Ontario, report prepared by Arcadis Canada Inc., dated October 2016**

Ministry reviewers offer comments, observations and questions, as follow, for the proponent's consideration in preparing a risk assessment for submission under the Records of Site Condition Regulation, O. Reg. 153/04 (Regulation).

Comments provided by the Ministry on the content of this Pre-Submission Form are not in any way a Director's response to a risk assessment referred to in subsection 168.5 of the EPA.

It also should be noted that a risk assessment submitted to the Ministry under the Regulation must include all mandatory requirements for risk assessments as listed in Table 1 of Schedule C of the Regulation. These requirements must be met or the risk assessment will be deemed incomplete and may be returned without further review.

It should also be noted that a risk assessment submitted to the Ministry under the Regulation must include a copy of the PSF as well as a response outlining how the comments in this Ministry review have been considered in the risk assessment.

The Regulation, guidance documents and associated fact sheets have been prepared to assist proponents. They can be found posted to the following site:

http://www.ene.gov.on.ca/environment/en/subject/brownfields/index.htm

Timeline for Review of Risk Assessment

The proposed Risk Assessment (RA) will be a RA other than those identified in O. Reg. 153/04, Schedule C, Part II. Therefore, the review timeline for the RA will be set at 16 weeks. Section 46 of the Regulation provides specified maximum timelines for review of a RA by the Ministry. The Ministry's timeline for review of the RA under Section 46 of the Regulation will commence on receipt by the Ministry of a risk assessment in accordance with Section 2 of Schedule C of the Regulation.

COMMENTS ON PRE-SUBMISSION FORM

The following comments pertain to the Pre-Submission Form (PSF) for 1830 Trim Road, Ottawa, Ontario, report prepared by Arcadis Canada Inc., dated October 2016

General Comments

A risk assessment pre-submission form was completed for the property located at 1830 Trim Road, Ottawa, Ontario. The current landuse of the property is commercial. The proposed landuse for the property is residential. The Site is not considered environmental sensitive as per O. Reg. 153/04, as amended. It is proposed that non-potable full depth Site Condition Standards (Table 3) are applicable for the property. It is proposed that a streamlined Tier 3 risk assessment be completed for the Site. In addition, cobalt and vanadium are considered to be associated with background sources. Contingent on the results of the risk assessment, risk management measures may be required to mitigate human health and/or ecological risks.

Specific Review Comments

HHRA Comments

1. **Figures – HHCSM with Risk Management Measures (RMM)** – This figure was not provided and is required by Ontario Regulation 153/04 Schedule C, s.3(9) (b). The reviewer notes that fill material will be remediated prior to completion of the risk assessment and no risk management is identified; however, for the completeness of the PSF a HHCSM with RMM should be included.

ERA Comments

2. **Figures – EcoCSM with Risk Management Measures (RMM)** – This figure was not provided and is required by Ontario Regulation 153/04 Schedule C, s.3(9) (b). The reviewer notes that fill material will be remediated prior to completion of the risk assessment and no risk management other than implementation of a MEP approach is identified; however, for the completeness of the PSF an EcoCSM with RMM should be included.
3. The PSF indicates that there are no water bodies on or within 30 m of the site but does not provide details related to other water bodies that could present habitat for aquatic receptors and VECs. In addition, the potential for leaching of COCs from soil and subsequent migration should be considered in the risk assessment.

General Comments

1. The reviewer notes that this PSF was submitted as part of a "Streamlined Tier 3" Risk Assessment. A "Streamlined Tier 3" risk assessment is no longer an option from the MOECC with the release of the updated MGRA model.
2. Arcadis states that although a PSF was submitted, their intention is to proceed with a Tier 2 risk assessment, if the use of documented background concentrations for cobalt and vanadium are approved by the MOECC. This approach appears reasonable based on the supporting information provided in the PSF.
3. Note, if a Tier 2 risk assessment approach is taken, the new updated MGRA Model should be used.
4. In the letter to the Municipality that indicates the intent to assess the property using non-potable groundwater standards, it should request the municipality to respond to the notice and to indicate whether the municipality objects to the assumption being made regarding non-potable standards, if there is an objection, the reasons for it.

EEASIB Phase Two Conceptual Site Model Comments

1. Clause 16(2)(a) of Schedule D – The table of areas of potential environmental concern (APECs) is required to be completed in a form approved by the Director as part of the phase one environmental site assessment (ESA). The Ministry has noted several issues with the table of APECs, including:
    - It appears as though the qualified person (QP) has lumped together multiple on-site potentially contaminating activities (PCAs) into a single APEC (APEC 1 and APEC 3). By definition, each PCA must have a corresponding APEC and the QP is required to conduct subsequent activities in accordance with the regulatory requirements before a RSC can be submitted for filing. Also, specific locations of on-site PCAs (i.e. any above ground or underground storage tanks, oil/water separators, hydraulic hoists, solvent, petroleum, and waste oil storage, etc.) should be provided in the table. Sufficient sampling of each APEC (as described below) is required.
    - Two salt bins were identified on site; however, they were not considered by the QP to be APECs. It is unclear why this was the case.
    - An overhead transformer was reportedly located on the east side of the property. Transformer use falls under PCA #55, and therefore must be considered an APEC.

2. Section 5, paragraphs 2 and 3 of Schedule E – One of the specific objectives of the site investigation component of a phase two environmental site assessment ESA is to confirm whether contaminants are present on, in or under the phase two property, and, if so, what the contaminants are, where they are located on, in or under the phase two property and at what concentrations. Another specific objective is to determine whether any contaminants on, in or under the phase two property are present at concentrations higher than applicable site condition standards by, among other things, investigating and characterizing soil, ground water and sediment on, in or under the phase two property. Based on the information presented in the table of APECs and the phase two conceptual

site model (CSM) submitted with the RSC, these two objectives were not met for the following reasons:

- Soil and ground water samples were not collected from areas of PCAs a) to f) within APEC 1.
- Soil and ground water samples were not collected from the septic field and tank located within APEC 2a.
- Soil samples were not collected at the former fuel island located within APEC 5.
- Ground water samples were not collected from APECs 4 and 7.
- Soil samples were not collected from the location of the overhead transformer located on the east side of the property. Transformer use falls under PCA #55, and therefore must be considered an APEC.
- In reviewing cross-sections provided in the CSM, it is unclear if soil samples were collected at the water table in order to assess potential soil impacts in the vicinity of APEC 1, APECs 2b and 2c, and APEC 5; where the maximum concentration of potential petroleum hydrocarbon impacts would be expected to be found.
- Soil and ground water samples were not collected from the area of the southwest salt bin (adjacent to the former fuel island).

3. Section 8, paragraph 2 of Schedule E – This section specifies the requirements for a ground water sampling method to be used to characterize contamination or determine if the concentration of a contaminant is above, at or below an applicable site condition standard or standard specified in a risk assessment for the contaminant. Where petroleum hydrocarbons or light non-aqueous phase liquids may be present on, in or under the phase two property, sampling depth intervals, including screened intervals of monitoring wells, shall be positioned to intersect the water table. Based on the information presented in the phase two conceptual site model (CSM), it appears that the water table is located above the top of the screened intervals.

4. Section 43 and Table 1, Report Section 6, Sub-Heading (x) of Schedule E – The phase two CSM submitted with the RSC is required to demonstrate the current condition of the phase two property or, where remedial actions have been undertaken, the condition of the phase two property before the remedial actions were undertaken. The following information is missing from the phase two CSM:

   - A description of, and, as appropriate, figures illustrating the physical setting of the phase two property and any areas under it including:
     a. hydrogeological characteristics, including aquifers, aquitards and, in each hydrostratigraphic unit where one or more contaminants are present at concentrations above the applicable site condition standards, lateral and vertical hydraulic gradients, and
     b. approximate depth to water table.

   According to the QP, measured water levels were above the tops of screens at each of the monitoring wells during both sampling events (except for MW16-5 on March 1, 2016), therefore a precise determination about depth to the water table,

ground water flow direction and hydraulic gradient could not be made. This information is required to be included in the phase two CSM.

- Where contaminants on, in or under the phase two property are present at concentrations greater than the applicable site condition standard, one or more cross-sections showing the lateral and vertical distribution of a contaminant in each area where the contaminant is present at concentrations greater than the applicable site condition standard in soil, ground water and sediment. Based on the current plan view and cross-sectional diagrams (i.e., Figures 5 to 11) included in the Phase two CSM, it is unclear whether vertical delineation has been achieved as per Subsection 7(1) of Schedule E for electrical conductivity, free cyanide and petroleum hydrocarbon fractions (PHC) F3 and F4 in soil.

5. Subsection 47(15) of Schedule E – Figures, maps, site plans and cross-sections are required to contain a scale, north arrow and a title block that includes a descriptive title, the address of the phase two property, if any, the name of the qualified person's (QP's) firm, company or partnership, if any; and the date the figure, map, site plan or cross-section was created. The following issues were identified:
    - A former drinking water well appears to be shown on the figures, however, the well symbol is not included in the legend.
    - APEC 5 was identified in Figure 3 and the text of the phase two conceptual site model as the former location of diesel USTs. However, the two tanks shown in the figure are labeled as propane tanks. Please clarify.

6. To facilitate the P2CSM review, it would be preferable if the QP separated out each contaminant of concern (COC), or groups of COCs, by media, such that the amount of information presented on an individual cross-section or plan view is not overcrowded. Please consider the following suggestions:
    - The QP should separate out COCs by parameter group (e.g.: PHCs, metals, inorganics, pesticides, etc.) and medium in which the COCs are found to exceed the applicable site condition standard.
    - When showing soil data, plan view figures must show both the sampling locations with exceedances above the applicable SCS and sampling locations which met the site condition standard. The depths of all soil samples must be indicated on the plan view.
    - When showing ground water data, plan view figures must show both the sampling locations with exceedances above the applicable site condition standard and sampling locations which met the SCS. The well-screen intervals of all samples must be indicated on the plan view.
    - Similar to the plan view, on the cross-sectional figures, colour coding the specific sampling locations (preferably "red" for exceedances and "green" for those sampling locations meeting the applicable site condition standard) is recommended. This will provide a clear picture of lateral and vertical delineation and will not only demonstrate delineation, which is a requirement of the regulation, but it will reduce the amount of time necessary to review data.

- There should be sets of plan views and cross sections for each parameter group in each medium.

Summary and Conclusions

As per the comments above, additional details related to the risk assessment assumptions and approach should be provided in the risk assessment submission. Also, given that a streamlined Tier 3 option is no longer available, the risk assessment should be submitted in accordance with either an MGRA or Tier III approach.

Important Note: The Ministry's review has concluded that the Phase Two Conceptual Site Model (P2CSM) that was provided with the PSF does not meet all the requirements of Section 8 43 and Table 1, Report Section 6, Sub-Heading (x) of Schedule E. It is strongly recommended that all comments on the P2CSM be fully addressed and the P2CSM updated before submitting the RA. Ministry staff can also provide feedback on the updated P2CSM, if needed. Note that the Ministry will consider your RA submission as incomplete if the P2CSM is not fully compliant with the requirements of Section 43 and Table 1, Report Section 6, Sub-Heading (x) of Schedule E.

If the QPESA has any questions or requires additional clarification related to the P2CSM comments, please contact Aden Takar.

Risk Management Measures (RMMs)

Section 1.4.1 – Preliminary Selection of Risk Management Measures – of Appendix A to the PSF, states in the second paragraph: "*As such, prior to completion of the risk assessment, it is proposed that these fill materials will be remediated to generic Table 3 SCS for these parameters. Therefore, risk management measures will not be required to address these exceedances.*"

At the fourth paragraph and the last sentence of the same section of Appendix A, it is stated: "*...however as discussed above, prior to completion of the risk assessment, these fill materials will be remediated to generic Table 3 SCS for these parameters. No other risk management measures were identified as being required.*"

It is the reviewer's understanding from reading the PSF that no risk management measure is proposed for the property of concern. Risk would be managed by digging the impacted soils (cleanup).

Please note that my review of certain sections of the PSF have led to the identification of the following:

- The site was used for approximately 25 years for the operation (starting & warming up/running of engines may have created cyanides found at the site), maintenance and repairs of motorized vehicles (school buses for the most part);

- The property of concern is in a serviced area, meaning that drinking water is provided by the City of Ottawa MDWS. A non-potable groundwater condition is acceptable;

- Bedrock outcrops do exist in the area. For example, it is the reviewer's understanding that one can find bedrock close to ground surface in the immediate vicinity of the Cardinal Creek Stormwater Management Facility located some 900m to the north of the property of concern. In fact the bedrock outcrops form a ridge that parallels the Ottawa River (south bank being still northwest – north – northeast of the property of concern). It would have been helpful if a borehole had been run down to bedrock at the property of concern to confirm the depth at which it can be found (the 25-30m depth interval was identified, based on two nearby wells). Nevertheless, the reviewer is satisfied that within the (soil) horizon 0-4m depth bgs, clay is predominant;

- The reviewer didn't find any issue with the legal description provided for the property of concern as it accurately matches the area delineated on the OLS' plan of survey;

Environmental Bill of Rights Requirements

For any Property Owner or their Agent with an interest in submitting a Risk Assessment to the Ministry for acceptance under the Environmental Protection Act s. 168.5 we want to bring to your attention important amendments under the Environmental Bill of Rights Act.

Ontario Regulation 681/94, Classification of Proposals for Instruments, under the Environmental Bill of Rights (EBR) has been amended to classify certificates of property use (CPUs) as a class II instrument under the EBR if the certificate of property use relates to a risk assessment submitted to the Ministry on or after October 1, 2005. This amendment was made through O. Reg. 505/05. This classification requires a minimum level of public notification (by the Ministry) prior to issuance of the CPU, including a posting on the EBR, of certificate of property use proposals, and provides third party leave to appeal a decision on a certificate of property use.

All decisions regarding a CPU are subject to the Environmental Bill of Rights (EBR). One purpose of the summary of the Risk Management Plan which must be provided in the Risk Assessment Report under the heading "Risk Management Requirements" is to support these requirements. This summary will allow the Ministry to prepare a notice for the EBR in a timely fashion so as not to delay the processing of the submission. The EBR posting allows public input regarding the pending decision of the Director to issue the CPU under Section 168.6 of the EPA.

The summary provided by the Qualified Person under the heading "Risk Management Requirements" will be posted. The Ministry reserves the right to change the wording of the description, as required, to ensure that the public is correctly notified of the subject of the application. The description should be simple and concise (typically under 100 words) and should include the following information:

- State the risk management measures (indicating the principle equipment and any proposed building or land use restrictions) and on-going monitoring, maintenance and contingency plan requirements.

The Regulation has been filed and can be viewed at e-laws:
http://www.e-laws.gov.on.ca/index.html

SUBMISSION OF RISK ASSESSMENT

Submission of Risk Assessment

Seven copies of the risk assessment should be delivered to:

The Director
Environmental Approvals Access and Service Integration Branch
135 St. Clair Avenue West, 1st Floor
Toronto, ON, M4V 1P5
Telephone 416-314-8001

Of the seven copies, at least one copy must contain the original signature of the QP_{RA} in the section on "mandatory certifications" as required by Section 5 of Schedule C of the Regulation. This original or master copy should be clearly labelled.

Change of Owner or QP_{RA}

Note that Section 3 (13) of Schedule C of the Regulation requires that the Director be notified in writing of a change of Property Owner, or change of QP_{RA}. It is requested that written notification of such a change be submitted to the Director at the above address and by email to the Risk Assessment Coordinator (address below). It is also requested that the notification include a copy of completed sections 1, 9, 10, 11 and 12 of the Pre-Submission Form.

Risk Assessment

Many risk assessments fail because they do not satisfy basic requirements of the Regulation and/or because of misunderstandings about risk assessment processes under the Regulation.

Before submitting a Risk Assessment to the Ministry, it is strongly recommended that the QP_{RA} review the mandatory requirements for risk assessments submitted under the Regulation, as outlined in **Sections 2, 4 and 5, and Table 1 of Schedule C of the Regulation**. As well, the QP_{RA} should refer to the Ministry's *Procedures for Use of Risk Assessment Under Part XV.1 of the Environmental Protection Act* for guidance in how to satisfy the requirements of the Regulation.

Use of Non-Standard Models

Please be advised that if the risk assessment submission uses a computer model as referred to in Schedule C, Section 9(4) and 9(5) of the Regulation, the Risk Assessment will be deemed a 'new science' risk assessment and the review timeline will be set at 22 weeks. Please note that the Qualified Person shall, upon request of the Director, include an electronic copy of the computer model in the risk assessment report in a manner that does not violate any person's copyright or other intellectual property rights.

Property Specific Standards

It is the responsibility of the QP_{RA} to ensure that the property specific standards (PSS) that are developed in the risk assessment (RA) will support filing of a Record of Site Condition (RSC) by the QP_{ESA}. This means that:

1) The correct table of site condition standards (SCS) must be used for selecting contaminants of concern (COC) in the risk assessment, and
2) PSS must be proposed for all COCs.
3) The QP_{RA} and QP_{ESA} must be able to make the requisite certifications in the RA/RSC.
4) Any parameters that do not have a PSS established in the RA must meet the applicable SCS.
5) If the QP_{ESA} finds that the RA does not support filing of the RSC (for example: the RA established PSS that are lower than concentrations found on-site; remediation has failed to reduce concentrations to below the PSS or applicable SCS), a new Pre-Submission Form (PFS) and RA must be submitted to the Ministry for review under the Regulation. RAs, once approved under the Regulation, cannot be 'reopened' or revised.

Regulatory Amendments

The QP_{RA} should note that Ontario has amended O. Reg. 153/04 (Record of Site Condition – Part XV.1 of the Act), made under the Environmental Protection Act. The regulatory amendments came into effect on July 1, 2011.

All RSCs filed after the implementation date must meet the requirements of the amended Regulation. For example, the ESA phase one and phase two reports will need to meet the requirements of the amended Regulation at the time of RSC filing.

ESA Requirements and RSC Filing

Some of the comments included in this document (Schedule A) may be related to the adequacy of the environmental site assessment (ESA) work performed to support the approach and conclusions of the risk assessment (RA). Note that acceptance of the qualified person (QP's) responses on these ESA-related matters will be for the purpose of supporting a decision on the RA only; a full regulatory review of the ESAs will not be conducted as part of any future RA review. The Ministry may undertake a more in depth review of the phase one and phase two ESA reports at the time the record of site condition (RSC) is submitted for filing to ensure that all the regulatory requirements have been met. Information relevant to the phase one and two ESA reports (e.g., table of areas of environmental concern, the conceptual site models) that may be amended as part of the RA should be reflected in updated phase one and two ESA reports prior to submitting RSCs for filing. In addition, if the work on the phase one and two ESA exceeds 18 months prior to the submission date of the RSC, the phase one and two ESA reports will need to be updated prior to submitting RSCs for filing.

If the QP_{ESA} has any questions regarding meeting the ESA requirements at the time of RSC filing, it is suggested that they contact Rose Ash of EAASIB tel: 416-314-9058; email: rosemary.ash@ontario.ca

Questions

If the $QP_{(RA)}$ has questions regarding the application of the Regulation or the above comments, they should be forwarded by email to:

Geoffrey Floyd
Risk Assessment Review Coordinator
Standards Development Branch
geoffrey.floyd@ontario.ca

APPENDIX J

Small Gravel Stockpile Remediation Report

MEMO

ARCADIS Canada Inc.
329 Churchill Ave N
Ottawa, Ontario
K1Z 5B8
Tel 613 721 0555
Fax 613 721 0029
www.arcadis.com

ENVIRONMENT

To:
Ms. Susan Kirkpatrick
Environmental Program Manager
FirstGroup America Inc.
600 Vine Street, Suite 1400
Cincinnati, OH, 45202

From:
Troy Austrins, P.Eng.

Date:
September 1, 2017

ARCADIS Project No.:
450271-000

Subject:
Removal of Small Gravel Stockpile from 1830 Trim Road in Ottawa, Ontario

Dear Ms. Kirkpatrick,

A small granular materials stockpile was identified at the 1830 Trim Road site during our May 2016 site investigation and its volume was estimated to be 45 m^3 (4 m length X 4 m width X 2.8 m high; see location on **Appendix A**). One (1) soil sample was collected from a composite of five samples secured from the sides of the stockpile and analyzed for all contaminants of concern (PHCs, VOCs, metals, inorganics, PAHs and pesticides). Sample SP203 and its duplicate (DUP-6) exceeded the MOECC Table 2 SCS for F3 and F4 PHCs. PHC F3 was analyzed at 1400 µg/g (F3 criterion of 1300 µg/g). Its duplicate sample recorded 1900 µg/g for F3 plus 6300 µg/g for F4 (F4 criterion of 5600 µg/g). No other exceedances were noted. The applicable generic SCSs selected for use at the Site correspond to the MOECC Table 2 (potable groundwater) residential/parkland/institutional (RPI) SCSs.

An additional soil sample from the stockpile was collected during the May 2017 investigation. This sample was submitted for testing of a Toxicity Characteristic Leaching Procedure (TCLP). The TCLP soil sample results indicate that the soil from the small gravel stockpile was classified as a solid, non-hazardous waste.

Following the indication that the soil from the small stockpile was a non-hazardous waste, Arcadis completed the removal of the small stockpile on 13 July 2017. The reason for the stockpile removal was to

ensure that site environmental conditions met Residential MOECC Table 2 standards. Maurice Yelle Excavation Ltd. was contracted to haul the stockpile to the Navan Waste Recycling and Disposal Facility Landfill in Ottawa using a backhoe and transport truck. All former remains of the above-grade small gravel stockpile (111.17 metric tonnes) were removed for off-site landfill disposal. The way bills from the Navan landfill are provided in **Appendix D**.

After the Stockpile was removed from the site, two (2) samples (SP203-1 and SP203-2), plus one duplicate sample (DUP-7), were collected by hand from the underlying material (i.e. not the above-grade stockpiled material) on 25 August 2017. The underlying material consisted of a compact, dense silty sand and gravel fill mix.

The two underlying samples were tested for PHC F1-F4 and BTEX. Sample results show that PHC/BTEX levels in the soil from the underlying material do not exceed applicable MOECC criteria. Therefore, the (underlying) soil and gravel fill mix has not been impacted by PHC/BTEX from the small granular stockpile and that the remediation program was completed successfully. The analytical results for the soil testing carried out are provided in **Table 1 of Appendix B.** Copies of the laboratory Certificates of Analysis are provided in **Appendix C**. Copies of the laboratory Certificates of the TCLP Analysis are provided in report *'Phase Two Environmental Site Assessment, Final Report, 1830 Trim Road, Ottawa, Ontario, dated 20 October 2017 by Arcadis Canada Inc.'*

Please do not hesitate to contact me if any additional assistance can be provided on this request.

Regards,

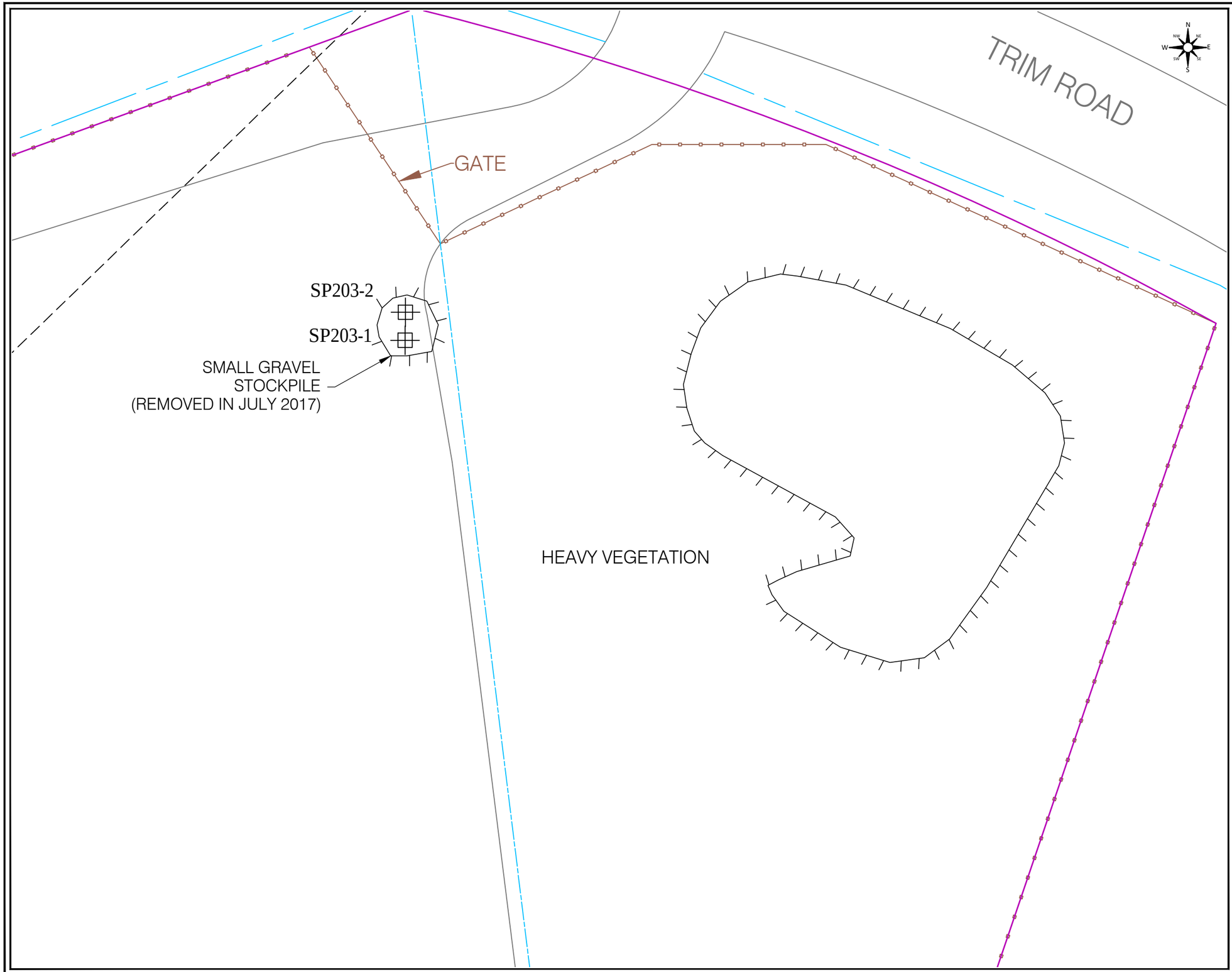
Troy Austrins, P.Eng.
Project Manager

Attachments

Appendix A: Drawing: Site Plan
Appendix B: Table 1- Laboratory Results Summary Table
Appendix C: Laboratory Certificates of Analyses- Soil Analyses
Appendix D: Waybills- Navan Landfill

APPENDIX A

Drawing: Site Plan



LEGEND

- Site Property Line
- Ephemeral Drainage Ditch
- Fence
- Hydro Corridor
- Parking/ Driveway Areas
- Stockpile
- Sample Location (August, 2017)

Reference: Surveyor's Real Property Report,
Fairhall, Moffatt & Woodland
Ref # 137-9 Cumberland

Metres
5 0 5 10
1:500

Title:
Removal of Small Stockpile

Project:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1830 TRIM ROAD, OTTAWA, ONTARIO

Client:
FirstGroup America Inc.

ARCADIS

Date:
OCTOBER 2017

FIGURE 1

last saved 23-Oct-17 by dlogan

z:\projects\2016\450271-000 1830 trim road\figures\1-cad\october2017\450271-000 trim road figure1.dwg

APPENDIX B

Table 1 - Laboratory Results Summary Table

Table 1
SOIL ANALYTICAL RESULTS - PHCs and BTEX
Small Gravel Stockpile Removal
FirstGroup America
1830 Trim Road, Orleans, Ontario

ARCADIS Design & Consultancy for natural and built assets

Arcadis Sample No.	RDL	Units	MOECC Table 2 Standards[1]	SP203-1	DUP-7 duplicate of SP203-1	RPD	SP203-2
Laboratory Sample No.	na	na	na	FAB691	FAB693	na	FAB692
Date Sampled	na	na	na	25-Aug-17	25-Aug-17	na	25-Aug-17
Sample depth (m bgs)	na	na	na	0.15	0.15	na	0.15
CGM Reading (ppmv)	na	na	na	na	na	na	na
Borehole No.	na	na	na	SP203-1	SP203-1	na	SP203-2
Volatile Organics							
Benzene	0.020	µg/g	0.17	<0.020	<0.020	nc	<0.020
Toluene	0.020	µg/g	6	<0.020	<0.020	nc	<0.020
Ethylbenzene	0.020	µg/g	1.6	<0.020	<0.020	nc	<0.020
o-Xylene	0.020	µg/g	-	<0.020	<0.020	nc	<0.020
p+m-Xylene	0.020	µg/g	-	<0.040	<0.040	nc	<0.040
Total Xylenes	0.020	µg/g	25	<0.040	<0.040	nc	<0.040
BTEX & F1 Hydrocarbons							
F1 (C6-C10)	10	µg/g	65	<10	<10	nc	<10
F1 (C6-C10) - BTEX	10	µg/g	65	<10	<10	nc	<10
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	10	µg/g	150	<10	<10	nc	<10
F3 (C16-C34 Hydrocarbons)	50	µg/g	1300	53	54	nc	91
F4 (C34-C50 Hydrocarbons)	50	µg/g	5600	60	71	nc	170

Notes:

[1] Ministry of the Environment and Climate Change (MOECC, 2011a): Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (EPA); April 15, 2011. Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Fine Textured Soils and Residential/Parkland/Institutional Property Use

µg/g micrograms per gram
CGM combustible gas meter
m bgs metres below ground surface
ppmv parts per million by volume equivalent hexane
RDL Laboratory reportable detection limit
RPD Relative percent difference; MOECC recommendations are RPDs < 30% for PHCs in water and soil; <30% for VOCs in water and <50% VOCs in soil
na Not Applicable
nc Not Calculated - one (1) or more concentrations less than 5 times RDL
< #### Concentration less than laboratory RDL or adjusted RDL
< #### Adjusted RDL exceeds the selected MOECC SCS

VALUE **BOLD and UNDERLINED** Value Exceeds MOECC SCS or has an elevated MDL

APPENDIX C

Laboratory Certificates of Analysis - Soil Analyses

Maxxam
A Bureau Veritas Group Company

Your Project #: 450271
Site Location: TRIM ROAD
Your C.O.C. #: 098216

Attention:Troy Austrins

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/09/01
Report #: R4685181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I5566
Received: 2017/08/25, 11:00

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	3	N/A	2017/08/29	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	3	2017/08/30	2017/08/30	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	3	2017/09/01	2017/09/01	CAM SOP-00316	CCME PHC-CWS m
Moisture (1)	3	N/A	2017/08/29	CAM SOP-00445	Carter 2nd ed 51.2 m

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Metals Analysis by ICPMS (1)	2	N/A	2017/08/31	CAM SOP-00447	EPA 6020B m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Your Project #: 450271
Site Location: TRIM ROAD
Your C.O.C. #: 098216

Attention:Troy Austrins

ARCADIS Canada Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2017/09/01
Report #: R4685181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7I5566
Received: 2017/08/25, 11:00

(1) This test was performed by Maxxam Analytics Mississauga
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573

==========

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

Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		FAB691	FAB692	FAB692	FAB693		
Sampling Date		2017/08/25 10:00	2017/08/25 10:30	2017/08/25 10:30	2017/08/25		
COC Number		098216	098216	098216	098216		
	UNITS	**SP203-1**	**SP203-2**	**SP203-2 Lab-Dup**	**DUP-7**	**RDL**	**QC Batch**
Inorganics							
Moisture	%	4.6	3.2	3.3	4.8	1.0	5140588
BTEX & F1 Hydrocarbons							
Benzene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
Toluene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
Ethylbenzene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
o-Xylene	ug/g	<0.020	<0.020		<0.020	0.020	5139558
p+m-Xylene	ug/g	<0.040	<0.040		<0.040	0.040	5139558
Total Xylenes	ug/g	<0.040	<0.040		<0.040	0.040	5139558
F1 (C6-C10)	ug/g	<10	<10		<10	10	5139558
F1 (C6-C10) - BTEX	ug/g	<10	<10		<10	10	5139558
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10		<10	10	5143136
F3 (C16-C34 Hydrocarbons)	ug/g	53	91		54	50	5143136
F4 (C34-C50 Hydrocarbons)	ug/g	60	170		71	50	5143136
Reached Baseline at C50	ug/g	No	No		No		5143136
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	101	99		99		5139558
4-Bromofluorobenzene	%	109	107		106		5139558
D10-Ethylbenzene	%	93	90		94		5139558
D4-1,2-Dichloroethane	%	93	94		92		5139558
o-Terphenyl	%	108	109		108		5143136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FAB691	FAB692	FAB693		
Sampling Date		2017/08/25 10:00	2017/08/25 10:30	2017/08/25		
COC Number		098216	098216	098216		
	UNITS	**SP203-1**	**SP203-2**	**DUP-7**	**RDL**	**QC Batch**
F2-F4 Hydrocarbons						
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	140	580	350	100	5146413

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		FAB690	FAB694		
Sampling Date		2017/08/25 10:00	2017/08/25		
COC Number		098216	098216		
	UNITS	**BH/MW 17-11**	**DUP-8**	**RDL**	**QC Batch**
Metals					
Total Uranium (U)	ug/L	9.2	9.3	0.10	5140383

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

TEST SUMMARY

Maxxam ID: FAB690
Sample ID: BH/MW 17-11
Matrix: Water

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	5140383	N/A	2017/08/31	Matthew Ritenburg

Maxxam ID: FAB691
Sample ID: SP203-1
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5139558	N/A	2017/08/29	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5143136	2017/08/30	2017/08/30	Atoosa Keshavarz
F4G (CCME Hydrocarbons Gravimetric)	BAL	5146413	2017/09/01	2017/09/01	Debra Deslandes
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB692
Sample ID: SP203-2
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5139558	N/A	2017/08/29	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5143136	2017/08/30	2017/08/30	Atoosa Keshavarz
F4G (CCME Hydrocarbons Gravimetric)	BAL	5146413	2017/09/01	2017/09/01	Debra Deslandes
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB692 Dup
Sample ID: SP203-2
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB693
Sample ID: DUP-7
Matrix: Soil

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5139558	N/A	2017/08/29	Joe Paino
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5143136	2017/08/30	2017/08/30	Atoosa Keshavarz
F4G (CCME Hydrocarbons Gravimetric)	BAL	5146413	2017/09/01	2017/09/01	Debra Deslandes
Moisture	BAL	5140588	N/A	2017/08/29	Prgya Panchal

Maxxam ID: FAB694
Sample ID: DUP-8
Matrix: Water

Collected: 2017/08/25
Shipped:
Received: 2017/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	5140383	N/A	2017/08/31	Matthew Ritenburg

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Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

GENERAL COMMENTS

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

Package 1	22.0°C

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7I5566
Report Date: 2017/09/01

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5139558	1,4-Difluorobenzene	2017/08/28	101	60 - 140	102	60 - 140	97	%		
5139558	4-Bromofluorobenzene	2017/08/28	106	60 - 140	104	60 - 140	102	%		
5139558	D10-Ethylbenzene	2017/08/28	89	60 - 140	89	60 - 140	90	%		
5139558	D4-1,2-Dichloroethane	2017/08/28	92	60 - 140	96	60 - 140	88	%		
5143136	o-Terphenyl	2017/08/30	112	60 - 130	104	60 - 130	110	%		
5139558	Benzene	2017/08/28	83	60 - 140	90	60 - 140	<0.020	ug/g	NC	50
5139558	Ethylbenzene	2017/08/28	92	60 - 140	96	60 - 140	<0.020	ug/g	NC	50
5139558	F1 (C6-C10) - BTEX	2017/08/28					<10	ug/g	NC	30
5139558	F1 (C6-C10)	2017/08/28	87	60 - 140	89	80 - 120	<10	ug/g	NC	30
5139558	o-Xylene	2017/08/28	95	60 - 140	99	60 - 140	<0.020	ug/g	NC	50
5139558	p+m-Xylene	2017/08/28	92	60 - 140	95	60 - 140	<0.040	ug/g	NC	50
5139558	Toluene	2017/08/28	86	60 - 140	88	60 - 140	<0.020	ug/g	NC	50
5139558	Total Xylenes	2017/08/28					<0.040	ug/g	NC	50
5140383	Total Uranium (U)	2017/08/31	98	80 - 120	97	80 - 120	<0.10	ug/L		
5140588	Moisture	2017/08/29							3.1	20
5143136	F2 (C10-C16 Hydrocarbons)	2017/08/30	108	50 - 130	104	80 - 120	<10	ug/g	NC	30
5143136	F3 (C16-C34 Hydrocarbons)	2017/08/30	NC	50 - 130	107	80 - 120	<50	ug/g	67 (1)	30
5143136	F4 (C34-C50 Hydrocarbons)	2017/08/30	112	50 - 130	111	80 - 120	<50	ug/g		
5146413	F4G-sg (Grav. Heavy Hydrocarbons)	2017/09/01	71	65 - 135	99	65 - 135	<100	ug/g	NC	50

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

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

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

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

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

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

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

(1) Duplicate results exceeded RPD acceptance criteria for flagged analytes. The sample was reanalyzed with the same result. This is likely due to sample heterogeneity.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B7I5566
Report Date: 2017/09/01

ARCADIS Canada Inc
Client Project #: 450271
Site Location: TRIM ROAD
Sampler Initials: LDG

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD 098216 Page 1 of 1

Invoice Information
Company Name: Arcadis Canada
Contact Name: Troy Austrins
Address: 329 Churchill AV. OTTAWA
Phone: Fax:
Email: Troy.Austrins@Arcadis.com

Report Information (if differs from invoice)
Company Name: Same.
Contact Name:
Address:
Phone: Fax:
Email:

Project Information (where applicable)
Quotation #: Arcadis sop.
P.O. #/ AFE#:
Project #: 450271
Site Location: Trim Road
Site #:
Sampled By: Lennart de Graaf

Turnaround Time (TAT) Required
[X] Regular TAT (5-7 days) Most analyses
PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Rush TAT (Surcharges will be applied)
[X] 1 Day [ ] 2 Days [ ] 3-4 Days
Date Required:
Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153
[ ] Table 1 [X] Res/Park [ ] Med/ Fine
[ ] Table 2 [ ] Ind/Comm [ ] Coarse
[ ] Table 3 [ ] Agri/ Other
[ ] Table ____
FOR RSC (PLEASE CIRCLE) Y / N

Other Regulations
[X] CCME [ ] Sanitary Sewer Bylaw
[ ] MISA [ ] Storm Sewer Bylaw
[ ] PWQO Region
[ ] Other (Specify)
[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE): Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Chloride + Uranium									HOLD- DO NOT ANALYZE
1	BH/MW17-11	2017-08-25	10:00	GW	1	X							X	X								
2																						
3	SP203-1	2017-08-25	10:00	Soil	4		X	X														
4	SP203-2	"	10:30	Soil	4		X	X														
5																						
6	DUP-7	2017-08-25		Soil	4		X	X														
7	DUP-8	"		GW	1	X							X	X								
8																						
9																						
10																						

RECEIVED IN OTTAWA
25-Aug-17 11:00
Alison Cameron
B7I5566
SSR ENV-581

On ice pack

LABORATORY USE ONLY
CUSTODY SEAL Y / N
COOLER TEMPERATURES

Present	Intact	
Y	Y	22, 22, 23
Y	Y	8/7/8

COOLING MEDIA PRESENT: Y / N

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Lennart de Graaf	2017-08-25	11:00	Mariana Damian Kaszan	2017/08/25	11:00
			[signature]	2017/08/25	22:45

MAXXAM JOB #

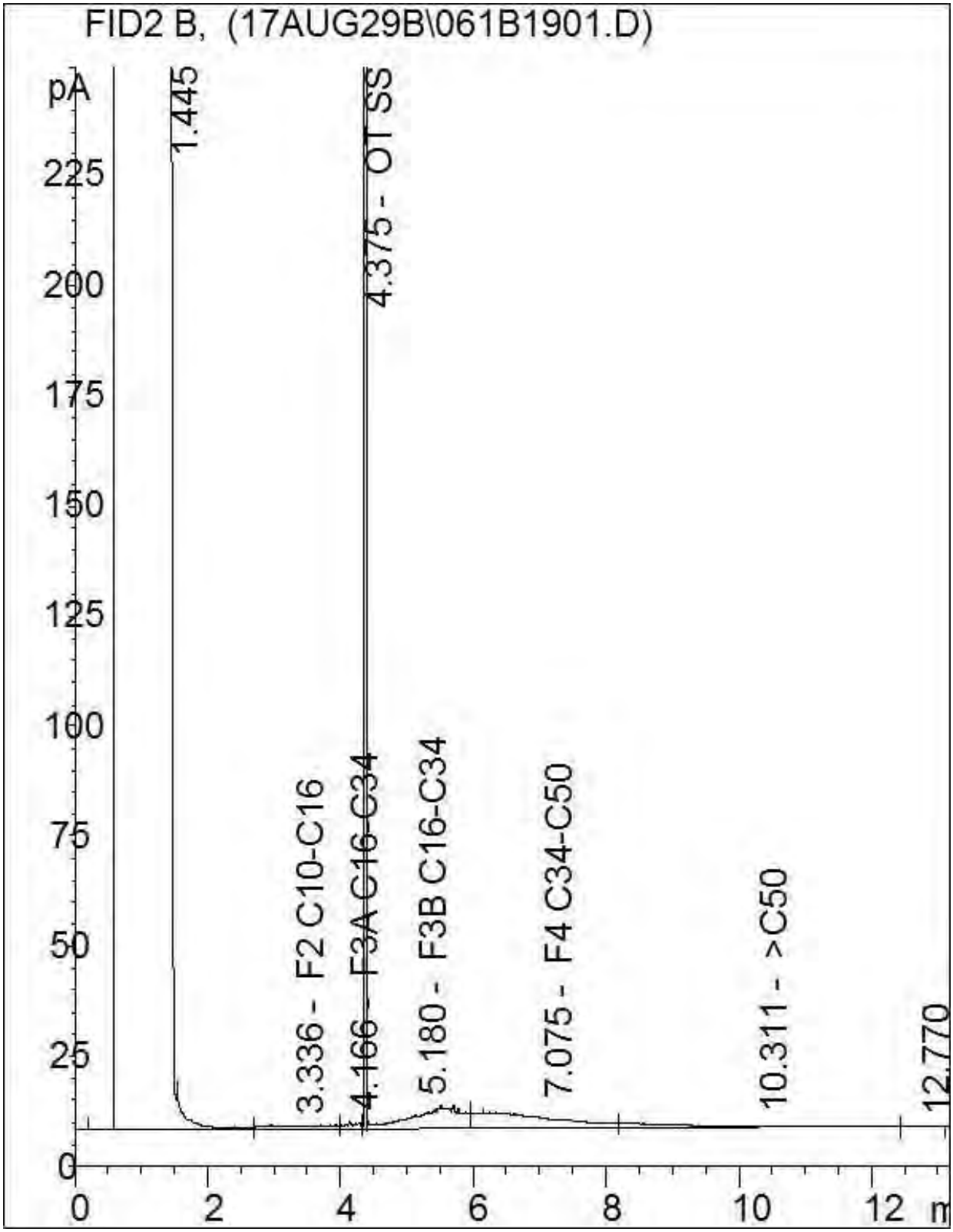
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

Maxxam Job #: B7I5566
Report Date: 2017/09/01
Maxxam Sample: FAB691

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: SP203-1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

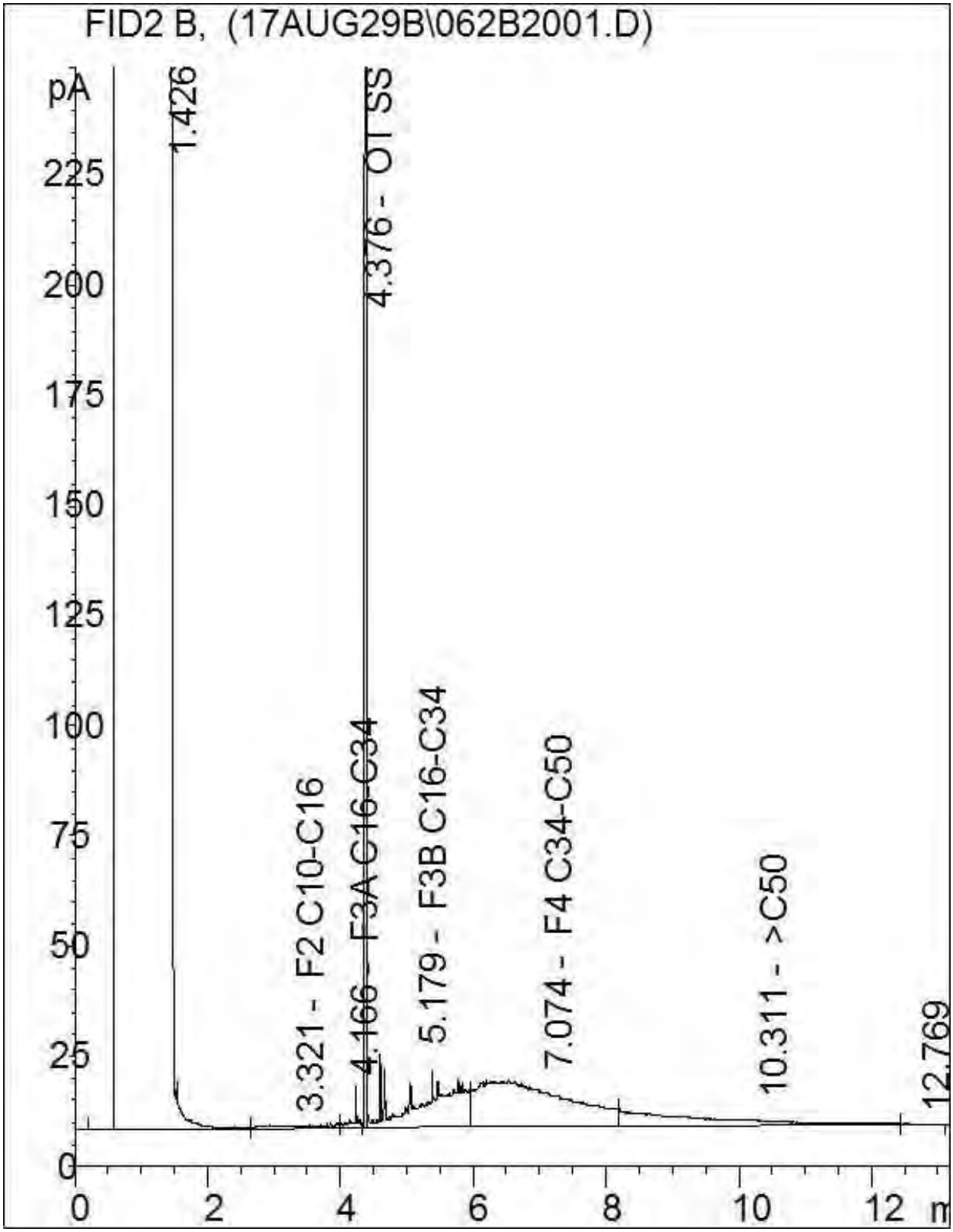


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7I5566
Report Date: 2017/09/01
Maxxam Sample: FAB692

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: SP203-2

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

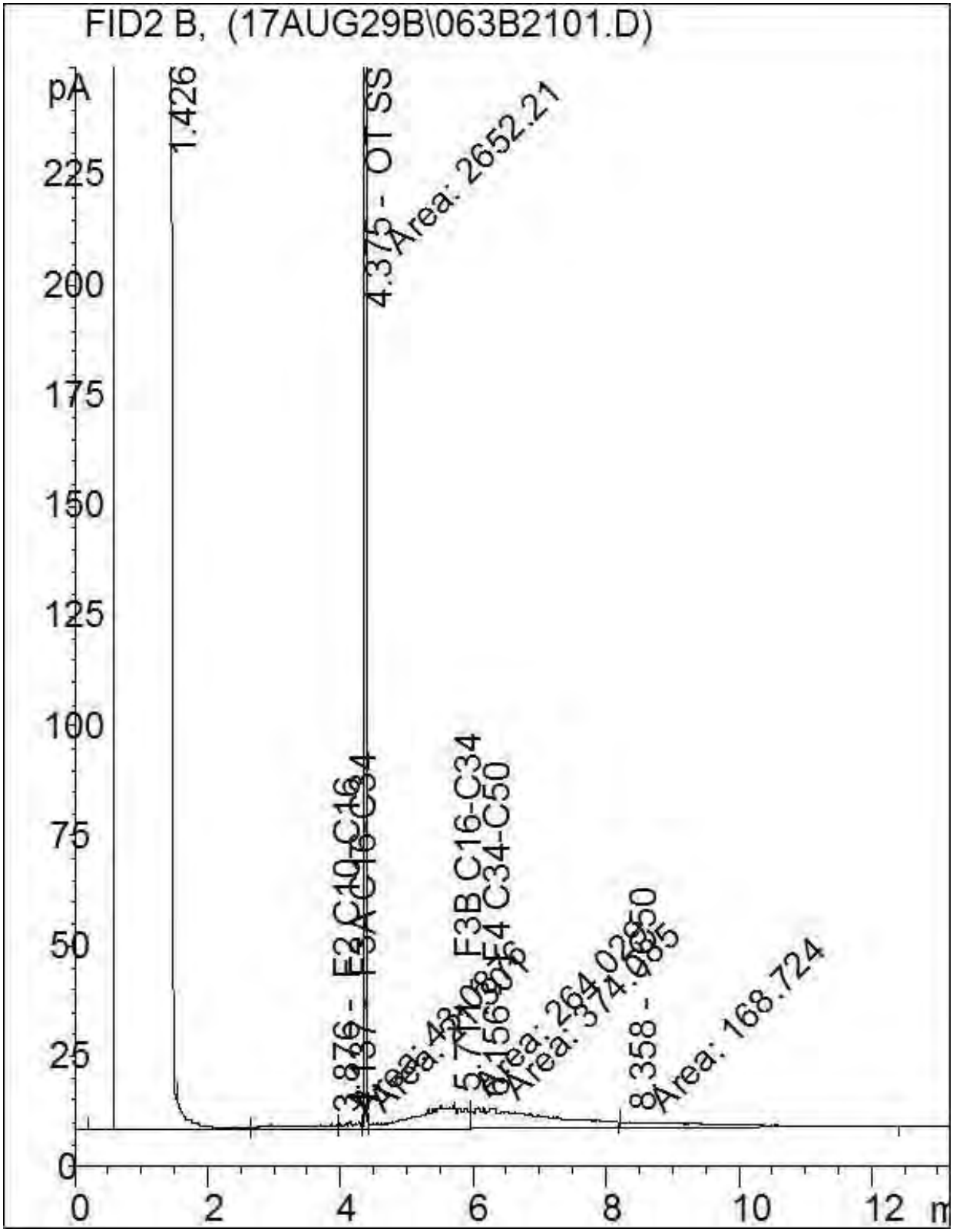


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B7I5566
Report Date: 2017/09/01
Maxxam Sample: FAB693

ARCADIS Canada Inc
Client Project #: 450271
Project name: TRIM ROAD
Client ID: DUP-7

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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

APPENDIX D

Waybills- Navan Landfill

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909138**	sshane

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 8:45 am	7/13/17 9:03 am	SWP002514		

REFERENCE	ORIGIN
102-13 SERGE	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 37,360 kg Scale In
TARE 14,470 kg Scale Out
NET 22,890 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
22.89	MT	Contaminated Soil HST# 866808298RT0004		$35.00	$ 104.15	$905.30

$905.30
$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

$0.00

CUSTOMER COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909138**	sshane

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 8:45 am	7/13/17 9:03 am	SWP002514		

REFERENCE	ORIGIN
102-13 SERGE	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 37,360 kg Scale In
TARE 14,470 kg Scale Out
NET 22,890 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
22.89	MT	Contaminated Soil HST# 866808298RT0004		$35.00	104.15	$ 905.30

$905.30
$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

$0.00

DISTRICT COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909169**	slanthier

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 9:55 am	7/13/17 10:06 am	SWP002514		

REFERENCE	ORIGIN
102-13 - Serge	OTTAWA CENTER

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 36,020 kg Scale In
TARE 14,470 kg Scale Out
NET 21,550 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
21.55	MT	Contaminated Soil		$35.00	$ 98.05	$852.30
		HST# 866808298RT0004				

$852.30
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

CUSTOMER COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909169**	slanthier

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 9:55 am	7/13/17 10:06 am	SWP002514		

REFERENCE	ORIGIN
102-13 - Serge	OTTAWA CENTER

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 36,020 kg Scale In
TARE 14,470 kg Scale Out
NET 21,550 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
21.55	MT	Contaminated Soil		$35.00	98.05	$ 852.30
		HST# 866808298RT0004				

$852.30
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

DISTRICT COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909199**	slanthier

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 10:55 am	7/13/17 11:18 am	SWP002514		

REFERENCE	ORIGIN
Serge	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 37,000 kg Scale In
TARE 14,520 kg Scale Out
NET 22,480 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
22.48	MT	Contaminated Soil HST# 866808298RT0004		$35.00	$ 102.28	$889.08

$889.08
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

CUSTOMER COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909199**	slanthier

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 10:55 am	7/13/17 11:18 am	SWP002514		

REFERENCE	ORIGIN
Serge	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 37,000 kg Scale In
TARE 14,520 kg Scale Out
NET 22,480 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
22.48	MT	Contaminated Soil HST# 866808298RT0004		$35.00	102.28	$ 889.08

$889.08
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

DISTRICT COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909241**	slanthier

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 12:20 pm	7/13/17 12:42 pm	SWP002514		

REFERENCE	ORIGIN
102-13 - Serge	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 39,060 kg Scale In
TARE 14,470 kg Scale Out
NET 24,590 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
24.59	MT	Contaminated Soil HST# 866808298RT0004		$35.00	$ 111.88	$972.53

$972.53
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

CUSTOMER COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909241**	slanthier

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 12:20 pm	7/13/17 12:42 pm	SWP002514		

REFERENCE	ORIGIN
102-13 - Serge	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 39,060 kg Scale In
TARE 14,470 kg Scale Out
NET 24,590 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
24.59	MT	Contaminated Soil HST# 866808298RT0004		$35.00	111.88	$ 972.53

$972.53
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

DISTRICT COPY

WASTE CONNECTIONS OF CANADA
OTTAWA LANDFILL
3354 NAVAN ROAD
OTTAWA, ON K4B 1H9
(613) 824-7289

SITE	TICKET #	OPERATOR
05	**909275**	jcheckowy

IN	OUT	TRUCK	CONT.	LICENCE
7/13/17 1:47 pm	7/13/17 1:57 pm	SWP002514		

REFERENCE	ORIGIN
102 13 SERGE	EAST END

010413
ARCADIS CANADA INC.
4005 HICKORY DRIVE
MISSISSAUGA, ON L4W 1L1

INVOICE
INBOUND

CONTRACT: SWP002514-1830 TRIM RD-OTTAWA-ARCADIS CANADA

GROSS 34,140 kg Scale In
TARE 14,480 kg Scale Out
NET 19,660 kg

ZONE: L/17-18NO/78
BOL:

QTY	UNIT	DESCRIPTION	TRACKING QTY	RATE	TAX	TOTAL
19.66	MT	Contaminated Soil HST# 866808298RT0004		$35.00	$ 89.45	$777.55

$777.55
$0.00

$0.00

I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

CUSTOMER COPY

APPENDIX K

Grain Size Curves

Grain Size Analysis Report

Client Sample ID: GRAIN 1 (GGD067)
Maxxam Sample ID: TC2480
Maxxam Job #: B818821

Tot. Sample Wt (g)*: 7.95
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8934791
Batch # (Hydro): 8937733

Analysis Date (Sieve): 2018/03/15
Analysis Date (Hydro): 2018/03/18

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	99.9
	Sieve 100	0.150	99.9
	Sieve 200	0.075	99.9
Hydrometer	R1min	0.0421	90.6
	R3min	0.0243	86.9
	R10min	0.0133	85.7
	R30min	0.0081	64.9
	R90min	0.0048	56.3
	R270min	0.0029	49.0
	R1080min	0.0015	22.0

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	7.2
Silt	0.002	0.050	61.1
Clay	-	0.002	31.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

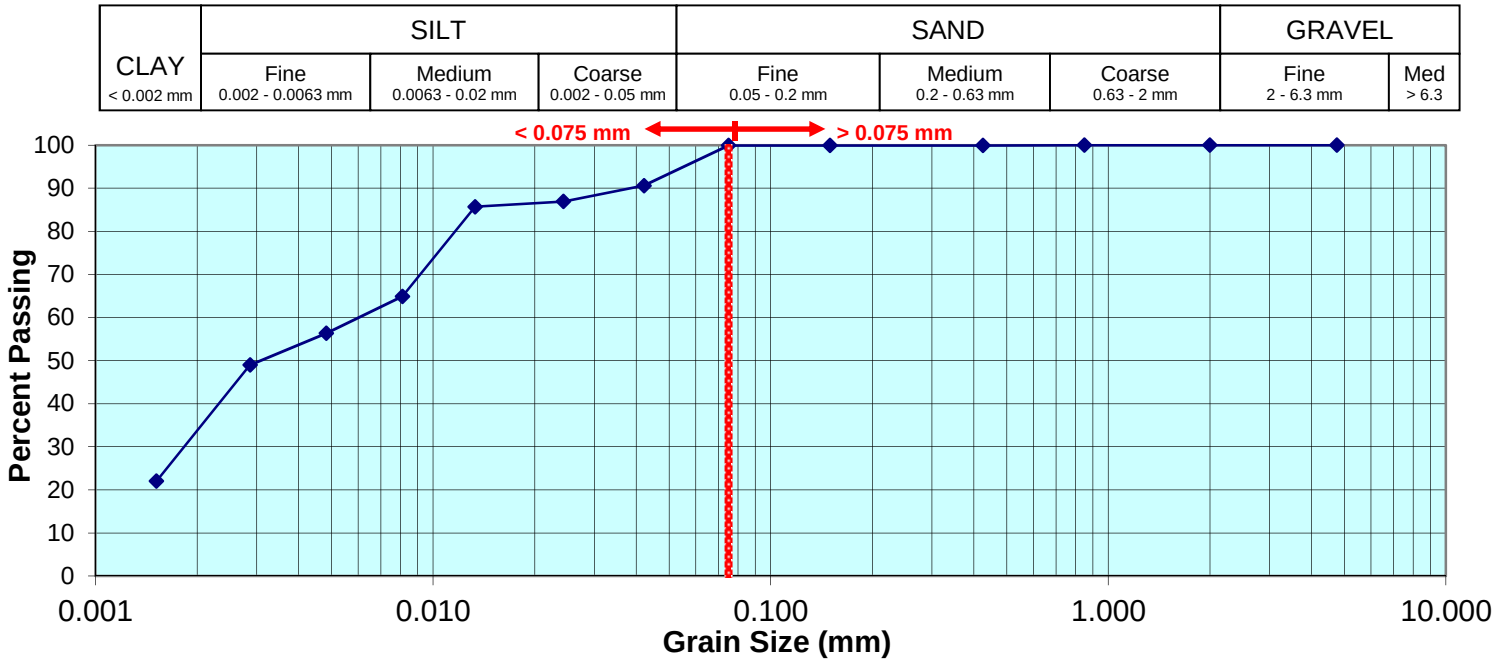
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.9
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.9
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: GRAIN 2 (GGD068)
Maxxam Sample ID: TC2481
Maxxam Job #: B818821

Tot. Sample Wt (g)*: 7.08
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8934791
Batch # (Hydro): 8937733

Analysis Date (Sieve): 2018/03/15
Analysis Date (Hydro): 2018/03/18

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	99.9
	Sieve 200	0.075	99.8
Hydrometer	R1min	0.0421	95.0
	R3min	0.0243	92.6
	R10min	0.0133	90.3
	R30min	0.0078	73.6
	R90min	0.0047	64.1
	R270min	0.0028	54.6
	R1080min	0.0015	26.1

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	3.8
Silt	0.002	0.050	59.1
Clay	-	0.002	37.1

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

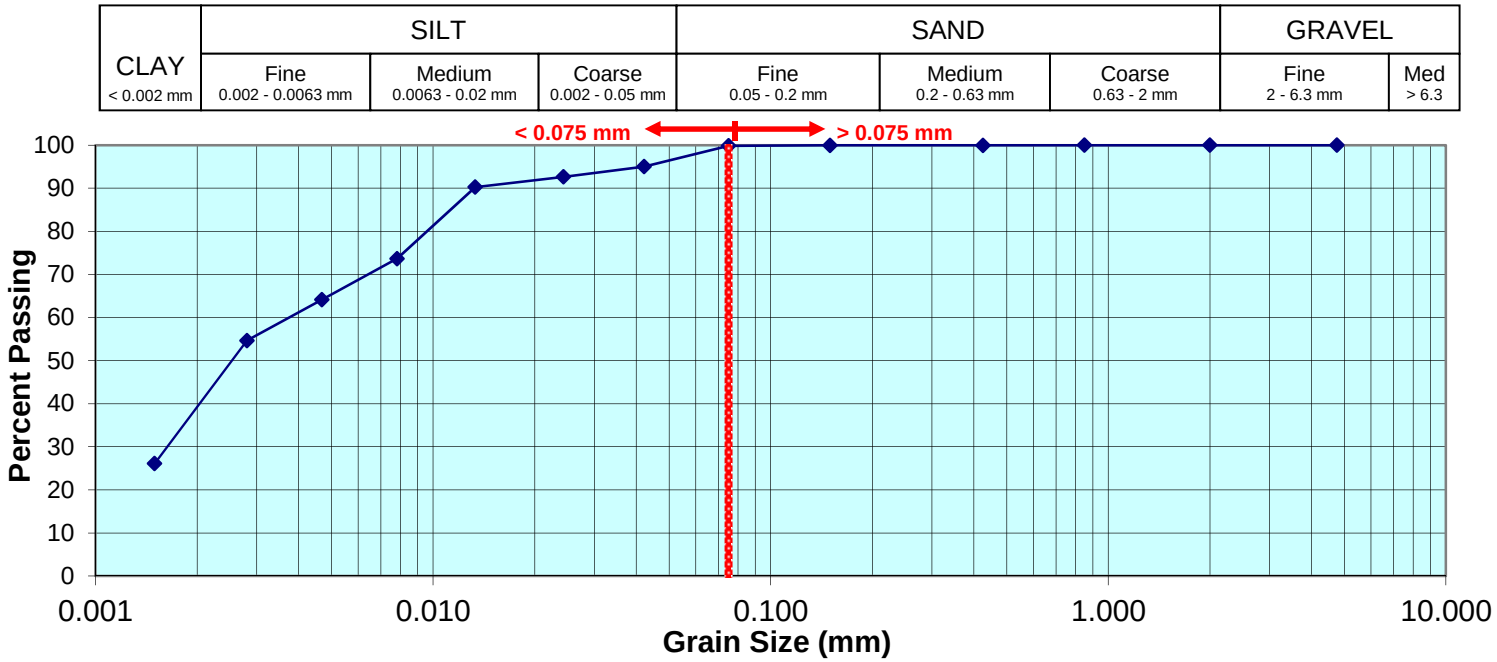
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: GRAIN 3 (GGD069)
Maxxam Sample ID: TC2482
Maxxam Job #: B818821

Tot. Sample Wt (g)*: 7.68
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 8934791
Batch # (Hydro): 8937733

Analysis Date (Sieve): 2018/03/15
Analysis Date (Hydro): 2018/03/18

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	99.9
	Sieve 200	0.075	99.8
Hydrometer	R1min	0.0421	91.9
	R3min	0.0243	87.1
	R10min	0.0133	87.1
	R30min	0.0081	65.3
	R90min	0.0048	58.1
	R270min	0.0029	48.4
	R1080min	0.0015	24.2

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	6.2
Silt	0.002	0.050	60.8
Clay	-	0.002	33.0

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

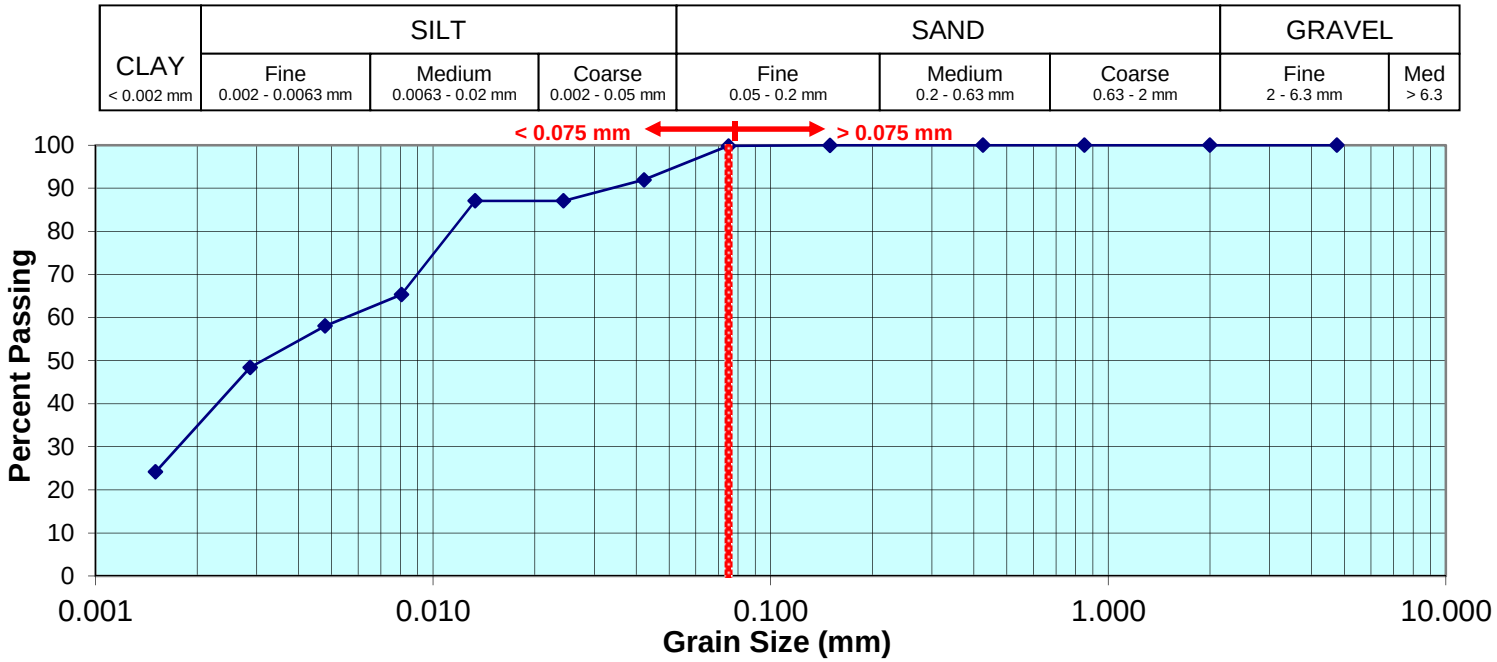
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report (QA-SRM)

Sieve Batch #: 8934791
Hydrometer Batch #: 8937733

Standard Reference Material

			Acceptance Limits	
	Fraction	% Recovery	Minimum	Maximum
Sieve	> 0.075 mm	97	75	125
	< 0.075 mm	102	75	125
Hydrometer	Sand	105	81	119
	Silt	-	0	0
	Clay	-	0	0

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: MB697905
Site Location: 450271000

Attention:SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2016/05/25
Report #: R2185733
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B637938
Received: 2016/05/17, 08:38

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Texture by Hydrometer	3	N/A	2016/05/19	AB SOP-00035 / AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	3	N/A	2016/05/19	AB SOP-00030	Auto Calc

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Joyce Kimani, Project Manager Assistant
Email: JKimani@maxxam.ca
Phone# (403)735-2287
==========
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		OQ4621	OQ4622	OQ4623		
Sampling Date		2016/05/12 11:00	2016/05/12 11:30	2016/05/12 13:15		
	UNITS	**G.S-1 (CIZ110-01)**	**G.S-2 (CIZ116-01)**	**G.S-3 (CIZ124-01)**	**RDL**	**QC Batch**
Physical Properties						
% sand by hydrometer	%	7.6	27	12	2.0	8274110
% silt by hydrometer	%	16	22	17	2.0	8274110
Clay Content	%	76	51	71	2.0	8274110
Texture	N/A	HEAVY CLAY	CLAY	HEAVY CLAY	N/A	8271873

RDL = Reportable Detection Limit
N/A = Not Applicable

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Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: OQ4621
Sample ID: G.S-1 (CIZ110-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam ID: OQ4622
Sample ID: G.S-2 (CIZ116-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

Maxxam ID: OQ4623
Sample ID: G.S-3 (CIZ124-01)
Matrix: Soil

Collected: 2016/05/12
Shipped: 2016/05/23
Received: 2016/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer	HY	8274110	N/A	2016/05/19	Bipin Lamichhane
Texture Class	CALC	8271873	N/A	2016/05/19	Automated Statchk

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Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

GENERAL COMMENTS

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

Package 1	0.7°C

Results relate only to the items tested.

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Maxxam Job #: B637938
Report Date: 2016/05/25

QUALITY ASSURANCE REPORT

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

			RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
8274110	% sand by hydrometer	2016/05/19	NC	35	104	93 - 107
8274110	% silt by hydrometer	2016/05/19	1.0	35	92	90 - 110
8274110	Clay Content	2016/05/19	1.4	35	103	86 - 114

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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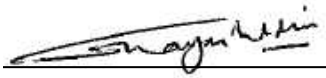
Maxxam Job #: B637938
Report Date: 2016/05/25

MAXXAM ANALYTICS
Client Project #: MB697905
Site Location: 450271000
Sampler Initials: SH

VALIDATION SIGNATURE PAGE

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



Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

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MAXXAM ANALYTICS
6740 Campobello Road
Mississauga, Ontario, L5N 2L8
(905) 817-5700
(905) 817-5777

541

ARCADIS Canada Inc - Ottawa
Maxxam PM Parnian Baber

SUBCONTRACTING REQUEST FORM

To: Campo to Calgary Subcontract

Job# B697905

☐ Yes ☒ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Sample ID	Matrix	Test(s) Required	Container	Date Sampled	Date Required
CIZ110-01R\G.S.-1	S	Soil Texture (% sand, %silt, %clay)	1-INOT	2016/05/12 11:00	2016/05/25
CIZ116-01R\G.S.-2	S	Soil Texture (% sand, %silt, %clay)	1-INOT	2016/05/12 11:30	2016/05/25
CIZ124-01R\G.S.-3	S	Soil Texture (% sand, %silt, %clay)	1-INOT	2016/05/12 13:15	2016/05/25

	Temp. 1	Temp. 2	Temp. 3			
Cooler #1	1	1	0	Custody Seal Present	~~YES~~ ✓	NO
				Custody Seal Intact	~~YES~~ ✓	NO
				Ice Present Upon Receipt	~~YES~~ ✓	NO
Cooler #2				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #3				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO

Receiving Maxxam Location: Campo to Calgary Subcontract JOB # _____

Relinquished by (Sign) _____ (print) MUSROP NOR Date and Time 2016/05/16 14:30

Received by (Sign) _____ (print) WINDCHONG (ZW) Date and Time 2016/05/17 08:35

NOTES:

1) Please call us if due date cannot be met. Please reference Sample ID on your report.
2) Include copy of this completed form, Client COC & signed final report to **scontractor@maxxamanalytics.com**

Reporting Requirements:

National:

Regional:

B637938_COC

17-May-16 08:38
Joyce Kimani
B637938

JKU INS-0114

Shipping Instructions

☐ Ship Immediately (highlight Yellow)
☐ Requires 9am
☐ Requires Sat. Delivery
☐ Regular Ship next available day
☐ Ship Cold
☐ Ship Room Temp
☐ Ship Frozen
☐ COC Must be Attached

Sender (Print) _____ Initial _____

Shipping Department Checklist

☐ Correct Shipping location
☐ Correct Sample Ids (Paperwork vs Bottles)
☐ Yes ☐ No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____ Number of coolers _____
Shipper (Print) _____ Initial _____

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