FINAL REPORT

Phase Two Environmental Site Assessment

665 Albert Street, Ottawa, Ontario

Submitted to:

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Submitted by:

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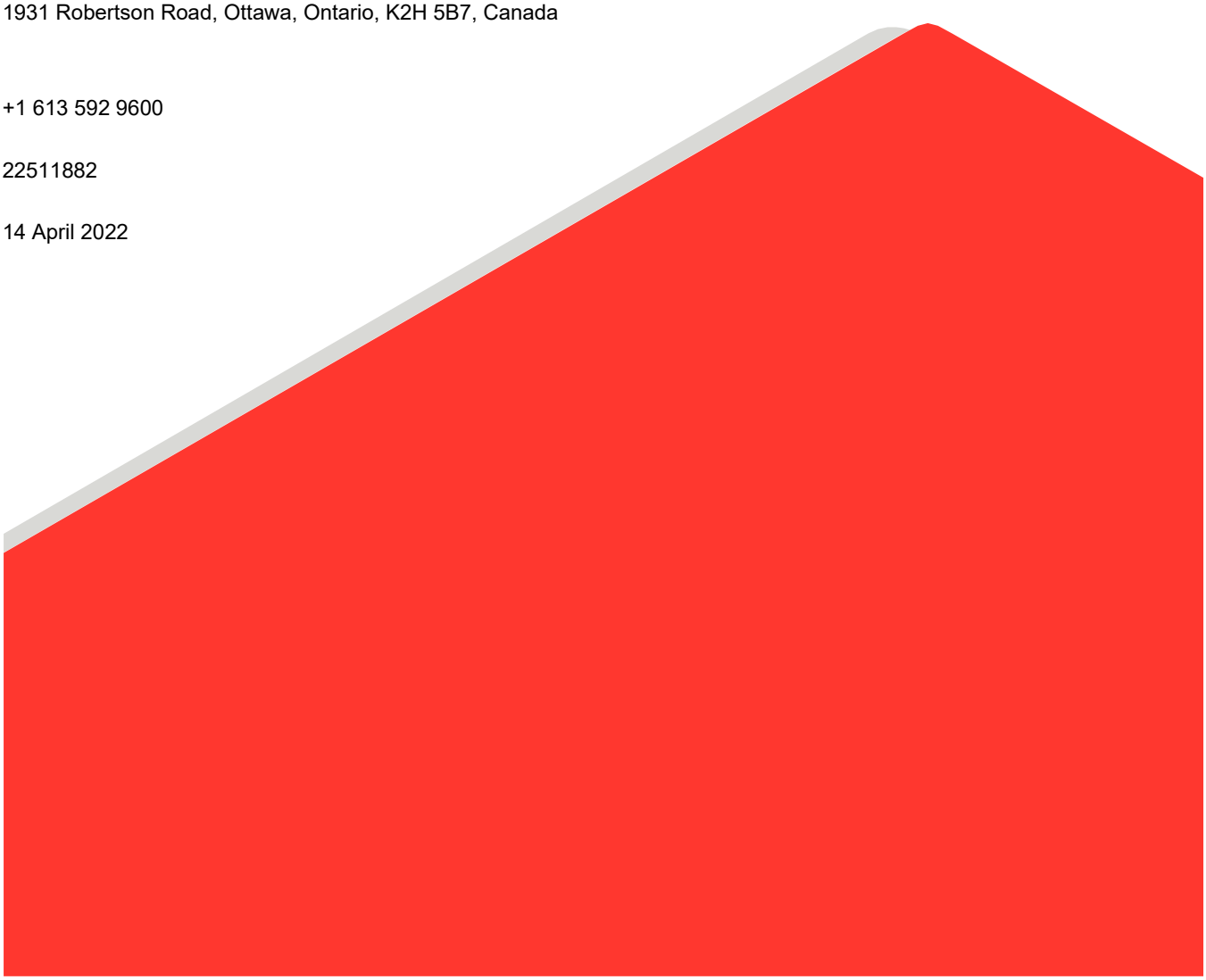
14 April 2022



Distribution List

1 e-copy Dream Impact Master LP

1 e-copy Golder Associates Ltd.

Executive Summary

Golder Associates Ltd. (Golder) was retained by Dream Impact Master LP (Dream) to conduct a Phase Two Environmental Site Assessment (“Phase Two ESA”) of the property referred to as 665 Albert Street, located north of Albert Street, east of Booth Street, south of the Fleet Street Aqueduct (open aqueduct), and west of the site of the future Ottawa Public Library – Library and Archives Canada Joint Facility in Ottawa, Ontario (the “Phase Two Property”).

Golder previously completed a Phase One ESA for the Site, the results of which are included in the Phase One ESA Report entitled Phase One ESA 665 Albert Street, Ottawa, Ontario, dated March 2022. Additionally Golder has relied on a previous Phase Two ESA completed on the Phase Two Property, entitled Supplemental Phase II ESA LeBreton Flats Blocks, B1, B2, C1, C2, E1, E2, E3, G, H1, H2, Ottawa, Ontario, dated February 2012. The findings of the 2012 Phase Two ESA have been integrated into this report. The Phase One ESA identified 5 APEC to investigate on the Phase Two Property which included the completion of 5 boreholes in 2022 and 6 boreholes as part of the 2012 Supplemental Phase II ESA.

Upon completion of the Phase Two ESA, discussed herein, it was identified that one of the APECs (site wide poor-quality fill) has resulted in the presence of approximately 2 metres of fill containing exceedances of the MECP Table 3 Site condition standards for residential land use. None of the APECs has resulted in groundwater impacts above the site condition standard.

The Phase Two Property is currently a vacant parcel of land that was previously used in part for an industrial use. As such, the proposed development, which includes two multi story residential towers will require remediation and/or risk assessment to address the identified impacts in fill in order to obtain a Record of Site Condition.

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1.0 INTRODUCTION

1.1 Site Description

Golder Associates Ltd. (Golder) was retained by Dream Impact Master LP “Dream”) to conduct a Phase Two ESA of the following property:

Information	Description
Address	Part 665 Albert Street, Ottawa, Ontario
Size	1.11 Hectares
Property Identification Number	All of PIN 04112-0242(LT)
Legal Description	PART OF WELLINGTON STREET (CLOSED BY BY-LAW INST. NO. LT1243128), PLAN NO. 2, BEING PARTS 1 TO 4, ON PLAN 4R-32303; PART OF WELLINGTON STREET, CLOSED BY LT1243128 & OC1457912, PLAN NO. 2, BEING PARTS 11 TO 17, PLAN 4R-32006; SUBJECT TO AN EASEMENT IN GROSS OVER PARTS 15 & 16 4R32006 AND PART 3 4R32303 AS IN OC2376918; CITY OF OTTAWA
Property Identification Number	All of PIN 04112-0244(LT)
Legal Description	PART LLOYD STREET, PLAN NO. 2, BEING PART 9, PLAN 4R-32006; S/T LT1243142; CITY OF OTTAWA
Property Identification Number	All of PIN 04112-0250(LT)
Legal Description	PARTS OF LOTS 6 & 7, PART OF THE WATER WORKS RESERVE, PART ALLEY CLOSED BY BY-LAW LT1243120 PLAN 9481, BEING PART 2 ON 4R-32006; CITY OF OTTAWA
Property Identification Number	All of PIN 04112-0251(LT)
Legal Description	LOTS 1, 2, 3, 4, 5, 6, 7 & 8 PLAN 9481, WATER WORKS RESERVE ON PLAN 9481, ALLEY ON PLAN 9481 (CLOSED BY BY-LAW LT1243120), EXCEPT PART 40 PLAN 5R13914, PART 10 PLAN 4R23452, PART 1 4R30019, PARTS 20, 21, 22, 25 & 41 ON 4R32151 AND PARTS 2, 23 & 25 ON 4R32006; SUBJECT TO AN EASEMENT IN GROSS OVER PARTS 3, 24 & 26 ON 4R32006 AND PARTS 23, 26, 27, 29, 37, 38 & 42 ON 4R32151 AS IN OC2177774; SUBJECT TO AN EASEMENT IN GROSS OVER PART LOTS 1, 2 & 3 PLAN 9481, PART 5, 4R32006 AND PARTS 27 & 28, 4R32151 AS IN OC2376919; CITY OF OTTAWA
Property Identification Number	Part of PIN 04112-0263(LT)
Legal Description	Final description to be updated at closing pending registration of new reference plan

The location of the Phase Two Property is provided in Figure 1. The boundaries of the Phase Two Property are the same as the RSC Property Boundaries and are provided in Figure 2.

1.2 Property Ownership

The Phase Two Property is owned by Dream Impacted Master LP, the contact information for the owner is below:

Owner / Client	Address	Contact Information
Client: Dream Impact Master LP	30 Adelaide Street East, Suite 301 Toronto, Ontario M5C 3H1	Mr. David Zamperin Office: (647) 535-6448 Email: dzamperin@dream.ca

1.3 Current and Proposed Future Uses

The Phase Two Property is currently a developed vacant lot whose last developed use included industrial use (wood and paper products manufacturing), commercial use (possible dry cleaner) and residential and institutional uses. The proposed future use of the Phase Two Property is primarily residential which may include some ground level commercial uses.

1.4 Applicable Site Condition Standard

The analytical results of the samples collected for this Phase Two ESA were compared to the Table 3 generic site condition standards (residential property use, coarse soil texture) presented in the MECP document "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", dated April 15, 2011. The applicable site condition standards were selected based on the following rationale:

- The Phase Two Property and all other properties located, in whole or in part, within 250 metres of the Phase Two Property are supplied by the City of Ottawa municipal drinking water system. No wells were identified that are used or intended for use as a source of water;
- The Phase Two Property is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water;
- Golder notified the City of Ottawa of the intent to use non-potable standards on March 10, 2022 and did not receive a notice of objection from the City within 30 days;
- Based on field observations and the grain size, the fill and native soil materials are considered coarse textured.
- The closest water body is the Ottawa River 250 metres to the northeast of the Phase Two Property. An aqueduct is located 20-30 metres north of the Phase Two Property; however, it is considered a constructed stormwater feature designed to control and direct surface water drainage and is not a waterbody under the Regulation;
- There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site, as described in Section 41of Ontario Regulation 153/04;
- The pH of the sub-surface soil meets the requirement that 5≤pH≤11, noting that all surface soil will be removed from the Site for redevelopment and remediation;
- The intended use for the Phase Two Property is mixed residential and commercial; and
- The overburden thickness and depth to groundwater is greater than 2 metres over more than one-third of the Phase Two Property.

2.0 BACKGROUND INFORMATION

This section presents the background conditions of the Phase Two Property including a description of the physical setting and a summary of past investigations conducted.

The objectives of the Phase Two ESA were to obtain information about environmental conditions in the soil and groundwater on, in or under the Site, and to develop the information necessary to complete a Record of Site Condition ("RSC") for the property. The objectives of this Phase Two ESA were achieved by:

- Developing an understanding of the geological and hydrogeological conditions at the Phase Two Property; and,
- Conducting field sampling for all contaminants of concern ("COCs") associated with each area of potential environmental concern ("APEC") identified in the Phase One ESA.

2.1 Physical Setting

The nearest surface water body is the Ottawa River, located 250 metres northeast of the Phase Two Property. There is an open aqueduct 20-30 m north of the Phase Two Property but this is not considered a waterbody as it is a constructed feature to control surface water flow and drainage. There are no areas of natural significance within the Phase One Study area. Land uses surrounding the Phase Two Property include vacant land, transportation corridors, institutional and residential, as shown in Figure 2.

The topography of the Phase Two Property and surrounding areas is generally flat up to the northern limit where the site drops down to the Ottawa Light Rail Transit (LRT) and aqueduct north of the Phase Two Property. There are no surface water drainage features on the Site. Booth Street becomes elevated behind a retaining wall at the west property boundary as it approaches a bridge abutment before crossing over the LRT.

2.2 Past Investigations

2.2.1 Phase One ESA

Golder conducted a Phase One ESA entitled, "*Phase One Environmental Site Assessment, 665 Albert, Street Ottawa, Ontario*", dated March 2022, to assess the likelihood of soil and/or groundwater contamination resulting from historic or present activities at the Site and surrounding area. This included a review of available historical information on the Site and surrounding area, interviews with persons familiar with the Site and a Site reconnaissance.

The APECs identified in the 2022 Phase One ESA are summarized in the following table:

Area of Potential Environmental Concern	Location of APEC	Potentially Contaminating Activity2	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1 – Fill Material of Unknown Quality	Entire Phase One Property	#30. Importation of Fill Material of Unknown Quality	On-Site	BTEX, PHC, metals, and PAHs	Soil
APEC 2 – Possible operation of dry cleaning equipment at Chinese Laundry noted in FIPs	Southwester portion of Phase One Property.	#37 Operation of Dry Cleaning Equipment (where chemicals are used)	On-Site	VOCs	Soil and Groundwater
APEC 3 – The Continental Paper Products Company Limited	Northwestern portion of Phase One Property	#45 Pulp, Paper and Paperboard Manufacturing and Processing	On-Site	BTEX, PHC, metals	Soil and Groundwater
APEC 4 – Capital Coach Lines / Tapp's Garage operated with three USTs	Approximately 25 m northeast of the Phase One Property	#10 Commercial Autobody Shops, #28 Gasoline and Associated Products Storage in Fixed Tanks, and #52 Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-Site	BTEX, PHC	Soil and Groundwater
APEC 5 - Oiling and greasing station	Approximately 40 m south of the Phase One Property	#10 Commercial Autobody Shops	Off-Site	BTEX, PHC	Soil and Groundwater

2.2.2 2012 Supplemental Phase II ESA, LeBreton South

- The purpose of this report was to document the investigation of three parcels of land, one of which (B1 and B2), includes the Phase Two Property. The B1 and B2 area investigated in 2012 is described as the area bordered to the north by the future light rail transit alignment (prior to the construction of the LRT), to the east by the former transitway, to the south by Albert Street and to the west by Booth Street.
- The investigation included the analysis of soil samples taken from 36 boreholes, 6 of which are on the Phase Two Property. Samples were tested for PAHs, select metals, PHCs, and BTEX. These boreholes are known as boreholes 11-33, 11-35, 11-37, 11-38, 11-39 and 11-40. In total the 2012 Phase II ESA included the analysis of 17 soil samples.
- The investigation revealed that the subsurface materials in the investigated area can be divided into two distinct layers:
  - A fill layer containing debris such as brick, mortar, slag, wood, ash and ceramic, between 2 and 3 metres thick in the west part of the Phase Two Property.
  - And a sandy fill or reworked native soils with no significant debris extending up to 3 metres in thickness overlying sand and gravel to silty sand and gravel glacial till.

- The upper two metres (approximately) was found to contain elevated concentrations of metals (mostly lead) at four locations, PAHs at three locations, and some PHCs (fraction F3) at one location above the MECP Table 3 Standards for residential land use.
- Soil underlying the upper two metres consists mostly of sand and gravel soils (glacial till) which did not contain any exceedances.
- It is noted that the Site has undergone changes to the topography since the 2012 investigation and some of the depth presented in the 2012 Supplemental Phase II ESA may not reflect the current elevation of the Site.

This report was prepared by the Qualified Person and will be relied upon for the Phase Two investigation.

3.0 SCOPE OF THE INVESTIGATION

3.1 Overview of Site Investigation

The Phase Two ESA investigation activities were completed between February 14, 2022 and February 25, 2022 and included the following tasks:

- **Health and Safety Plan**: Preparation of a Health and Safety Plan for internal and subcontractor use prior to initiating any field work at the Site.
- **Utility Clearances**: Coordination of utility clearances with local utility companies along with retaining the services of a private locator to assess for possible services in the areas of the proposed test locations.
- **Borehole Advancement and Monitoring Well Installation**: The borehole drilling and monitoring well installation program included drilling of five boreholes, each completed as groundwater monitoring wells, all of which were used for groundwater sampling at the Site. The rationale for the selected location of the boreholes is provided in the Sampling and Analysis Plan.). The location of the boreholes and monitoring wells are provided in Figure 3. The monitoring well construction details are presented in Table 1.
- **Soil Sampling**: Selected soil samples were collected between February 14, 2022 and February 24, 2022 from the boreholes. Soil samples were submitted for chemical analysis of one or more of the following: petroleum hydrocarbons (“PHCs”), volatile organic compounds (“VOCs”), polycyclic aromatic hydrocarbons (“PAHs”), metals, hydride-forming metals, and/or other regulated parameters.
- **Groundwater Monitoring and Sampling**: Groundwater samples were collected on February 25, 2022. Groundwater samples were submitted for analysis of one or more of the following: PHCs, VOCs, metals, hydride-forming metals, and/or other regulated parameters.
- **Surveying**: An elevation survey for the boreholes and monitoring wells was completed on March 4, 2022
- **Reporting**: Golder compiled and assessed the field and laboratory results from the above noted activities into this report.

The Phase Two investigation was carried out in general accordance with Golder’s standard operating procedures, which conform to the requirements of O. Reg. 153/04. The data from the Phase Two ESA investigation completed by Golder at the Site were incorporated into a single Phase Two ESA report following the Phase Two ESA report format required by O. Reg. 153/04.

There were no impediments or access limitations that would affect the conclusions of this Phase Two ESA report.

3.2 Media Investigated

To address the potential environmental issues identified in the Phase One ESA, the Phase Two ESA field program included sampling of subsurface soil and of groundwater from wells screened within the overburden and bedrock at the Site. No sediment was present at the Site and therefore no sediment sampling was completed. A summary of media investigated, and the applicable contaminants of potential concern are provided in Tables 3 and 4. The sampling and analysis plan outlines the rationale for the field investigation activities carried out at the Site and the associated methodologies used to meet the objectives of this Phase Two ESA.

3.3 Phase One Conceptual Site Model

The following describes the Phase One ESA CSM based on the information obtained and reviewed as part of this Phase One ESA:

- The Phase One Property consists of two parcels of land that are 2.74 acres (1.11 hectares) in area. No buildings were present, noting that the Pimisi Station and LRT line cross the Phase One Property currently, however, are not expected to be transferred to Dream and thus are considered off-site;
- The nearest body of water to the Phase One Property is the Fleet Street Aqueduct located approximately 20-30 m north. It is noted the Fleet Street aqueduct is not considered a surface water body, as defined in the regulation but a stormwater control feature. The Ottawa River, northeast of the Fleet Street Pump Station is the closest true waterbody. No areas of natural significance were identified on or within 250 m of the Phase One Property;
- Potable water in the vicinity of the Phase One Property is provided by the City of Ottawa and is obtained from the Ottawa River. No potable water wells were identified on the Phase One Property;
- At the time of the Phase One ESA, no roads ran through the Phase One Property; however, Wellington Street historically ran through the Phase One Property until it was moved prior to or during 2005. The pavement remained until 2015 at the latest.
- At the time of the Phase One ESA, the Phase One Property was undeveloped and unused. Historically, the Phase One Property has been used for residential, institutional, and commercial uses since 1878 and industrial purposes since prior to or during 1902. The Phase One Property may have been used for dry cleaning between 1902 and 1956.
- At the time of the Phase One ESA, the properties within the Phase One Study Area consisted of vacant lands as well as residential, institutional, and commercial land uses. There are no indications of a potentially contaminating activity or area of potential environmental concern in association with this use. Historically some properties in the Phase One Study Area were used for industrial uses and the following commercial uses: vehicle garage and dry cleaning facility;

- The following APECs and the associated contaminants of concern were identified:

Area of Potential Environmental Concern1	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity2	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern3	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1 – Fill Material of Unknown Quality	Entire Phase One Property	#30. Importation of Fill Material of Unknown Quality	On-Site	BTEX, PHC, metals, and PAHs	Soil
APEC 2 – Possible operation of dry cleaning equipment at Chinese Laundry noted in FIPs	Southwester portion of Phase One Property.	#37 Operation of Dry Cleaning Equipment (where chemicals are used)	On-Site	VOCs	Soil and Groundwater
APEC 3 – The Continental Paper Products Company Limited	Northwestern portion of Phase One Property	#45 Pulp, Paper and Paperboard Manufacturing and Processing	On-Site	BTEX, PHC, metals	Soil and Groundwater
APEC 4 – Capital Coach Lines / Tapp's Garage operated with three USTs	Approximately 25 m northeast of the Phase One Property	#10 Commercial Autobody Shops, #28 Gasoline and Associated Products Storage in Fixed Tanks, and #52 Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-Site	BTEX, PHC	Soil and Groundwater
APEC 5 - Oiling and greasing station	Approximately 40 m south of the Phase One Property	#10 Commercial Autobody Shops	Off-Site	BTEX, PHC	Soil and Groundwater

Notes:

1 Area of potential environmental concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one environmental site assessment, including through, •(a) identification of past or present uses on, in or under the phase one property, and •(b) identification of potentially contaminating activity

2 Potentially contaminating activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

3 Contaminants of potential concern specified using the method groups as identified in the "Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011

- Three underground utilities are known to be present at the Phase One Property: one sanitary utility, one storm utility, and one combination utility.
- Soil at the Phase One Property consists primarily of fill overlying glacial till to bedrock which is situated between 10-15 metres depth.
- Groundwater in the Phase One Study Area is anticipated to flow in a northerly direction towards the Fleet Street Aqueduct (20-30 m north).

There were no material deviations to the Phase One ESA requirements set out in O.Reg. 153/04 that would cause uncertainty or absence of information that would affect the validity of the Phase One Conceptual Site Model or the findings of this Phase One ESA.

3.4 Deviations from Sampling and Analysis Plan

A sampling and analysis plan was prepared which incorporates the 2022 investigation program. The sampling and analysis plan outlines the rationale for the field investigation activities carried out at the Site and the associated methodologies used to meet the objectives of this Phase Two ESA. The procedures described in the Sampling and Analysis Plan were generally followed with modifications as described below:

- Groundwater was not evident in the overburden at borehole 22-3 and as such the monitoring well was repositioned into the bedrock to span the water table and obtain a groundwater sample.

No further material deviations from the sampling and analysis plan were identified in the course of the investigation. The deviations from the Sampling and Analysis Plan helped to enhance the completeness of the site characterization.

3.5 Impediments

No physical impediments to the Phase Two ESA investigation were encountered. Access to the Phase Two Property was not denied or restricted.

4.0 INVESTIGATION METHOD

4.1 General

The following sections describe the field investigation methodology employed during the Phase Two ESA. The field work was conducted between February 14, 2022 and February 25, 2022.

Prior to initiating the field work, Golder developed and implemented Site-specific protocols to protect the health and safety of its employees and subcontractors through the preparation of a Site-specific Health and Safety Plan. An assessment of potential health and safety hazards at the Phase Two Property and those associated with the proposed work was completed each day of the field program. A health and safety tail gate meeting was held with Golder's subcontractors each day prior to completion of the field work. The document was reviewed and signed on-Site by field personnel prior to commencing work. Additionally, prior to any intrusive investigations, including drilling, Golder completed public and private utility clearances.

4.2 Drilling

Between February 14, 2022 and February 24, 2022, five boreholes (22-1 through 22-5) were advanced to depths of 12.2 to 16.4 metres below ground surface (“mbgs”), noting the depth of the boreholes, including bedrock coring at each hole was undertaken for geotechnical purposes which included additional drilling depth than which would have been required for the Phase Two ESA. Borehole locations are provided in Figure 3. A description of the quality assurance/quality control measures taken to minimize the potential for cross-contamination between sampling locations is provided in Section 5.12.

Boreholes were advanced by Dowing Drilling (“Dowing”) using a track mounted CCME 55 drill rig. During borehole drilling activities, overburden soil samples were collected using split spoon soil sampling equipment and augered using 108 mm outside diameter (“OD”) solid stem augers.

Soil samples were collected at 0.75 m intervals up to the water table then expanded to every 1.5 metres for geotechnical purposes. Sample collection was done using the following method:

- Split-spoon: 0.61 m (2 foot) long, 5.08 cm (2 inch) diameter stainless steel split spoon sampling system at 0.76 m long intervals. Split-spoons were decontaminated between sample locations.

4.3 Soil: Sampling

Soil samples were collected from undisturbed locations and split in the field into two components. One component was placed into laboratory-prepared container with minimal headspace and stored in a cooler for potential laboratory analysis. The second component was placed inside a plastic bag for field screening, consisting of the soil description, and noting the presence of any staining, odour and/or debris. A photoionization detector and combustible vapour detector calibrated to 100 parts per million (“ppm”) isobutylene and hexane was used to measure the total organic vapour and combustible vapour concentration in the headspace in the sealed plastic bag.

As per the sampling and analysis plan), at least one soil sample was submitted from each test location. Where the results of field screening indicated the presence of potentially impacted soil, an additional soil sample at greater depth was submitted for laboratory analysis to vertically delineate impacts.

One soil sample representing “worst-case” conditions at each sampling location was selected for laboratory analysis based on the field headspace screening measurements, visual observations (e.g., staining, discoloration and/or free product, if any), and olfactory observations (if any). Soil samples were submitted to the analytical laboratory under chain-of-custody procedures. A summary of the soil samples submitted for analysis is provided in Table 3.

Geologic descriptions, visual and olfactory observations, and results of field headspace measurements are presented on the Record of Borehole sheets in Appendix A(i).

4.4 Field Screening Measurements

Field measurements of sample headspace concentration were made using the following equipment:

Equipment	Parameters Detected	Detection Limit	Precision	Accuracy	Calibration Standard
RKI Eagle 2	Combustible gas	0-50,000 ppm	NA	±5%	Hexane (100 ppm)
RKI Eagle 2	Total organic vapour	0-2,000 ppm	NA	±5%	Isobutylene (100 ppm)

Instruments were calibrated daily, with daily calibration checks completed by Golder.

One soil sample representing “worst-case” conditions at each sampling location was selected for laboratory analysis based on the soil headspace screening measurements, visual observations (e.g., staining, discoloration and/or free product, if any), and olfactory observations (if any). The results of soil headspace screening measurements are provided in the Record of Boreholes in Appendix A(i).

4.5 Groundwater: Monitoring Well Installation

Groundwater monitoring wells were installed by Downing Drilling using threaded 32 mm diameter, schedule 40, polyvinyl chloride (“PVC”) well screens and riser pipe, which were brought to the Site in sealed plastic bags. The annular space was filled with silica filter sand to at least 0.3 m above the well screen. The monitoring well was sealed with bentonite from the top of the sand pack and completed with a stickup protective well casing set in concrete. A description of the quality assurance/quality control measures taken to minimize the potential for cross-contamination between sampling locations is provided in Section 5.12.

Following drilling, the monitoring wells were developed by removing up to ten well volumes, using dedicated Waterra® pumps (tubing with foot valves). During monitoring well development, qualitative observations were made of water colour, clarity, and the presence or absence of any hydrocarbon sheen or odours.

4.6 Groundwater: Field Measurements for Water Quality Parameters

Groundwater indicator parameters including temperature, pH and conductivity were measured prior to sampling to ensure adequate well development and purging.

4.7 Groundwater: Sampling

Each monitoring well was purged prior to sample collection. During purging, qualitative observations were made of water colour, clarity, and the presence of hydrocarbon sheen or odour. Purging was completed by pumping at least three well volumes Groundwater sampling was carried out on February 25, 2022.

Groundwater samples were placed in laboratory-prepared containers and stored in a cooler until delivery to the analytical laboratory under chain-of-custody procedures. A summary of the groundwater samples submitted for analysis is presented in Table 4.

4.8 Sediment: Sampling

No sediment samples were collected as part of this investigation.

4.9 Analytical Testing

The contact information for the analytical laboratory: Bureau Veritas, 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 (Katherine Szozda, 613-408-5043).

The analytical laboratory is accredited in accordance with the International Standard ISO/IEC 17025 (CALA) (General Requirement for the Competence of Testing and Calibration Laboratories, May 5, 2005, as amended) and the standards for proficiency testing developed by the Standards Council of Canada, the Canadian Association for Laboratory Accreditation or another accreditation body accepted by the MOE.

4.10 Residue Management Procedures

All residues produced during the investigation (e.g., soil cuttings from drilling, groundwater from well development purging, wash water from equipment decontamination) were placed in sealed drums and stored at the Phase Two Property for disposal by the owner.

4.11 Elevation Surveying

Surveying of the Phase Two Property was undertaken using a Trimble R8 GPS on March 4, 2022 to record geodetic ground surface and top of well pipe elevations at each of the five wells on the Site.

4.12 Quality Assurance and Quality Control Measures

Golder's quality assurance program for environmental investigations was implemented to ensure that analytical data obtained by the investigation were valid and representative. The quality assurance program included the following measures:

- The use of standard operating procedures for all field investigation activities;
- All monitoring wells were developed following installation to remove fine particles from the filter pack and any fluids introduced during drilling;
- Monitoring wells were appropriately purged prior to groundwater sample collection to remove stagnant water from the well bore and improve sample representativeness, minimizing sample agitation and aeration to the extent practicable;
- The collection of field duplicate samples at a minimum frequency of one duplicate for every ten samples;
- The collection of at least one trip blank for sampling events that include the analysis of volatile organic compounds in groundwater;
- Initial calibration of field equipment was performed at the start of each field day, with a daily checks of calibration, as needed, using a standard of known concentration;
- Soil and groundwater samples were handled and stored in accordance with the sample collection and preservation requirement of the MECP "*Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.I of the Environmental Protection Act*", July 1, 2011. Samples were collected directly into pre-cleaned, laboratory-supplied sample containers with the appropriate preservative for the analyte group. Upon collection, samples were placed in insulated coolers with ice for storage and transport to the analytical laboratory under chain-of-custody;

- Dedicated sampling equipment (tubing and footvalves) and clean disposable Nitrile™ gloves were used at each sampling location to prevent cross-contamination. All non-dedicated sampling equipment (e.g., water level meters, split spoons) was decontaminated between sampling locations. Sampling equipment in contact with soil, groundwater, or sediment was: cleaned by mechanical means; washed with a phosphate-free, laboratory-grade detergent (e.g., LiquiNox) and, if necessary, an appropriate desorbing wash solution; and thoroughly rinsed with analyte-free water;
- Detailed field records documenting the methods and circumstances of collection for each field sample were prepared at the time of sample collection. Each sample was assigned a unique sample identification number recorded in the field notes, along with the date and time of sample collection, the sample matrix, and the requested analyses; and,
- The submission of samples to the analytical laboratory in accordance with standard chain of custody procedures.

Below is a summary of the duplicate and trip blank samples collected during the Phase Two ESA.

Date	Media	Sample ID	Duplicate ID	Trip Blanks
February 22, 2022	Soil	BH 22-3 SA1	Dup-1	NA
February 25, 2022	Groundwater	BH 22-1	DUP	Trip Blank

5.0 REVIEW AND EVALUATION

This section of the report presents a review and evaluation of the results of the drilling, monitoring and sampling activities conducted as part of the Phase Two ESA.

5.1 Geology

The soil conditions encountered during the borehole drilling programs are presented in the Record of Borehole sheets provided in Appendix A(i), as well as in the cross-section presented in Figure 6. The following presents a summary of the subsurface soil conditions encountered during the investigation.

In general, the subsurface soil conditions encountered in the boreholes consisted of a silty sand and gravel fill of variable depths between 1.5 and 4.4 metres. This is followed by more silty sand and gravel with cobbles and boulders (possibly also fill) up until reaching glacial till (silty sand and gravel, cobbles and boulders) at depths of 3.8 and 6.1 metres. Bedrock was encountered at depths of between 11.2 and 14.7 metres.

Similar conditions were noted during the previous 2012 investigation with 2.1 and 3.0 metres of silty sand fill over glacial till being present.

Based on the soil conditions encountered in the boreholes, the glacial till is considered to be an unconfined aquifer connected with the upper weathered bedrock.

5.2 Groundwater: Elevations and Flow Direction

All monitoring wells were used in the interpretation of shallow groundwater contours and shallow groundwater flow direction. Any temporary fluctuation in water levels on the Phase Two Property is not anticipated to affect the conclusions of the Phase Two ESA.

The base of the five existing shallow groundwater monitoring well screen was installed at elevations ranging from approximately 47.2 to 53.24 masl (9.1 to 14.5 mbgs). The location and depth of the screens were selected based on the issues being investigated, and were installed to straddle the water table. A summary of the monitoring well construction details are presented in Table 1. Monitoring for free phase product was undertaken during well development and purging. No evidence of free product or sheen in groundwater was observed.

The elevations of the potentiometric surface at each monitoring well are summarized in Table 2. Groundwater elevations ranged from 49.38 and 55.92 masl (7.0 - 12.3 mbgs) on February 25, 2022. Based on the interpreted groundwater elevation contours presented in Figure 4, the inferred direction of groundwater flow is to the north-northeast.

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events, seasonal trends could not be identified; however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter.

Underground utility drawings available for the Phase Two Property indicated three sewer lines, with one deeper sewer present along the northern edge of the Site which may be influencing the groundwater. Furthermore, the LRT tunnel entrance and recently installed Combined Sewage Storge Tunnel (CSST) are located in close proximity to the Phase Two Property to the northeast and are expected to extend below the groundwater table. It is noted that no COCs are present in groundwater exceeding the applicable site condition standards.

5.3 Groundwater: Hydraulic Gradients

The average horizontal hydraulic gradient was estimated for shallow groundwater conditions based on water levels collected on February 25, 2022, and the inferred groundwater contours are presented in Figure 6. The horizontal hydraulic gradient for shallow groundwater conditions was between 0.10 and 0.16 m/m with a strong northerly direction. This is inferred to be the result of the change in topography and influence form the Ottawa River and utilities north of the Phase Two Property.

Vertical hydraulic gradients were not calculated as no COC were identified in groundwater exceeding the site condition standards and as such, no nested monitoring wells were installed at the Site.

5.4 Soil Texture

Based on field observations, more than 50% of particles (by mass) in the soil were equal to or greater than 75 µm in mean diameter. Accordingly, soil at the Phase Two Property is considered to be coarse-textured.

5.5 Soil: Field Screening

Headspace vapour measurements were conducted on the soil samples collected from all of the boreholes. Combustible and organic vapours were non-detect.

The results of headspace vapour measurements are presented on the field logs in Appendix A(i).

5.6 Soil: Quality

Table 3 provides a summary of the soil samples submitted for analysis and the associated test parameters. The analytical results of soil samples are presented in Tables 5A to 5C. Laboratory Certificates of Analysis for the soil samples are included in Appendix A(ii).

Golder completed soil sampling at the Site during borehole advancement between February 14 and February 24, 2022. The soil samples were submitted to Bureau Veritas for analysis of one or more of the following parameters: metals, inorganics, VOC, BTEX, PAH and/or PHC. The results of the 2012 Supplemental investigation have also been included.

A summary of the number of soil samples analyzed and the number of soil samples exceeding the Table 3 site condition standards is provided below:

Parameter	Number of soil samples analyzed	Number of soil samples exceeding the Table 3 Standards
2022 Phase Two ESA		
VOC	10	0
PAH	10	1
Metals	10	0
Electrical Conductivity/Sodium Adsorption Ratio	10	0*
pH	6	1*
PHC F1-F4/BTEX	10	0
2012 Supplemental Phase II ESA		
PHC F1-F4/BTEX	21	1
PAH	21	4
Metals	21	5

Notes: 5 samples exceeded the standard for EC/SAR, however, are present as a result of the application of salt for safety purposes and as such are not considered as being an exceedance. pH in 22-3 SA1 was above the surface soil pH standards but was below the subsurface pH standard, however, this soil will be removed for development and remediation.

Including the historical results, six locations exceeded the site conditions standards for at least one parameter. The exceedances were all limited to the upper 2 metres in the fill.

5.7 Groundwater: Quality

Monitoring well construction details are summarized in Table 1 and a list of groundwater samples submitted for laboratory analysis is provided in Table 4. The analytical results for groundwater samples are summarized in Tables 6A through 6C, along with the applicable Table 3 site condition standards. Laboratory certificates of analysis for groundwater are provided in Appendix A(ii).

Golder completed sampling of monitoring wells at the Site on February 25, 2022. A summary of the number of groundwater samples analyzed and number of samples exceeding the Table 3 site condition standards is provided below:

Parameter	Number of groundwater samples analyzed	Number of groundwater samples exceeding the 2011 Table 3 Standards
VOC	5	0*
Metals	5	0
PHC F1-F4/BTEX	5	0
PAH	5	0

Notes: * Chloroform exceeded the site condition standards at one location but was due to the presence of municipally treated drinking water and not considered to represent an exceedance.

All groundwater samples submitted for analysis met the applicable site condition standards with the exception of the reported concentration of chloroform in one sample. Due to the use of municipally treated water for bedrock coring and the proximity of sewer and watermains on the Site, in the opinion of the Qualified Person, groundwater at the Phase Two Property meets the applicable site condition standards.

In addition to the numerical standards, the MECP sets out aesthetic standards relating to the presence of petroleum hydrocarbon product. Specifically, a property does not meet the site condition standards if there is evidence of free product, including but not limited to, visible petroleum hydrocarbon film or sheen present on groundwater, surface water or in any groundwater or surface water samples. Monitoring for free phase product was conducted during groundwater sample collection. No evidence of free product or sheen in groundwater was observed.

5.8 Sediment: Quality

No sediment samples were collected as part of this investigation.

5.9 Data Quality Review

The quality assurance assessment of the field duplicate sample results was conducted according to the MECP document "*Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*", March 9, 2004 (amended in July 2009 and effective as of July 1, 2011) ("Analytical Protocol").

To determine the precision of the analytical methods and field sampling procedures, blind duplicate samples were collected during soil and groundwater sampling. Precision is determined by the relative percent difference ("RPD") between the duplicate and original samples and was calculated as follows:

$$RPD = \frac{|x_1 - x_2|}{x_m}$$

Where
x_1 initial sample results
x_2 duplicate sample results
x_m mean of x_1, x_2

The analytical results of the primary and duplicate soil and groundwater samples indicated a satisfactory correlation between the primary and duplicate samples; however, the soil duplicate results were outside the 30% recommended control limit in the Analytical Protocol. This is likely due to the concentrations in soil being within 10 times the detection limit and the heterogenous nature of fill from which the duplicate sample was taken

It is noted that the trip blank samples were found to have no detectable concentrations. The quality of the analytical results is further supported by analytical laboratory's internal quality assurance program that includes laboratory blanks, spikes, surrogates and duplicate samples.

All certificates of analysis or analytical reports received pursuant to clause 47 (2) (b) of the regulation comply with subsection 47(3). A certificate of analysis or analytical report has been received for each sample submitted for analysis and is provided in Appendix A(ii).

Accordingly, the analytical data generated during the investigation are valid and representative and may be used in this Phase Two ESA without further qualification.

5.10 Phase Two Conceptual Site Model

The Phase Two conceptual site model is presented in the following sections.

POTENTIAL SOURCES OF CONTAMINATION

Potentially Contaminating Activities

Based on the information obtained as part of the Phase One ESA, the following potentially contaminating activities ("PCAs") were identified which have resulted in an APEC to the Site. The location of each PCA is provided in Figure 2:

Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
#30 Importation of Fill Material of Unknown Quality.	ERIS Report, previous reports, and site observation.	The PCA is located on the Phase One Property and must be identified as an APEC.
#37 Operation of Dry Cleaning Equipment (where chemicals are used) – A Chinese Laundry that may have use dry cleaning equipment operated in the southwestern section of the Phase One Property.	FIPs.	The PCA is located on the Phase One Property and must be identified as an APEC.
#45 Pulp, Paper and Paperboard Manufacturing and Processing – The Continental Paper Products Company Limited operated in the northwestern section of the Phase One Property.	FIPs and HLUI.	The PCA is located on the Phase One Property and must be identified as an APEC.
#10 Commercial Autobody Shops, #28 Gasoline and Associated Products Storage in Fixed Tanks, and #52 Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems – Capital Coach Lines / Tapp's Garage operated with three USTs approximately 25 m northeast of the Phase One Property.	FIPs and HLUI.	Given its proximity to the Phase One Property, this PCA is considered to constitute an APEC.
#10 Commercial Autobody Shops – An oiling and greasing station operated approximately 40 m south of the Phase One Property.	FIPs and HLUI.	Based on the up-gradient location of this PCA with respect to the Phase One Property, it is considered to constitute an APEC.

Areas of Potential Environmental Concern

A summary of the APECs identified at the Phase One Property is provided in the following table. The location of each APEC is presented in Figure 4.

Area of Potential Environmental Concern	Location of APEC	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1 – Fill Material of Unknown Quality	Entire Phase One Property	#30. Importation of Fill Material of Unknown Quality	On-Site	BTEX, PHC, metals, and PAHs	Soil
APEC 2 – Possible operation of dry cleaning equipment at Chinese Laundry noted in FIPs	Southwester portion of Phase One Property.	#37 Operation of Dry Cleaning Equipment (where chemicals are used)	On-Site	VOCs	Soil and Groundwater
APEC 3 – The Continental Paper Products Company Limited	Northwestern portion of Phase One Property	#45 Pulp, Paper and Paperboard Manufacturing and Processing	On-Site	BTEX, PHC, metals	Soil and Groundwater
APEC 4 – Capital Coach Lines / Tapp's Garage operated with three USTs	Approximately 25 m northeast of the Phase One Property	#10 Commercial Autobody Shops, #28 Gasoline and Associated Products Storage in Fixed Tanks, and #52 Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-Site	BTEX, PHC	Soil and Groundwater
APEC 5 - Oiling and greasing station	Approximately 40 m south of the Phase One Property	#10 Commercial Autobody Shops	Off-Site	BTEX, PHC	Soil and Groundwater

APEC 1 – The investigation included the collection of one fill sample from each of the 2022 boreholes for PHC, PAH, metals, and VOC analysis. The 2012 Supplemental Phase Two ESA collected 2 samples per borehole from the fill totalling 12 samples. In total there were six sampling locations with exceedances of the MECP Table 3 Standards. The exceedances were mainly metals and PAHs, but there was one PHC exceedance. The Exceedances were distributed across the Phase Two ESA property and were limited to the upper 2 metres of the Phase Two Property. The deepest exceedances were found in the samples collected from 0.6-1.2 metres, delineated by clean samples taken at 2.4 to 3.0 metres. Impacts were found in the fill at 11-33, 11-35, 11-37, 11-38, and 11-40 and 22-2.

APEC 2 – Borehole 22-5 was drilled in the location of the former dry cleaner and included two soil samples, one shallow fill sample and one from the native soil near the groundwater table. Neither sample contained any VOC exceedances. Additionally, the other four boreholes completed in 2022 included VOC analysis in soil and did not identify any VOC exceedances.

APEC 3 – Borehole 22-4 was drilled in the location of the former paper products company and included two soil samples, one shallow fill sample and one from the native soil near the groundwater table. Neither sample identified any exceedance for any of the COCs. Additionally, none of the other boreholes identified any COC exceedances for samples taken in the native soil at the groundwater table where migration from the APEC may have occurred.

APEC 4 – Boreholes 22-3 and 11-40 were drilled in the northeast corner of the Phase Two ESA property, adjacent to the off-Site PCAs. 22-3 included two soil samples, one shallow fill sample and one from the native soil near the groundwater table and 11-40 included four samples, two from the fill and two from the native soil. None of these samples identified any exceedance for any of the COCs. Additionally, none of the other boreholes identified any COC exceedances for samples taken in the native soil at the groundwater table where migration from the APEC may have occurred.

APEC 5 – Boreholes 22-5 and 11-33 were drilled in the location southwest corner of the Phase Two Property, opposite the off-Site PCA. 22-5 included two soil samples, one shallow fill sample and one from the native soil near the groundwater table and 11-33 included four samples, two from the fill and two from the native soil. None of these samples identified any exceedance for any of the COCs (PHC/BTEX in this instance). Additionally, none of the other boreholes identified any PHC/BTEX exceedances for samples taken in the native soil at the groundwater table where migration from the APEC may have occurred.

Subsurface Structures and Utilities

Underground utility drawings available for the Phase Two Property indicated the presence of three sewer lines running along the former Wellington Street right of way which crosses the north of the Phase One Property, one of the sewers is known to be deep (below the groundwater table). Although the deeper utility may act as a preferential conduit for migration of groundwater, the Phase Two ESA did not identify any exceedances in groundwater. Given the absence of any exceedances in the groundwater and the relative position of the monitoring wells to the PCAs compared to the utilities (i.e., the monitoring wells were closer to and between the PCA and the utility), the migration of impacts along the utilities is not considered an issue.

PHYSICAL SETTING

Stratigraphy

A representative geologic cross-section of the Site is presented in Figure 5. In general, the subsurface soil conditions encountered in the boreholes consisted of a silty sand and gravel fill of variable depths between 1.5 and 4.4 metres. This is followed by more silty sand and gravel with cobbles and boulders (possibly also fill) until reaching glacial till (silty sand and gravel, cobbles and boulders) at depths of 3.8 and 6.1 metres.

Similar conditions were noted during the previous 2012 investigation with 2.1 and 3.0 metres of silty sand fill over glacial till being present.

Given that the average thickness of overburden at the Site is greater than 2 m, the Site is not considered to be a shallow soil property as defined by O.Reg. 153/04 (as amended).

Depth to Bedrock

Bedrock was encountered at depths of between 11.2 and 14.7 metres.

Hydrogeological Characteristics

The regional groundwater flow direction is expected to be towards the north-northeast controlled by the Ottawa River, Fleet Street Aqueduct, LRT tunnel and Combined Sewage Storage Tunnel, all located to the north and northeast of the Phase Two Property.

Static groundwater levels were measured in the monitoring wells located across the February 25, 2022. Figure 6 shows groundwater elevations and the interpreted groundwater flow direction. Groundwater elevations ranged from 55.92-49.38 masl (7.0-12.3 mbgs). The deeper of which is located closest to the deep off-Site infrastructure to the northeast of the Phase Two ESA Property with the shallowest water table located along the southern limit of the Phase Two Property.

The average horizontal hydraulic gradient was estimated for shallow groundwater conditions based on water levels collected on February 25, 2022. The horizontal hydraulic gradient for shallow groundwater conditions was between 0.1 and 0.16 m/m with a strong northerly direction. This is inferred to be the result of the change in topography and influence form the Ottawa River and utilities north and northeast of the Phase Two Property.

Depth to Groundwater

The depth to the water table ranged from 2.6 to 3.3 mbgs in February 2017, but more typically ranges from 3.2 to 3.6 mbgs (based on monitoring conducted in 2015 and 2016) which is within the native silty sand.

SITE CONDITION STANDARDS

Environmentally Sensitive Areas

An area of natural significance is not located within 30 meters of the Phase Two Property. Five soil samples were submitted for pH analysis. The reported pH of all samples met the requirements that the pH of sub-surface soil is 5≤pH≤11. One surface sample was outside the required range for surface samples 5≤pH≤10 (result of 10.3). However, given that the upper 2 metres of the Site will be excavated to remediate the Site and more than 2 metres to accommodate the proposed structure, Section 41 of the Regulation does not apply to the Phase Two Property. However, should the soil with higher pH not be removed Section 41 and more sensitive standards would apply.

Shallow Soil Property or Water Body

Overburden thickness at the Site extends beyond 2 metres and is not considered a shallow soil property. The property does not include all or part of a water body and is not adjacent to a water body or include land that is within 30 metres of a water body. This assumes that the open aqueduct is defined as a constructed feature for managing surface water and not a waterbody as defined in the Regulation. Accordingly, Section 43.1 of the Regulation does not apply to the Phase Two Property.

Imported Soil

Fill was identified throughout the Phase Two Property and is present between 1.5 and 3.1 metres depth. The fill was likely placed during initial grading of the Site pre 1900s and during the demolition of the previous structures in the 1960s.

Proposed Buildings and Other Structures

The proposed development plan includes two large residential towers over a commercial podium with underground parking occupying the majority of the Phase Two Property.

DELINEATION OF CONTAMINANT IMPACTS

APEC Where Contaminants are Present at a Concentration Above the Applicable Site Condition Standard

The only documented impacts at the Phase Two Property were PHC, PAH and metals impacts in the shallow fill present in the upper 2 metres (APEC1). Each of the exceedances were delineated by clean native soil samples taken below the impacted fill samples. The fill impacts did not extend to the groundwater and none of the COCs were found in within the groundwater at the Phase Two Property above the site condition standards.

Contaminant Distribution

All of the fill at the Phase Two ESA property is considered as being impacted with 6 of the eleven boreholes at having identified exceedances in the fill. The fill exceedances were limited to the upper 2 metres of the fill. No impacts were present in the groundwater at the Phase Two Property. It is noted that only one of the five boreholes completed as part of the 2022 investigation were impacted compared to all six of the 2012 boreholes which were all impacted. There is the potential that some of the upper fill was removed from the Phase Two Property during the use of the Site as a construction laydown yard for the LRT, however, may also be attributed to variability in the fill and as such is assumed to remain. As such all of the upper fill is inferred to be impacted above the site condition standards, but there may be some areas/pockets which meet site condition standards.

Potential Reason for Discharge into the Environment at the Site

The Site was subject to grading using poor quality fill including demolition material from the previous structures.

Contaminant Migration

None of the contaminants of potential concern were detected in groundwater samples at concentrations exceeding the applicable site condition standards and therefore contaminant migration in groundwater is not relevant to the Site.

Meteorological and Climatic Considerations

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events seasonal trends could not be identified; however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter.

Soil Vapour Intrusion Pathways

The contaminants are mostly non-volatile, however, some of the PAHs may be considered semi-volatile. However, the proposed development will remove all of impacted fill to accommodate the underground parking and foundations. Therefore the soil vapour intrusion pathway is present currently and is expected to be removed during redevelopment.

CROSS-SECTIONS

Lateral and Vertical Distribution of Contaminants

A representative cross-section is presented in Figure 5.

POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS

Given the shallow depth of the impacts (0-2 metres) there is currently potential exposure to human and ecological receptors via direct contact, dust inhalation and soil vapour intrusion. However, the proposed development will remove the upper impacted material as part of the redevelopment effectively removing the exposure potential.

6.0 CONCLUSIONS

The Phase Two ESA investigated the five APEC identified in the 2022 Phase One ESA.

Based on the results of the soil and groundwater samples submitted as part of this Phase Two ESA, the reported concentrations of the contaminants of potential concern were above the applicable site condition standards as of the certification date (February 25, 2022). The impacts are present in the upper 2 metres of the Phase Two Property and would require remediation or risk assessment as part of the redevelopment.

The data presented in this report follows the O. Reg. 153/04 Phase Two ESA report format.

Signature Page

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Table 1: Groundwater Monitoring Well Construction Details

Monitoring Well ID	Ground Surface Elevation (mASL)	Top of Pipe Elevation (mASL)	Borehole Depth (mbgs)	Borehole Depth (masl)	Screen Interval (mbgs)	Screened Media
22-1	62.92	63.7	16.76	46.16	7.6-10.6	Glacial Till
22-2	62.47	63.35	15.85	46.62	7.6-10.6	Glacial Till
22-3	61.65	62.38	14.55	47.1	11.5-14-5	Bedrock
22-4	60.47	61.29	12.19	48.28	8.0-11.0	Glacial Till
22-5	62.34	63.18	15.24	47.1	6.1-9.1	Glacial Till

Notes:

mASL- metres above sea level

mbgs-metres below ground surface

No evidence of free product was observed during elevation or sampling events.

All monitoring wells were completed as stick-up wells with monument casings

Monitoring Well	Top of Pipe Elevation (mASL)	Ground Surface Elevation (mASL)	Depth to Groundwater (mbTOP)	Depth to Groundwater (mbgs)	Groundwater Elevation (mASL)	Date of Measurement
22-1	63.7	62.92	7.78	7.00	55.92	25-Feb-22
22-2	63.35	62.47	7.88	7.00	55.47	25-Feb-22
22-3	62.38	61.65	13	12.27	49.38	25-Feb-22
22-4	61.29	60.47	10.7	9.88	50.59	25-Feb-22
22-5	63.18	62.34	8.22	7.38	54.96	25-Feb-22

All monitoring wells were completed as stick-up wells with monument casings
mbgs- metres below ground surface
mASL- metres above sea level
No evidence of free product was observed during any elevation or sampling events.

Location	Soil Samples Collected	Soil Samples Analyzed	Parameters Analyzed	MECP Table 3 Exceedances
22-1	SA1 through SA20	22-1 SA4 (2.29-2.90 mbgs) 22-1 SA10 (6.86-7.06 mbgs)	PHCs, BTEX, PAHs, VOCs, Metals and Inorganics	**None**
22-2	SA1 through SA14	22-1 SA4 (0.76-1.37 mbgs) 22-1 SA10 (6.86-6.99 mbgs)	PHCs, BTEX, PAHs, VOCs, Metals and Inorganics	**PAHs (benzo(a)pyrene and fluoranthene)**
22-3	SA1 through SA12	22-3 SA12 (and DUP-1) (0-0.61 mbgs) 22-3 SA10 (10.67-10.97 mbgs)	PHCs, BTEX, PAHs, VOCs, Metals and Inorganics	**None**
22-4	SA1 through SA12	22-4 SA5 (1.52-2.13 mbgs) 22-14SA11 (9.14-9.75 mbgs)	PHCs, BTEX, PAHs, VOCs, Metals and Inorganics	**None**
22-5	SA1 through SA14	22-5 SA10 (1.52-2.13 mbgs) 22-1 SA10 (7.62-8.03 mbgs)	PHCs, BTEX, PAHs, VOCs, Metals and Inorganics	**None**

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Bold font indicates parameter exceedance of the MECP Table 3 Standards

PHCs: Petroleum Hydrocarbons (F1-F4)

PAHs: Polycyclic Aromatic Hydrocarbons

EC: Electrical Conductivity

SAR: Sodium Adsorption Ratio

Monitoring Well ID	Screen Interval (mbgs)	Screened Media	Groundwater Samples Submitted for Analysis	Analytical Parameters	MECP Table 3 Exceedances (1)
MW22-1	7.6-10.6	Glacial Till	22-1 + (DUP)	PHCs, BTEX, PAHs, Metals, VOCs	None
MW22-2	7.6-10.6	Glacial Till	22-2	PHCs, BTEX, PAHs, Metals, VOCs	None
MW22-3	11.5-14-5	Bedrock	22-3	PHCs, BTEX, PAHs, Metals, VOCs	None
MW22-4	8.0-11.0	Glacial Till	22-4	PHCs, BTEX, PAHs, Metals, VOCs	None
MW22-5	6.1-9.1	Glacial Till	22-5	PHCs, BTEX, PAHs, Metals, VOCs	None

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

Bold font indicates parameter exceedance of the MECP Table 3 Standards

PHCs: Petroleum Hydrocarbons (F1-F4)

BTEX: Benzene, Toluene, Ethylbenzene, Xylene

PAHs: Polycyclic Aromatic Hydrocarbons

VOCs: Volatile Organic Compounds

Table 5
Soil Analytical Results - Metals

				Current Phase Two ESA Program										
				BH22-1	BH22-1	BH22-2	BH22-2	BH22-3	BH22-3	BH22-3	BH22-4	BH22-4	BH22-5	BH22-5
				02/14/2022	02/16/2022	02/16/2022	02/16/2022	02/22/2022	02/22/2022	02/22/2022	02-23-2022	02-23-2022	02-23-2022	02/24/2022
Parameter	**Unit**	**REG153 (11) T3-R/P/I SOIL COARSE**	**REG153 (11) T1-R/P/I/I/C/C SOIL**	22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	DUP-1 (22-3 SA1)	22-3 SA12	22-4 SA5	22-4 SA11	22-5 SA3	22-5 SA10
Sample Depth	m			2.29-2.90	6.86-7.06	0.76-1.37	6.86-6.99	0-0.61	0-0.61	10.67-10.97	3.05-3.66	9.14-9.75	1.52-2.13	7.62-8.03
Metals														
Antimony	ug/g	**7.5**	1.3	<0.20	<0.20	0.58	<0.20	0.41	0.3	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	ug/g	**18**	18	1.1	<1.0	1.5	<1.0	2.2	2.1	1.4	1.2	<1.0	<1.0	<1.0
Barium	ug/g	**390**	220	38	29	87	31	120	120	130	79	220	61	47
Beryllium	ug/g	**4**	2.5	0.25	<0.20	0.27	<0.20	0.34	0.32	0.4	0.26	0.48	<0.20	<0.20
Boron	ug/g	**120**	36	<5.0	<5.0	<5.0	<5.0	7	6.2	8.8	<5.0	<5.0	<5.0	<5.0
Cadmium	ug/g	**1.2**	1.2	<0.10	<0.10	0.11	<0.10	0.11	0.12	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	ug/g	**160**	70	11	8.9	13	12	33	26	26	17	33	9.4	13
Cobalt	ug/g	**22**	21	4.4	3.1	4.8	3.8	7.8	7	5.7	5.6	10	2.6	7.2
Copper	ug/g	**140**	92	7.6	8.6	11	8.5	19	17	51	16	21	5.2	11
Hexavalent Chromium	ug/g	**8**	0.66	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Lead	ug/g	**120**	120	3.8	2.2	56	3.1	30	28	5.4	14	4.7	7.9	4
Mercury	ug/g	**0.27**	0.27											
Molybdenum	ug/g	**6.9**	2	<0.50	<0.50	0.71	<0.50	0.99	0.93	3.2	1.1	0.8	<0.50	0.77
Nickel	ug/g	**100**	82	8.1	5	8.9	6.8	17	16	14	11	21	5.7	9.2
Selenium	ug/g	**2.4**	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	ug/g	**20**	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	ug/g	**1**	1	0.12	<0.050	0.1	0.075	0.15	0.16	0.12	0.12	0.23	<0.050	0.098
Uranium	ug/g	**23**	2.5	0.4	0.52	0.51	0.49	0.63	0.61	0.56	0.59	0.73	0.36	0.45
Vanadium	ug/g	**86**	86	19	17	24	21	28	26	20	26	47	10	25
Zinc	ug/g	**340**	290	16	12	34	15	56	46	41	37	56	14	16
Electrical Conductivity	uS.cm	**0.7**	0.47	0.29	0.54	0.34	0.21	**0.79**	**0.74**	0.43	**1.1**	0.37	0.32	0.22
Sodium Adsorption Ratio	na	**5**	1	11	7.1	0.38	1.5	1.7	1.6	**7.9**	1.4	**5.9**	1.1	1
pH	na	**5-11**	5-11	8.02	8.11	-	-	10.3	10.6	8.12	8.14	-	-	-

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Table 5
Soil Analytical Results - Metals

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE	REG153 (11) T1-R/P/I/I/C/C SOIL	BH11-33 12/8/2011 BH11-33 SA#10	BH11-33 12/8/2011 (7) BH11-33 SA#2	BH11-33 12/8/2011 BH11-33 SA#6	BH11-33 12/9/2011 BH11-33 SA#17	BH11-35 12/12/2011 BH11-35 SA#2	BH11-35 12/12/2011 BH11-35 SA#6	BH11-37 12/12/2011 BH11-37 SA#2	BH11-37 12/12/2011 BH11-37 SA#5	BH11-37 12/12/2011 BH11-37 SA#9
Sample Depth	m			5.18 - 5.79	0.61 - 1.22	2.74 - 3.35	8.54 - 8.77	0.61 - 1.22	2.44 - 2.95	0.61 - 1.22	2.44 - 2.95	5.18 - 5.79
Metals												
Antimony	ug/g	**7.5**	1.3	<0.20	1.9	<0.20	<0.20	0.98	<0.20	3	<0.20	<0.20
Arsenic	ug/g	**18**	18	<1.0	4.5	1.1	<1.0	2.4	<1.0	5.4	1.4	1.2
Barium	ug/g	**390**	220	63	150	33	29	140	21	250	33	58
Beryllium	ug/g	**4**	2.5	0.21	0.3	<0.20	0.24	<0.20	<0.20	0.22	0.22	<0.20
Boron	ug/g	**120**	36	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	ug/g	**1.2**	1.2	<0.10	0.45	<0.10	<0.10	0.5	<0.10	0.3	<0.10	<0.10
Chromium	ug/g	**160**	70	14	17	8.4	6.8	11	5.6	13	10	11
Cobalt	ug/g	**22**	21	5.2	5.8	3.4	2.6	3.7	2.9	4.5	5.6	3.5
Copper	ug/g	**140**	92	11	26	9.6	6.9	17	6.7	43	9.4	14
Hexavalent Chromium	ug/g	**8**	0.66	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Lead	ug/g	**120**	120	3.6	**540**	11	2.1	**270**	3.5	**490**	6.4	17
Mercury	ug/g	**0.27**	0.27	<0.050	**0.36**	<0.050	<0.050	0.074	<0.050	**1.3**	<0.050	<0.050
Molybdenum	ug/g	**6.9**	2	0.55	0.88	<0.50	0.67	0.98	<0.50	1.5	0.95	1.1
Nickel	ug/g	**100**	82	8.9	13	6.7	4.6	6.8	4.2	10	9.3	6.4
Selenium	ug/g	**2.4**	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.85	<0.50	<0.50
Silver	ug/g	**20**	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	2.9	<0.20	<0.20
Thallium	ug/g	**1**	1	0.087	0.13	0.073	<0.050	0.087	0.062	0.24	0.11	0.073
Uranium	ug/g	**23**	2.5	-	-	-	-	-	-	-	-	-
Vanadium	ug/g	**86**	86	24	26	18	12	14	14	16	18	16
Zinc	ug/g	**340**	290	21	110	20	10	*290*	9.2	130	18	22
Electrical Conductivity	uS.cm	**0.7**	0.47	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio	na	**5**	1	-	-	-	-	-	-	-	-	-
pH	na	**5-11**	5-11	-	-	-	-	-	-	-	-	-

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Table 5
Soil Analytical Results - Metals

				Previous 2012 Phase Two ESA Investigation						
				BH11-38	BH11-38	BH11-38	BH11-38	BH11-39	BH11-39	BH11-39
		REG153 (11)	REG153 (11)	12/19/2011 [7]	12/19/2011	12/19/2011	12/19/2011	12/15/2011	12/15/2011	12/15/2011
Parameter	Unit	T3-R/P/I SOIL COARSE	T1-R/P/I/I/C/C SOIL	BH11-38 SA#1	BH11-38 SA#3	BH11-38 SA#5D	BH11-38 SA#5	BH11-39 SA#1	BH11-39 SA#4	BH11-39 SA#7
Sample Depth	m			0 - 0.61	1.22 - 1.83	2.44 - 3.05	2.44 - 3.05	0 - 0.61	1.83 - 2.34	3.66 - 4.27
Metals										
Antimony	ug/g	**7.5**	1.3	1.4	<0.20	<0.20	<0.20	0.24	<0.20	<0.20
Arsenic	ug/g	**18**	18	3.5	1.3	<1.0	<1.0	1.4	1.4	<1.0
Barium	ug/g	**390**	220	220	46	39	27	41	47	72
Beryllium	ug/g	**4**	2.5	0.23	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	ug/g	**120**	36	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	ug/g	**1.2**	1.2	0.45	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	ug/g	**160**	70	18	21	14	7.2	9	9.5	9.6
Cobalt	ug/g	**22**	21	5.9	4.6	4.3	3.2	5.4	4.7	3.7
Copper	ug/g	**140**	92	79	13	8.8	6.9	12	13	8.2
Hexavalent Chromium	ug/g	**8**	0.66	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Lead	ug/g	**120**	120	**1200**	10	8.2	3.7	12	55	3.4
Mercury	ug/g	**0.27**	0.27	0.22	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Molybdenum	ug/g	**6.9**	2	1.8	0.94	<0.50	<0.50	0.88	0.62	<0.50
Nickel	ug/g	**100**	82	16	43	6.9	5.2	8.5	7.1	6.5
Selenium	ug/g	**2.4**	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	ug/g	**20**	0.5	0.35	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	ug/g	**1**	1	0.11	0.097	0.11	0.07	0.097	0.1	0.08
Uranium	ug/g	**23**	2.5	-	-	-	-	-	-	-
Vanadium	ug/g	**86**	86	20	19	19	15	16	15	17
Zinc	ug/g	**340**	290	280	15	17	14	43	28	13
Electrical Conductivity	uS.cm	**0.7**	0.47	-	-	-	-	-	-	-
Sodium Adsorption Ratio	na	**5**	1	-	-	-	-	-	-	-
pH	na	**5-11**	5-11	-	-	-	-	-	-	-

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Table 5
Soil Analytical Results - Metals

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE	REG153 (11) T1-R/P/I/I/C/C SOIL	BH11-39 12/16/2011 BH11-39 SA#11	BH11-40 12/16/2011 BH11-40 SA#10	BH11-40 12/16/2011 [7] BH11-40 SA#1	BH11-40 12/16/2011 BH11-40 SA#4	BH11-40 12/16/2011 BH11-40 SA#6D (Field Duplicate)	BH11-40 12/16/2011 BH11-40 SA#6
Sample Depth	m			5.94 - 6.25	5.18 - 5.79	0 - 0.61	1.83 - 2.44	3.08 - 3.66	3.08 - 3.66
Metals									
Antimony	ug/g	**7.5**	1.3	<0.20	<0.20	0.53	0.31	<0.20	<0.20
Arsenic	ug/g	**18**	18	1.5	<1.0	1.8	1.2	1.2	<1.0
Barium	ug/g	**390**	220	66	32	79	35	37	40
Beryllium	ug/g	**4**	2.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	ug/g	**120**	36	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	ug/g	**1.2**	1.2	<0.10	<0.10	0.17	<0.10	<0.10	<0.10
Chromium	ug/g	**160**	70	11	6.8	14	10	10	10
Cobalt	ug/g	**22**	21	4.2	2.8	4.2	4.3	4.2	4.8
Copper	ug/g	**140**	92	8.5	6.3	11	9.2	9.4	8.5
Hexavalent Chromium	ug/g	**8**	0.66	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Lead	ug/g	**120**	120	5.7	2	**180**	4.4	3.8	4.8
Mercury	ug/g	**0.27**	0.27	<0.050	<0.050	0.073	0.15	<0.050	<0.050
Molybdenum	ug/g	**6.9**	2	<0.50	<0.50	0.73	<0.50	<0.50	<0.50
Nickel	ug/g	**100**	82	7.2	4.2	13	7.6	7	7.6
Selenium	ug/g	**2.4**	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	ug/g	**20**	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	ug/g	**1**	1	0.095	<0.050	0.097	0.085	0.091	0.098
Uranium	ug/g	**23**	2.5	-	-	-	-	-	-
Vanadium	ug/g	**86**	86	18	14	23	19	17	18
Zinc	ug/g	**340**	290	17	8.7	59	18	22	16
Electrical Conductivity	uS.cm	**0.7**	0.47	-	-	-	-	-	-
Sodium Adsorption Ratio	na	**5**	1	-	-	-	-	-	-
pH	na	**5-11**	5-11	-	-	-	-	-	-

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Insitutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Table 5
Soil Analytical Results - PAH

				Current Phase Two ESA Program								
				BH22-1	BH22-1	BH22-2	BH22-2	BH22-3	BH22-3	BH22-3	BH22-4	BH22-4
				02/14/2022	02/16/2022	02/16/2022	02/16/2022	02/22/2022	02/22/2022	02/22/2022	02-23-2022	02-23-2022
Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE	REG153 (11) T1 R/P/I/I/C/C SOIL	22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	DUP-1 (22-3 SA1)	22-3 SA12	22-4 SA5	22-4 SA11
Sample Depth	m			2.29-2.90	6.86-7.06	0.76-1.37	6.86-6.99	0-0.61	0-0.61	10.67-10.97	3.05-3.66	9.14-9.75
Semi-VOCs												
1-Methylnaphthalene	ug/g	**0.99**	0.59	<0.0050	<0.0050	0.0093	<0.0050	0.0067	0.0057	<0.0050	0.011	<0.0050
2-Methylnaphthalene	ug/g	**0.99**	0.59	<0.0050	<0.0050	0.01	<0.0050	0.0082	0.0064	<0.0050	0.015	<0.0050
Acenaphthene	ug/g	**7.9**	0.072	<0.0050	<0.0050	0.058	<0.0050	0.018	0.034	<0.0050	0.022	<0.0050
Acenaphthylene	ug/g	**0.15**	0.093	<0.0050	<0.0050	0.027	<0.0050	0.006	0.0079	<0.0050	0.014	<0.0050
Anthracene	ug/g	**0.67**	0.16	<0.0050	<0.0050	0.13	<0.0050	0.036	0.096	<0.0050	0.057	<0.0050
Benzo [b,j] fluoranthene	ug/g	**--**	--	0.013	<0.0050	0.52	<0.0050	0.067	0.24	<0.0050	0.13	<0.0050
Benzo[a]anthracene	ug/g	**0.5**	0.36	0.01	<0.0050	0.48	<0.0050	0.065	0.25	<0.0050	0.12	<0.0050
Benzo[a]pyrene	ug/g	**0.3**	0.3	0.0083	<0.0050	**0.4**	<0.0050	0.047	0.18	<0.0050	0.091	<0.0050
Benzo[g,h,i]perylene	ug/g	**6.6**	0.68	0.0061	<0.0050	0.24	<0.0050	0.029	0.1	<0.0050	0.061	<0.0050
Benzo[k]fluoranthene	ug/g	**0.78**	0.48	<0.0050	<0.0050	0.22	<0.0050	0.023	0.082	<0.0050	0.043	<0.0050
Chrysene	ug/g	**7**	2.8	0.009	<0.0050	0.35	<0.0050	0.047	0.18	<0.0050	0.086	<0.0050
Dibenzo[a,h]anthracene	ug/g	**0.1**	0.1	<0.0050	<0.0050	0.054	<0.0050	0.0067	0.023	<0.0050	0.014	<0.0050
Fluoranthene	ug/g	**0.69**	0.56	0.023	<0.0050	**1.1**	<0.0050	0.15	0.52	<0.0050	0.26	<0.0050
Fluorene	ug/g	**62**	0.12	<0.0050	<0.0050	0.055	<0.0050	0.014	0.027	<0.0050	0.033	<0.0050
Indeno[1,2,3-cd]pyrene	ug/g	**0.38**	0.23	0.0059	<0.0050	0.26	<0.0050	0.033	0.11	<0.0050	0.065	<0.0050
Naphthalene	ug/g	**0.6**	0.09	<0.0050	<0.0050	0.017	<0.0050	0.0088	0.0079	<0.0050	0.042	<0.0050
Phenanthrene	ug/g	**6.2**	0.69	0.018	<0.0050	0.61	<0.0050	0.13	0.33	0.0061	0.2	<0.0050
Pyrene	ug/g	**78**	1	0.018	<0.0050	0.84	<0.0050	0.11	0.4	<0.0050	0.19	<0.0050

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE	REG153 (11) T1 R/P/I/I/C/C SOIL	BH22-5 02-23-2022 22-5 SA3	BH22-5 02/24/2022 22-5 SA10	BH11-33 12/8/2011 BH11-33 SA#10	BH11-33 12/8/2011 [7] BH11-33 SA#2	BH11-33 12/8/2011 BH11-33 SA#6	BH11-33 12/9/2011 BH11-33 SA#17	BH11-35 12/12/2011 BH11-35 SA#2	BH11-35 12/12/2011 BH11-35 SA#6	BH11-37 12/12/2011 BH11-37 SA#2	BH11-37 12/12/2011 BH11-37 SA#5	BH11-37 12/12/2011 BH11-37 SA#9
Sample Depth	m			1.52-2.13	7.62-8.03	5.18 - 5.79	0.61 - 1.22	2.74 - 3.35	8.54 - 8.77	0.61 - 1.22	2.44 - 2.95	0.61 - 1.22	2.44 - 2.95	5.18 - 5.79
Semi-VOCs														
1-Methylnaphthalene	ug/g	**0.99**	0.59	<0.0050	<0.0050	<0.0050	<0.025	<0.0050	<0.0050	0.038	<0.0050	0.0072	<0.0050	<0.0050
2-Methylnaphthalene	ug/g	**0.99**	0.59	0.0054	<0.0050	<0.0050	<0.025	<0.0050	<0.0050	0.04	<0.0050	0.0063	<0.0050	<0.0050
Acenaphthene	ug/g	**7.9**	0.072	0.016	<0.0050	<0.0050	0.046	<0.0050	<0.0050	0.24	<0.0050	0.03	<0.0050	<0.0050
Acenaphthylene	ug/g	**0.15**	0.093	0.0068	<0.0050	<0.0050	0.052	<0.0050	<0.0050	0.09	<0.0050	0.022	<0.0050	<0.0050
Anthracene	ug/g	**0.67**	0.16	0.043	<0.0050	<0.0050	0.15	<0.0050	<0.0050	0.47	<0.0050	0.12	<0.0050	<0.0050
Benzo [b,j] fluoranthene	ug/g	**--**	--	0.11	<0.0050	<0.0050	0.59	<0.0050	<0.0050	1.4	<0.0050	0.3	<0.0050	<0.0050
Benzo[a]anthracene	ug/g	**0.5**	0.36	0.11	<0.0050	<0.0050	**0.56**	<0.0050	<0.0050	**1.6**	<0.0050	0.28	<0.0050	<0.0050
Benzo[a]pyrene	ug/g	**0.3**	0.3	0.083	<0.0050	<0.0050	**0.49**	<0.0050	<0.0050	**1.5**	<0.0050	0.27	<0.0050	<0.0050
Benzo[g,h,i]perylene	ug/g	**6.6**	0.68	0.048	<0.0050	<0.0050	0.33	<0.0050	<0.0050	0.76	<0.0050	0.14	<0.0050	<0.0050
Benzo[k]fluoranthene	ug/g	**0.78**	0.48	0.046	<0.0050	<0.0050	0.24	<0.0050	<0.0050	0.53	<0.0050	0.11	<0.0050	<0.0050
Chrysene	ug/g	**7**	2.8	0.083	<0.0050	<0.0050	0.57	<0.0050	<0.0050	1.3	<0.0050	0.22	<0.0050	<0.0050
Dibenzo[a,h]anthracene	ug/g	**0.1**	0.1	0.0098	<0.0050	<0.0050	0.093	<0.0050	<0.0050	**0.25**	<0.0050	0.051	<0.0050	<0.0050
Fluoranthene	ug/g	**0.69**	0.56	0.25	<0.0050	<0.0050	**1.1**	<0.0050	<0.0050	**2.8**	0.0066	0.54	<0.0050	<0.0050
Fluorene	ug/g	**62**	0.12	0.02	<0.0050	<0.0050	0.049	<0.0050	<0.0050	0.19	<0.0050	0.035	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	ug/g	**0.38**	0.23	0.053	<0.0050	<0.0050	0.35	<0.0050	<0.0050	**0.78**	<0.0050	0.16	<0.0050	<0.0050
Naphthalene	ug/g	**0.6**	0.09	0.011	<0.0050	<0.0050	<0.025	<0.0050	<0.0050	0.042	<0.0050	0.0076	<0.0050	<0.0050
Phenanthrene	ug/g	**6.2**	0.69	0.18	<0.0050	<0.0050	0.65	<0.0050	<0.0050	2.2	<0.0050	0.37	<0.0050	<0.0050
Pyrene	ug/g	**78**	1	0.19	<0.0050	<0.0050	1.0	<0.0050	<0.0050	3.6	0.0064	0.48	<0.0050	<0.0050

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Table 5
Soil Analytical Results - PAH

				Previous 2012 Phase Two ESA Investigation												
				BH11-38	BH11-38	BH11-38	BH11-38	BH11-39	BH11-39	BH11-39	BH11-39	BH11-40	BH11-40	BH11-40	BH11-40	BH11-40
		REG153 (11) T3-R/P/I SOIL	REG153 (11) T1 R/P/I/I/C/C SOIL	12/19/2011 (7)	12/19/2011	12/19/2011	12/19/2011	12/15/2011	12/15/2011	12/15/2011	12/16/2011	12/16/2011	12/16/2011 (7)	12/16/2011	12/16/2011	12/16/2011
Parameter	**Unit**	**COARSE**		BH11-38 SA#1	BH11-38 SA#3	BH11-38 SA#5D	BH11-38 SA#5	BH11-39 SA#1	BH11-39 SA#4	BH11-39 SA#7	BH11-39 SA#11	BH11-40 SA#10	BH11-40 SA#1	BH11-40 SA#4	BH11-40 SA#5D (Field Duplicate)	BH11-40 SA#6
Sample Depth	m			0 - 0.61	1.22 - 1.83	2.44 - 3.05	2.44 - 3.05	0 - 0.61	1.83 - 2.34	3.66 - 4.27	5.94 - 6.25	5.18 - 5.79	0 - 0.61	1.83 - 2.44	3.08 - 3.66	3.08 - 3.66
Semi-VOCs																
1-Methylnaphthalene	ug/g	**0.99**	0.59	0.033	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.23	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	ug/g	**0.99**	0.59	0.03	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.26	<0.0050	<0.0050	<0.0050
Acenaphthene	ug/g	**7.9**	0.072	0.12	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	1.4	<0.0050	<0.0050	<0.0050
Acenaphthylene	ug/g	**0.15**	0.093	**0.17**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.15	<0.0050	<0.0050	<0.0050
Anthracene	ug/g	**0.67**	0.16	0.5	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**2.6**	0.016	<0.0050	<0.0050
Benzo [b,j] fluoranthene	ug/g	--	--	1.5	<0.0050	<0.0050	<0.0050	0.015	<0.0050	<0.0050	<0.0050	<0.0050	4.5	0.057	<0.0050	<0.0050
Benzo[a]anthracene	ug/g	**0.5**	0.36	**1.2**	<0.0050	<0.0050	<0.0050	0.012	<0.0050	<0.0050	<0.0050	<0.0050	**6.3**	0.047	<0.0050	<0.0050
Benzo[a]pyrene	ug/g	**0.3**	0.3	**1.3**	<0.0050	<0.0050	<0.0050	0.013	<0.0050	<0.0050	<0.0050	<0.0050	**4.2**	0.046	<0.0050	<0.0050
Benzo[g,h,i]perylene	ug/g	**6.6**	0.68	0.7	<0.0050	<0.0050	<0.0050	0.0085	<0.0050	<0.0050	<0.0050	<0.0050	2.1	0.026	<0.0050	<0.0050
Benzo[k]fluoranthene	ug/g	**0.78**	0.48	0.54	<0.0050	<0.0050	<0.0050	0.006	<0.0050	<0.0050	<0.0050	<0.0050	**1.7**	0.025	<0.0050	<0.0050
Chrysene	ug/g	**7**	2.8	1	<0.0050	<0.0050	<0.0050	0.0098	<0.0050	<0.0050	<0.0050	<0.0050	4.1	0.045	<0.0050	<0.0050
Dibenzo[a,h]anthracene	ug/g	**0.1**	0.1	**0.19**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.54**	0.0063	<0.0050	<0.0050
Fluoranthene	ug/g	**0.69**	0.56	**3.2**	<0.0050	<0.0050	<0.0050	0.022	<0.0050	<0.0050	<0.0050	0.0078	**16**	0.11	<0.0050	<0.0050
Fluorene	ug/g	**62**	0.12	0.14	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	1.6	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	ug/g	**0.38**	0.23	**0.85**	<0.0050	<0.0050	<0.0050	0.0093	<0.0050	<0.0050	<0.0050	<0.0050	**2.5**	0.025	<0.0050	<0.0050
Naphthalene	ug/g	**0.6**	0.09	0.056	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.34	<0.0050	<0.0050	<0.0050
Phenanthrene	ug/g	**6.2**	0.69	2.2	<0.0050	<0.0050	<0.0050	0.011	<0.0050	<0.0050	<0.0050	0.0057	**18**	0.060	<0.0050	<0.0050
Pyrene	ug/g	**78**	1	2.6	<0.0050	<0.0050	<0.0050	0.021	<0.0050	<0.0050	<0.0050	0.0066	14	0.096	<0.0050	<0.0050

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE	REG153 (11) T1-R/P/I/I/C/C SOIL	Current Phase Two ESA Program										
				BH22-1	BH22-1	BH22-2	BH22-2	BH22-3	BH22-3	BH22-3	BH22-4	BH22-4	BH22-5	BH22-5
				02/14/2022	02/16/2022	02/16/2022	02/16/2022	02/22/2022	02/22/2022	02/22/2022	02-23-2022	02-23-2022	02-23-2022	02/24/2022
				22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	DUP-1 (22-3 SA1)	22-3 SA12	22-4 SA5	22-4 SA11	22-5 SA3	22-5 SA10
Sample Depth	m			2.29-2.90	6.86-7.06	0.76-1.37	6.86-6.99	0-0.61	0-0.61	10.67-10.97	3.05-3.66	9.14-9.75	1.52-2.13	7.62-8.03
Petroleum Hydrocarbons														
Benzene	ug/g	**0.21**	0.02	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Ethylbenzene	ug/g	**2**	0.05	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
m,p-Xylenes	ug/g	**--**	--	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
o-Xylene	ug/g	**--**	--	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	**55**	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	ug/g	**55**	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	**98**	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	**300**	240	<50	<50	83	<50	100	87	<50	73	<50	<50	<50
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	**2800**	120	<50	<50	<50	<50	190	160	<50	<50	<50	<50	<50
Petroleum Hydrocarbons - F4 Gravimetric	ug/g	**2800**	120	-	-	-	-	810	-	-	-	-	-	-
Toluene	ug/g	**2.3**	0.2	<0.020	<0.020	0.037	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Xylenes, Total	ug/g	**3.1**	0.05	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

																Previous 2012 Phase Two ESA Inve
Parameter	**Unit**	**REG153 (11) T3-R/P/I SOIL COARSE**	**REG153 (11) T1-R/P/I/I/C/C SOIL**	**BH11-33** 12/8/2011 BH11-33 SA#10	**BH11-33** 12/8/2011 [6] BH11-33 SA#2	**BH11-33** 12/8/2011 BH11-33 SA#6	**BH11-33** 12/9/2011 BH11-33 SA#17	**BH11-35** 12/12/2011 BH11-35 SA#2	**BH11-35** 12/12/2011 BH11-35 SA#6	**BH11-37** 12/12/2011 BH11-37 SA#2	**BH11-37** 12/12/2011 BH11-37 SA#5	**BH11-37** 12/12/2011 BH11-37 SA#9	**BH11-38** 12/19/2011 [6] BH11-38 SA#1	**BH11-38** 12/19/2011 BH11-38 SA#3	**BH11-38** 12/19/2011 BH11-38 SA#5D
Sample Depth	m			5.18 - 5.79	0.61 - 1.22	2.74 - 3.35	8.54 - 8.77	0.61 - 1.22	2.44 - 2.95	0.61 - 1.22	2.44 - 2.95	5.18 - 5.79	0 - 0.61	1.22 - 1.83	2.44 - 3.05
Petroleum Hydrocarbons															
Benzene	ug/g	**0.21**	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g	**2**	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	ug/g	**--**	--	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	ug/g	**--**	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	**55**	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	ug/g	**55**	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	**98**	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	**300**	240	<10	61	<10	<10	160	<10	200	<10	<10	61	<10	<10
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	**2800**	120	<10	41	<10	<10	94	<10	1300	<10	<10	110	<10	<10
Petroleum Hydrocarbons - F4 Gravimetric	ug/g	**2800**	120	--	270	--	--	310	--	**7100**	--	--	780	--	--
Toluene	ug/g	**2.3**	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylenes, Total	ug/g	**3.1**	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

Table 5
Soil Analytical Results - PHC

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE	REG153 (11) T1-R/P/I/I/C/C SOIL	stigation BH11-38 12/19/2011 BH11-38 SA#5	BH11-39 12/15/2011 BH11-39 SA#1	BH11-39 12/15/2011 BH11-39 SA#4	BH11-39 12/15/2011 BH11-39 SA#7	BH11-39 12/16/2011 BH11-39 SA#11	BH11-40 12/16/2011 BH11-40 SA#10	BH11-40 12/16/2011 [6] BH11-40 SA#1	BH11-40 12/16/2011 BH11-40 SA#4	BH11-40 12/16/2011 BH11-40 SA#6D (Field Duplicate)	BH11-40 12/16/2011 BH11-40 SA#6
Sample Depth	m			2.44 - 3.05	0 - 0.61	1.83 - 2.34	3.66 - 4.27	5.94 - 6.25	5.18 - 5.79	0 - 0.61	1.83 - 2.44	3.08 - 3.66	3.08 - 3.66
Petroleum Hydrocarbons													
Benzene	ug/g	**0.21**	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g	**2**	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	ug/g	**--**	--	<0.04	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	ug/g	**--**	--	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	**55**	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	ug/g	**55**	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	**98**	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	**300**	240	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	**2800**	120	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F4 Gravimetric	ug/g	**2800**	120	--	--	--	--	--	--	--	--	--	--
Toluene	ug/g	**2.3**	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylenes, Total	ug/g	**3.1**	0.05	<0.04	0.12	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

				Current Phase Two ESA Program										
		REG153 (11) T3-R/P/I SOIL	REG153 (11) T1-R/P/I/I/C/C SOIL	BH22-1	BH22-1	BH22-2	BH22-2	BH22-3	BH22-3	BH22-3	BH22-4	BH22-4	BH22-5	BH22-5
				02/14/2022	02/16/2022	02/16/2022	02/16/2022	02/22/2022	02/22/2022	02/22/2022	02-23-2022	02-23-2022	02-23-2022	02/24/2022
Parameter	Unit	COARSE		22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	DUP-1 (22-3 SA1)	22-3 SA12	22-4 SA5	22-4 SA11	22-5 SA3	22-5 SA10
Sample Depth	m			2.29-2.90	6.86-7.06	0.76-1.37	6.86-6.99	0-0.61	0-0.61	10.67-10.97	3.05-3.66	9.14-9.75	1.52-2.13	7.62-8.03
VOCs														
1,3-Dichloropropene (cis+trans)	ug/g	**0.05**	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acetone (2-Propanone)	ug/g	**16**	0.5	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
Benzene	ug/g	**0.21**	0.02	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Bromodichloromethane	ug/g	**13**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Bromoform	ug/g	**0.27**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Bromomethane	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Carbon Tetrachloride	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Chlorobenzene	ug/g	**2.4**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Chloroform	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Dibromochloromethane	ug/g	**9.4**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,2-Dichlorobenzene	ug/g	**3.4**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,3-Dichlorobenzene	ug/g	**4.8**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,4-Dichlorobenzene	ug/g	**0.083**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Dichlorodifluoromethane (FREON 12)	ug/g	**16**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,1-Dichloroethane	ug/g	**3.5**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,2-Dichloroethane	ug/g	**0.05**	0.05	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
1,1-Dichloroethylene	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
cis-1,2-Dichloroethylene	ug/g	**3.4**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
trans-1,2-Dichloroethylene	ug/g	**0.084**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,2-Dichloropropane	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
cis-1,3-Dichloropropene	ug/g	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
trans-1,3-Dichloropropene	ug/g	-	-	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Ethylbenzene	ug/g	**2**	0.05	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ethylene Dibromide	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Hexane	ug/g	**2.8**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	0.05	<0.040	<0.040	<0.040	<0.040	<0.040
Methylene Chloride(Dichloromethane)	ug/g	**0.1**	0.05	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
Methyl Ethyl Ketone (2-Butanone)	ug/g	**16**	0.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Methyl Isobutyl Ketone	ug/g	**1.7**	0.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Methyl t-butyl ether (MTBE)	ug/g	**0.75**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Styrene	ug/g	**0.7**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,1,1,2-Tetrachloroethane	ug/g	**0.058**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,1,2,2-Tetrachloroethane	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Tetrachloroethylene	ug/g	**0.28**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Toluene	ug/g	**2.3**	0.2	<0.020	<0.020	0.037	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1,1,1-Trichloroethane	ug/g	**0.38**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
1,1,2-Trichloroethane	ug/g	**0.05**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Trichloroethylene	ug/g	**0.061**	0.05	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorofluoromethane (FREON 11)	ug/g	**4**	0.05	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Vinyl Chloride	ug/g	**0.02**	0.05	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Total Xylenes	ug/g	**3.1**	0.05	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, Residential/Parkland/Institutional, coarse grained soil.
Bold underlined indicates an Exceedance of the MECP Table 3 Standards
underlined value indicates an Exceedance of the comparative Table 1 Background site condition standard.

			BH22-1	DUP (22-1)	BH22-2	BH22-3	BH22-4	BH22-5	BLANK
		REG153 (11) T3-	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022
Volatile Organics	**UNITS**	**GW**							
Acetone (2-Propanone)	ug/L	**130000**	47	41	<10	<10	110	12	<10
Benzene	ug/L	**44**	0.19	0.2	2	<0.17	0.47	0.21	<0.20
Bromodichloromethane	ug/L	**85000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	ug/L	**380**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	**5.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	ug/L	**0.79**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19
Chlorobenzene	ug/L	**630**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	ug/L	**2.4**	<0.20	<0.20	<0.20	0.89	**7.5***	<0.20	<0.20
Dibromochloromethane	ug/L	**82000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	ug/L	**4600**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
1,3-Dichlorobenzene	ug/L	**9600**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
1,4-Dichlorobenzene	ug/L	**8**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
Dichlorodifluoromethane (FREON 12)	ug/L	**4400**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	ug/L	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.49
1,1-Dichloroethylene	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,2-Dichloroethylene	ug/L	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	ug/L	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	ug/L	**-**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L	**-**	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	ug/L	**16**	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	ug/L	**2300**	<0.20	<0.20	0.23	<0.20	<0.20	<0.20	<0.20
Ethylene Dibromide	ug/L	**0.25**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19
Hexane	ug/L	**51**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride(Dichloromethane)	ug/L	**610**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone (2-Butanone)	ug/L	**470000**	<10	<10	<10	<10	27	<10	<10
Methyl Isobutyl Ketone	ug/L	**14000**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl t-butyl ether (MTBE)	ug/L	**190**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	ug/L	**1300**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
1,1,1,2-Tetrachloroethane	ug/L	**3.3**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	ug/L	**3.2**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
Tetrachloroethylene	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	ug/L	**18000**	0.25	0.26	6	<0.20	0.5	0.24	<0.20
1,1,1-Trichloroethane	ug/L	**640**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	ug/L	**4.7**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
Trichloroethylene	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane (FREON 11)	ug/L	**2500**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	ug/L	**0.5**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
p+m-Xylene	ug/L	**-**	<0.20	<0.20	1.9	<0.20	<0.20	<0.20	<0.20
o-Xylene	ug/L	**-**	<0.20	<0.20	0.59	<0.20	<0.20	<0.20	<0.20
Total Xylenes	ug/L	**4200**	<0.20	<0.20	2.5	<0.20	<0.20	<0.20	<0.20
Petroleum Hydrocarbons									
F1 (C6-C10)	ug/L	**420**	<25	<25	<25	<25	<25	<25	-
F1 (C6-C10) - BTEX	ug/L	**420**	<25	<25	<25	<25	<25	<25	-
F2 (C10-C16 Hydrocarbons)	ug/L	**150**	<100	<100	<100	<100	<100	<100	-
F3 (C16-C34 Hydrocarbons)	ug/L	**500**	<200	<200	<200	220	<200	<200	-
F4 (C34-C50 Hydrocarbons)	ug/L	**500**	<200	<200	<200	<200	<200	<200	-

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, All Property Uses.
"*" Chloroform the result of municipal supplied drinking water and not considered as an exceedance
Bold underlined indicates an Exceedance of the MECP Table 3 Standards

		REG153 (11) T3-GW	BH22-1	DUP (22-1)	BH22-2	BH22-3	BH22-4	BH22-5
Date			**25/02/2022**	**25/02/2022**	**25/02/2022**	**25/02/2022**	**25/02/2022**	**25/02/2022**
Metals	**UNITS**							
Dissolved Antimony (Sb)	ug/L	**20000**	<0.50	<0.50	<0.50	0.57	<0.50	<2.5
Dissolved Arsenic (As)	ug/L	**1900**	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Dissolved Barium (Ba)	ug/L	**29000**	380	370	49	96	73	280
Dissolved Beryllium (Be)	ug/L	**67**	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0
Dissolved Boron (B)	ug/L	**45000**	130	130	240	160	100	250
Dissolved Cadmium (Cd)	ug/L	**2.7**	0.092	0.095	<0.090	<0.090	<0.090	<0.45
Dissolved Chromium (Cr)	ug/L	**810**	<5.0	<5.0	<5.0	<5.0	<5.0	43
Dissolved Cobalt (Co)	ug/L	**66**	4	4	6.1	1.1	<0.50	18
Dissolved Copper (Cu)	ug/L	**87**	2.1	1.6	1.4	2.8	1.2	73
Dissolved Lead (Pb)	ug/L	**25**	<0.50	<0.50	<0.50	<0.50	<0.50	20
Dissolved Molybdenum (Mo)	ug/L	**9200**	16	16	28	17	38	3.1
Dissolved Nickel (Ni)	ug/L	**490**	8.7	8.3	12	6.4	<1.0	40
Dissolved Selenium (Se)	ug/L	**63**	<2.0	<2.0	<2.0	<2.0	<2.0	<10
Dissolved Silver (Ag)	ug/L	**1.5**	<0.090	<0.090	<0.090	<0.090	<0.090	<0.45
Dissolved Sodium (Na)	ug/L	**2300000**	1300000	1200000	400000	450000	150000	210000
Dissolved Thallium (Tl)	ug/L	**510**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.25
Dissolved Uranium (U)	ug/L	**420**	8.9	8.9	6.9	2.6	0.23	8.7
Dissolved Vanadium (V)	ug/L	**250**	0.76	0.73	<0.50	<0.50	<0.50	30
Dissolved Zinc (Zn)	ug/L	**1100**	<5.0	<5.0	<5.0	10	<5.0	63

Notes:

Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, All Property Uses.

Bold underlined indicates an Exceedance of the MECP Table 3 Standards

		REG153 (11) T3-GW	BH22-1	DUP (22-1)	BH22-2	BH22-3	BH22-4	BH22-5
			25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022
Polyaromatic Hydrocarbons	**UNITS**							
Acenaphthene	ug/L	**600**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	ug/L	**1.8**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	ug/L	**2.4**	<0.050	<0.050	<0.050	<0.050	<0.050	0.074
Benzo(a)anthracene	ug/L	**4.7**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	ug/L	**0.81**	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	0.031
Benzo(b/j)fluoranthene	ug/L	**0.75**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	ug/L	**0.2**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	ug/L	**0.4**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	ug/L	**1**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibenzo(a,h)anthracene	ug/L	**0.52**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	ug/L	**130**	<0.050	<0.050	<0.050	<0.050	<0.050	0.22
Fluorene	ug/L	**400**	<0.050	<0.050	<0.050	<0.050	<0.050	0.11
Indeno(1,2,3-cd)pyrene	ug/L	**0.2**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1-Methylnaphthalene	ug/L	**1800**	0.068	0.067	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	ug/L	**1800**	0.084	0.078	<0.050	<0.050	<0.050	0.091
Naphthalene	ug/L	**1400**	<0.050	<0.050	0.05	<0.050	<0.050	0.07
Phenanthrene	ug/L	**580**	0.51	0.47	0.084	0.049	0.041	0.71
Pyrene	ug/L	**68**	0.12	0.11	<0.050	0.1	<0.050	0.19

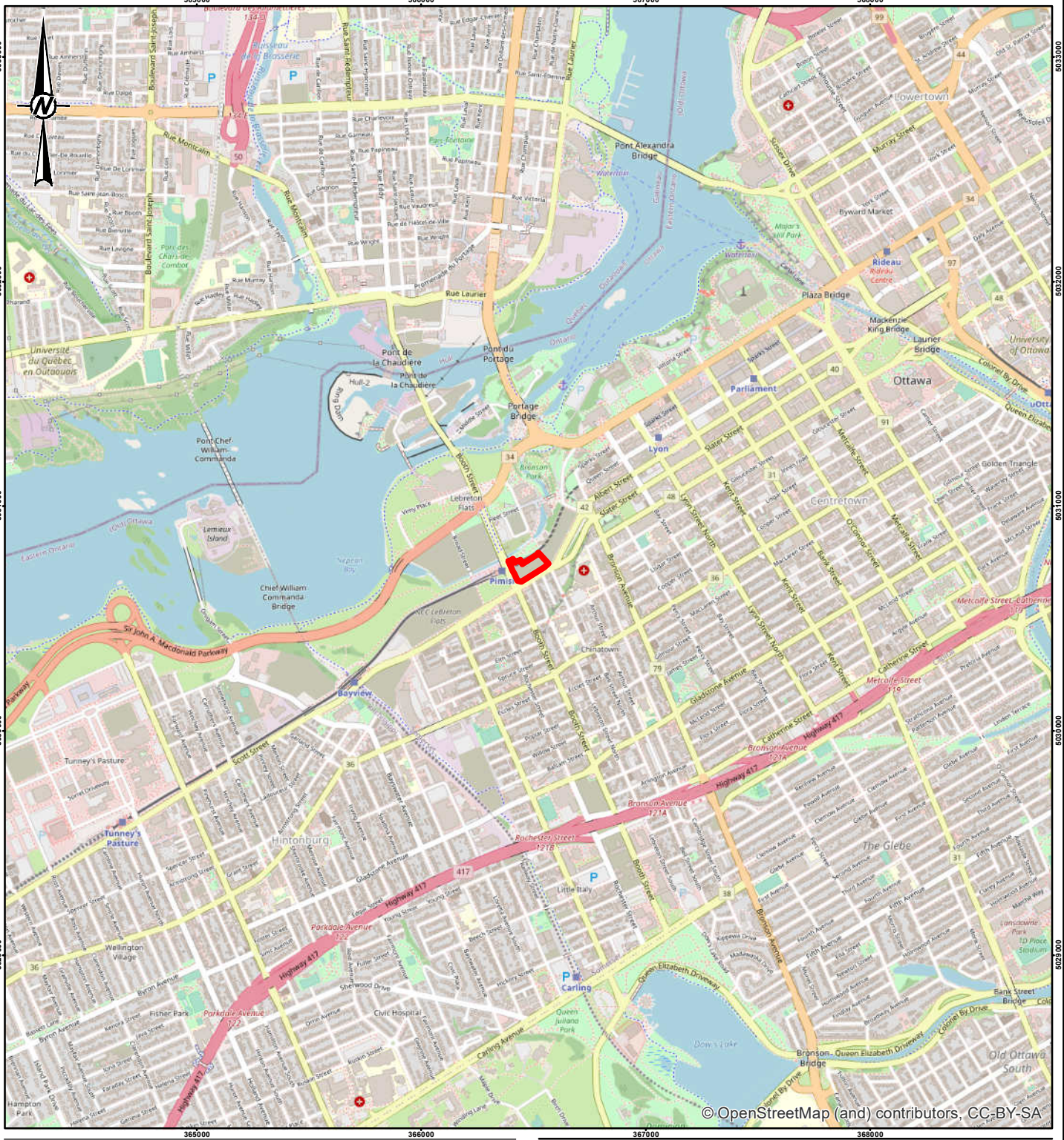
Notes:

Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, All Property Uses.

Bold underlined indicates an Exceedance of the MECP Table 3 Standards

			BH22-1	DUP (22-1)	BH22-2	BH22-3	BH22-4	BH22-5	BLANK
		REG153 (11) T3-	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022	25/02/2022
Volatile Organics	**UNITS**	**GW**							
Acetone (2-Propanone)	ug/L	**130000**	47	41	<10	<10	110	12	<10
Benzene	ug/L	**44**	0.19	0.2	2	<0.17	0.47	0.21	<0.20
Bromodichloromethane	ug/L	**85000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	ug/L	**380**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	**5.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	ug/L	**0.79**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19
Chlorobenzene	ug/L	**630**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	ug/L	**2.4**	<0.20	<0.20	<0.20	0.89	**7.5***	<0.20	<0.20
Dibromochloromethane	ug/L	**82000**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	ug/L	**4600**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
1,3-Dichlorobenzene	ug/L	**9600**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
1,4-Dichlorobenzene	ug/L	**8**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
Dichlorodifluoromethane (FREON 12)	ug/L	**4400**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	ug/L	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.49
1,1-Dichloroethylene	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,2-Dichloroethylene	ug/L	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	ug/L	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	ug/L	**-**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,3-Dichloropropene	ug/L	**-**	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	ug/L	**16**	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	ug/L	**2300**	<0.20	<0.20	0.23	<0.20	<0.20	<0.20	<0.20
Ethylene Dibromide	ug/L	**0.25**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.19
Hexane	ug/L	**51**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride(Dichloromethane)	ug/L	**610**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Ethyl Ketone (2-Butanone)	ug/L	**470000**	<10	<10	<10	<10	27	<10	<10
Methyl Isobutyl Ketone	ug/L	**14000**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl t-butyl ether (MTBE)	ug/L	**190**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	ug/L	**1300**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
1,1,1,2-Tetrachloroethane	ug/L	**3.3**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	ug/L	**3.2**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
Tetrachloroethylene	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	ug/L	**18000**	0.25	0.26	6	<0.20	0.5	0.24	<0.20
1,1,1-Trichloroethane	ug/L	**640**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	ug/L	**4.7**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40
Trichloroethylene	ug/L	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane (FREON 11)	ug/L	**2500**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	ug/L	**0.5**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
p+m-Xylene	ug/L	**-**	<0.20	<0.20	1.9	<0.20	<0.20	<0.20	<0.20
o-Xylene	ug/L	**-**	<0.20	<0.20	0.59	<0.20	<0.20	<0.20	<0.20
Total Xylenes	ug/L	**4200**	<0.20	<0.20	2.5	<0.20	<0.20	<0.20	<0.20
Petroleum Hydrocarbons									
F1 (C6-C10)	ug/L	**420**	<25	<25	<25	<25	<25	<25	-
F1 (C6-C10) - BTEX	ug/L	**420**	<25	<25	<25	<25	<25	<25	-
F2 (C10-C16 Hydrocarbons)	ug/L	**150**	<100	<100	<100	<100	<100	<100	-
F3 (C16-C34 Hydrocarbons)	ug/L	**500**	<200	<200	<200	220	<200	<200	-
F4 (C34-C50 Hydrocarbons)	ug/L	**500**	<200	<200	<200	<200	<200	<200	-

Notes:
Standards - MECP Table 3 Generic Site Condition Standards for Non-Potable Groundwater Condition, All Property Uses.
"*" Chloroform the result of municipal supplied drinking water and not considered as an exceedance
Bold underlined indicates an Exceedance of the MECP Table 3 Standards



LEGEND

PHASE TWO SITE

0 250 500 1,000

1:25,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

CLIENT

DREAM

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE

KEY PLAN

CONSULTANT

WSP GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	----
PREPARED	JEM
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

Path: N:\Active\Spatial_IM\NCC\Library\Parcel\09_PRO\22511882_Dream_Library\Parcel\Lebreton\0002_PhaseTwoESA\22511882-0002-HS-0001.mxd

LEGEND

- ROADWAY
- FORMER ROADWAY (WELLINGTON STREET)
- FORMER RAILWAY
- ID #9 (PCA 46) LOCATION
- PHASE TWO SITE
- PHASE ONE STUDY
- POTENTIALLY CONTAMINATING ACTIVITY (PCA)

ID	PCA	Description
1	30	Poor quality fill
2	46	Formerly Canada Atlantic / Grand Trunk / Canadian National Railway
3	37	Formerly Chinese Laundry - possible dry-cleaning service (165 Bridge/Booth St.)
4	45	Formerly Continental Paper Products Company (305 Bridge/Booth St.)
5	30	Federally contaminated sites (ERIS)
6	30	Federally contaminated sites (ERIS)
7	30	Federally contaminated sites (ERIS)
8	46	Formerly Canada Atlantic / Grand Trunk / Canadian National Railway
9	46	Formerly Canadian National Railway Yard
10	34	Formerly Laurentian Foundry (25-27 Ottawa St.)
11	34	Formerly Corportation Work Shops (street name is unclear, address is 28)
12	10/28/52	Formerly Tapp's Garage (610 Wellington St.)
13	39	Formerly Ottawa Paint Works (689 Wellington St.)
14	10/28	Formerly Chaudiere Garage with two USTs (691 Wellington St.)
15	45	Formerly Ottawa Paper Box Co. Ltd. (764 Albert St.)
16	28	Formerly Red Rock of Canada, which had two USTs (629 Wellington St.)
17	37	Formerly Capital Commercial Laundry - possible dry cleaning service (80 Ottawa St.)
18	10/28	Formerly an Auto Washing & Oiling Service with two USTs (110 Booth St.)
19	10/28	Formerly Rovale Service Station with one UST (65 Fleet St.)
20	10	Formerly an Auto Radiator Servicing shop (135 Booth St.)
21	10	Formerly the National Brake & Clutch Service (584 Wellington St.)
22	10	Formerly an Oiling & Greasing shop (~181 Booth St.)
23	10/28	Formerly Blair Equipment Ltd. With one UST (48 Fleet St.)
24	10/28	Formerly an Oiling & Greasing shop (703 Wellington St.)
25	28	A spill from a UST occurred here in 2008 (54 Primrose Ave. E.)
26	45	Formerly the Ottawa Paper Box Co. (764 Albert St.)
27	49	Formerly the M. Levinson Salvage Co. (80 Ottawa St.)
28	10	Formerly Queen Auto Service (62 Ottawa St.)
29	34	Formerly Thomas Lawson & Sons Foundry and Machining Shop (~160 Fleet St.)
30	34	Formerly the Ottawa Boiler & Steel Works (158 Fleet St.)
31	49	Formerly the Sachs Brothers Junk Yard (141 Broad St.)
32	34	Formerly the Ottawa Brass Manufacturing Co. (542 Wellington St.)
33	45	Formerly William Freedman - paper industry (unknown address on Wellington St.)
34	33	Formerly Chaudiere Plating Works (137 Booth St.)
35	39	Formerly Ferro Enamels Canada (629 Wellington St.)
36	10	Formerly RCMP Garage (unknown address on Fleet St.)
37	49	Formerly unnamed scrap yard (6 Commissioner St.)
38	45	Formerly Best Boxes Limited / Canada Cheese Box Ltd (unknown address on Fleet St.
39	37	Formerly Therien Co. Limited - rug cleaning and upholstering (118 Fleet St.)

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 25 50 100

1:2,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

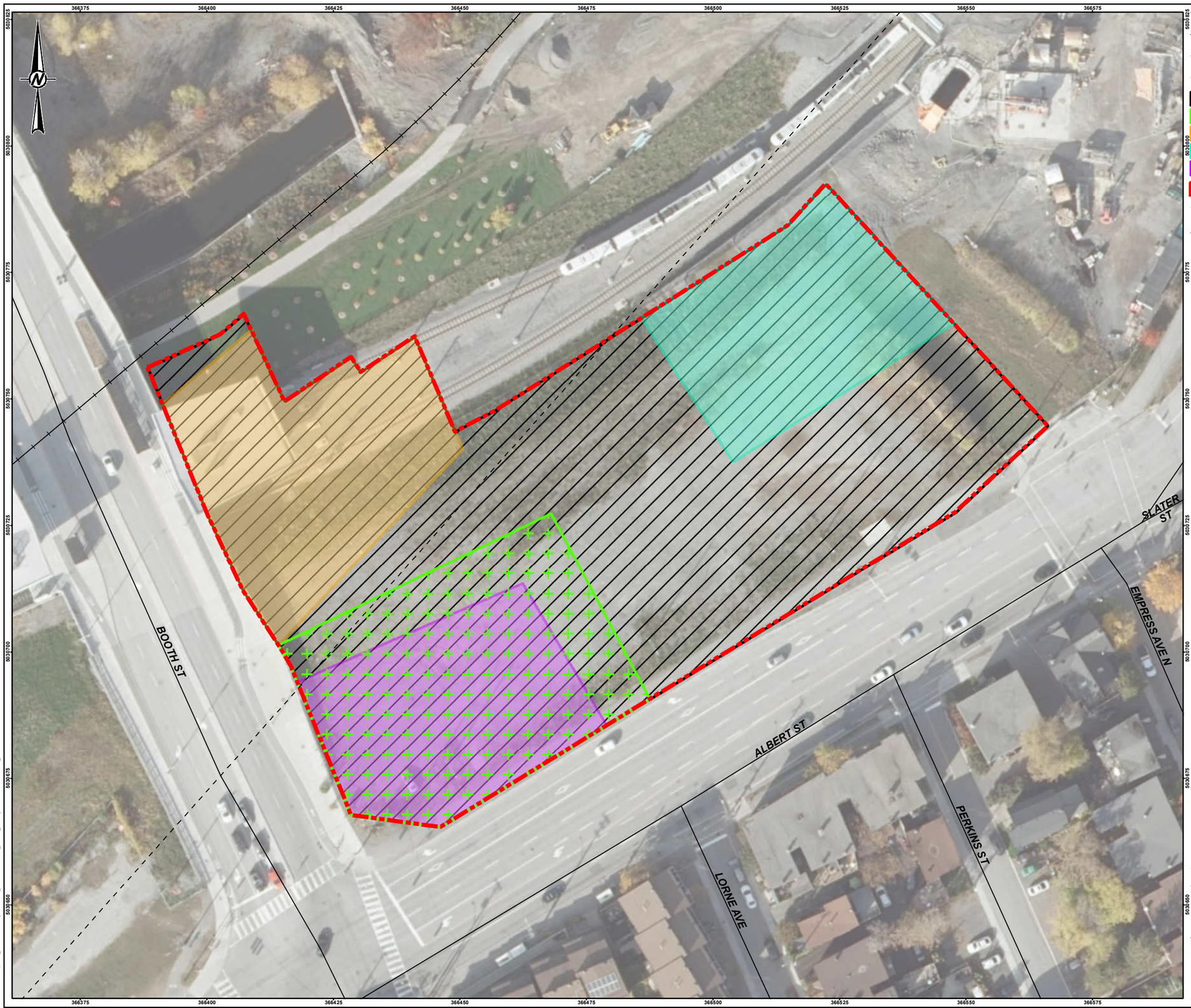
TITLE
SITE PLAN AND POTENTIAL COMTAMINATING ACTIVITIES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-14
DESIGNED	----
PREPARED	JEM
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm



LEGEND

- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- APEC 1: POOR QUALITY FILL
- APEC 2: FORMER POSSIBLE DRY CLEANER
- APEC 3: FORMER INDUSTRIAL PAPER COMPANY
- APEC 4: ADJACENT TO FORMER AUTO SERVICE STATION
- APEC 5: NORTH OF FORMER AUTO SERVICE STATION
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 5 10 20
1:750 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

CONSULTANT
wsp GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	---
PREPARED	JEM
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
0 25mm

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LEGEND

- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION (GOLDER
- APPROXIMATE BOREHOLE LOCATION (GOLDER 2011)
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
BOREHOLE AND MONITORING WELL LOCATION PLAN

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-14
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	**4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
0 25mm

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LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- 9999 GROUNDWATER ELEVATION (mASL)
- GROUNDWATER ELEVATION CONTOUR (mASL)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 10 20 40

1:750 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
GROUNDWATER ELEVATIONS AND FLOW DIRECTION

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-14
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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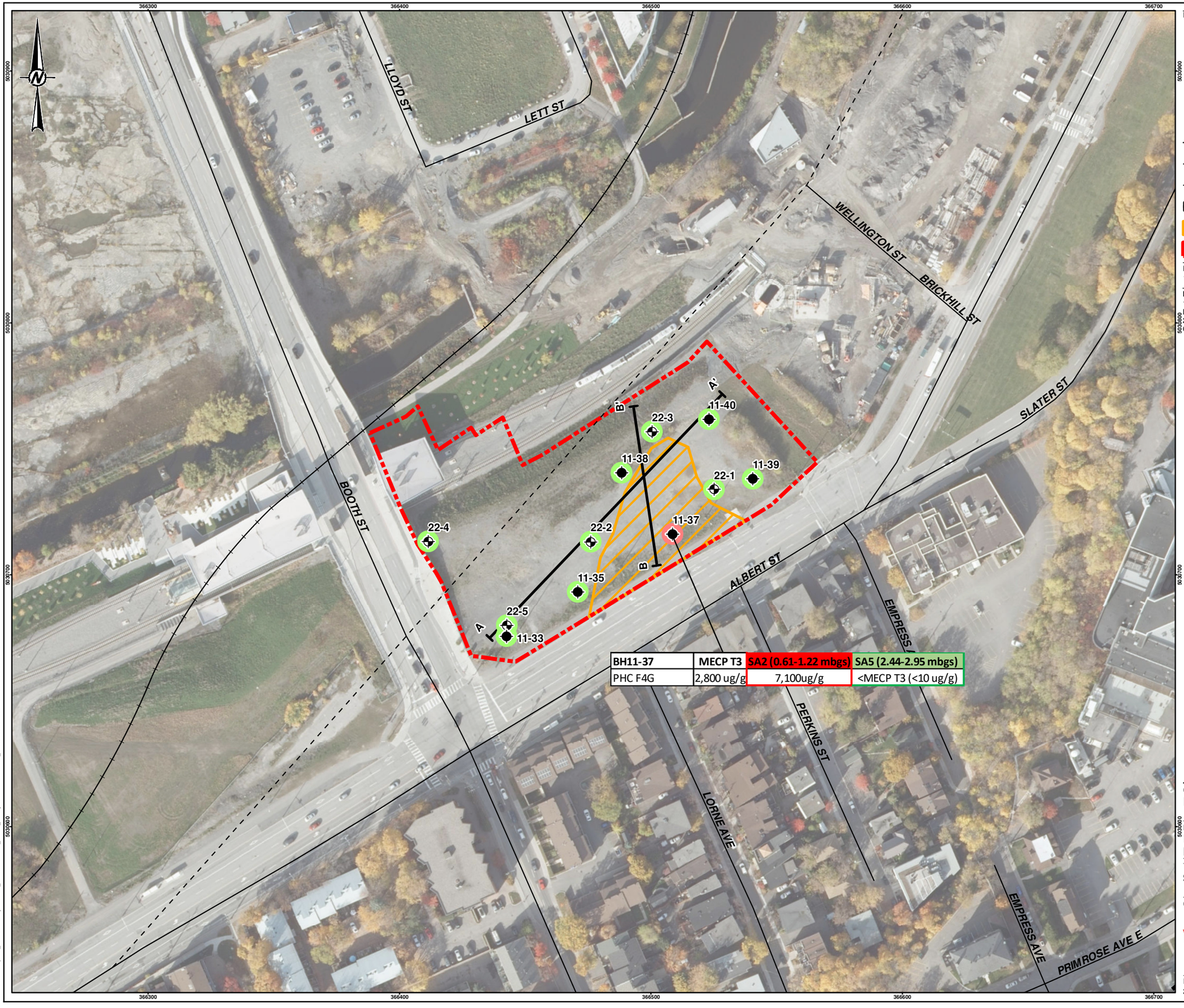

BH11-37	MECP T3	SA2 (0.61-1.22 mbgs)	SA5 (2.44-2.95 mbgs)
PHC F4G	2,800 ug/g	7,100ug/g	<MECP T3 (<10 ug/g)

LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- APPROXIMATE BOREHOLE LOCATION (GOLDER 2011)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ONE OR MORE SAMPLES EXCEED MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- APPROXIMATE CROSS-SECTION LOCATION
- ESTIMATED AREA OF PHC/BTEX EXCEEDANCES
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
SOIL ANALYSIS RESULTS - PHC/BTEX EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-14
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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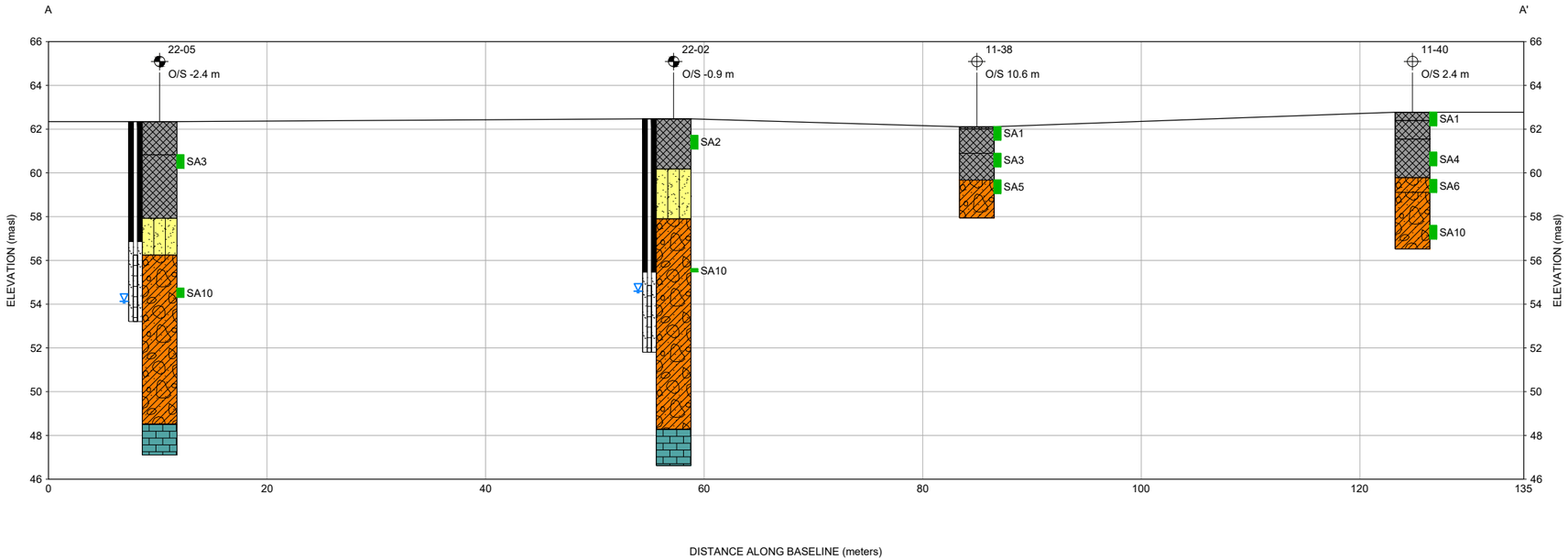
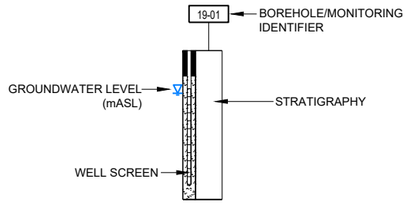


LEGEND

- BOREHOLE, CURRENT INVESTIGATION
- BOREHOLE, PREVIOUS INVESTIGATION



SOIL STRATIGRAPHY

- FILL
- GLACIAL TILL
- SILTY SAND AND GRAVEL
- LIMESTONE

ANALYTICAL LEGEND

- SAMPLE ANALYZED - MEETS SOIL STANDARDS.

0 5 10
1:250 VERTICAL METRES

0 10 20
1:500 HORIZONTAL METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' (PHC/BTEX EXCEEDANCES IN SOIL)

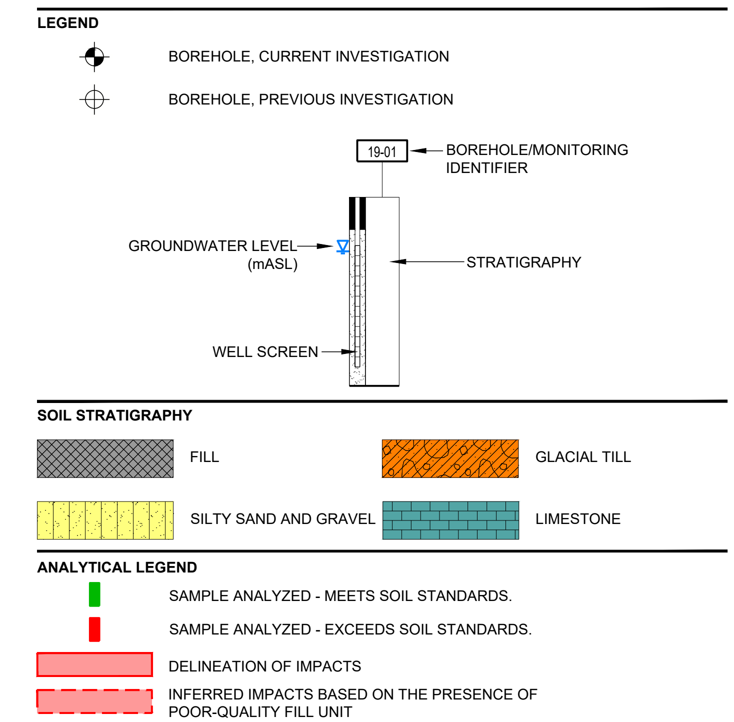
CONSULTANT
GOLDER

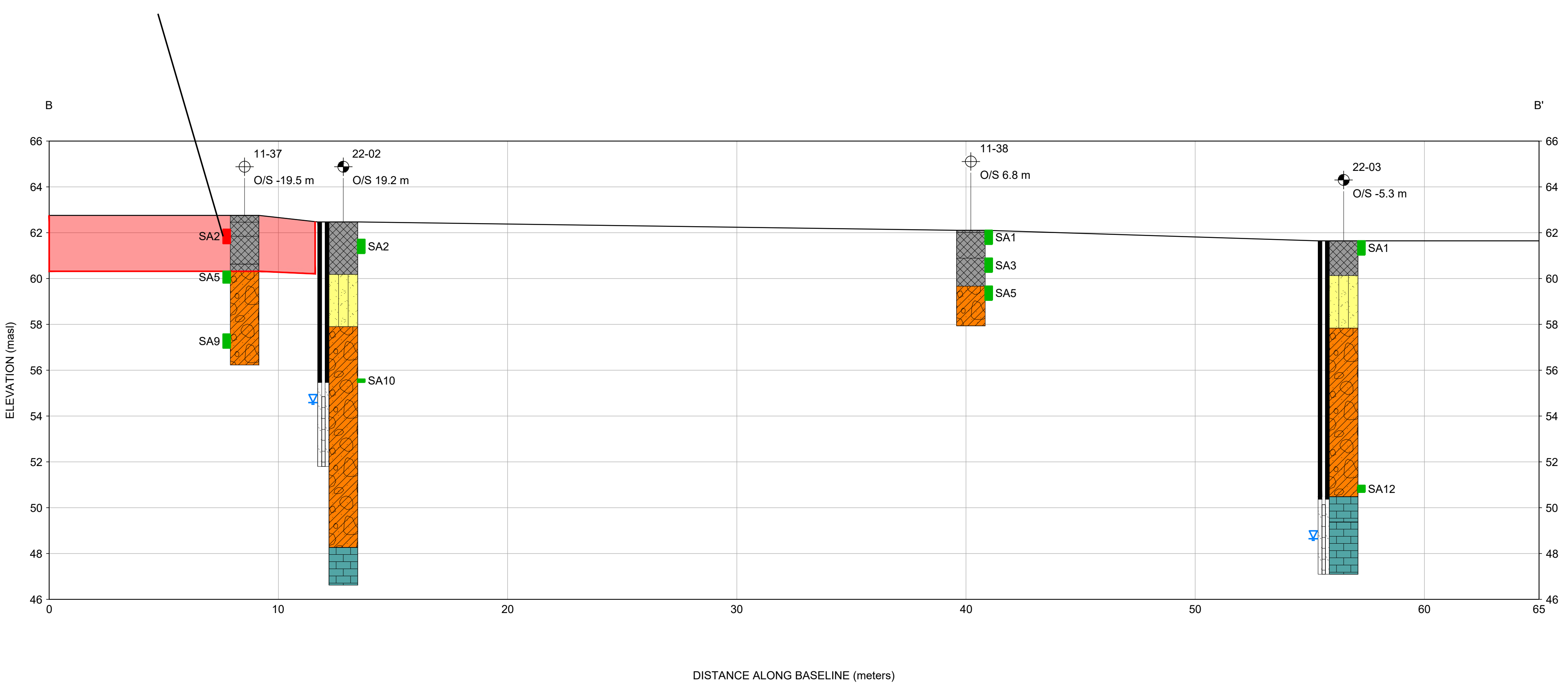
YYYY-MM-DD	2022-03-10
DESIGNED	----
PREPARED	ZS
REVIEWED	KPH
APPROVED	SM

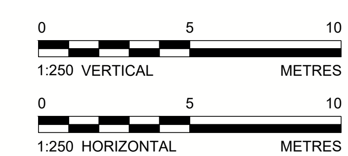
PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	6A

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

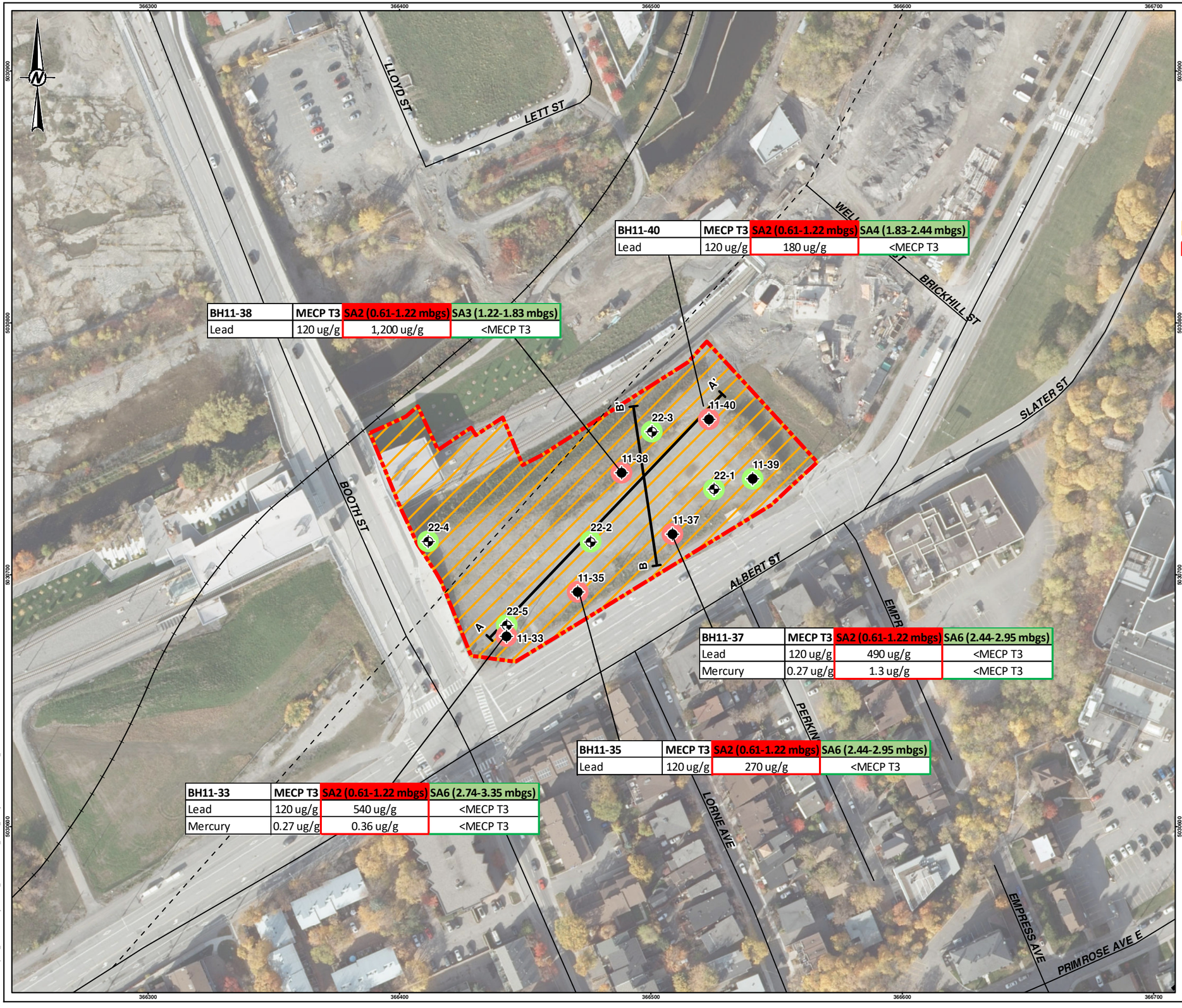
25 mm 0


LEGEND
BOREHOLE, CURRENT INVESTIGATION
BOREHOLE, PREVIOUS INVESTIGATION
19-01
BOREHOLE/MONITORING IDENTIFIER
GROUNDWATER LEVEL (mASL)
STRATIGRAPHY
WELL SCREEN
SOIL STRATIGRAPHY
FILL
GLACIAL TILL
SILTY SAND AND GRAVEL
LIMESTONE
ANALYTICAL LEGEND
SAMPLE ANALYZED - MEETS SOIL STANDARDS.
SAMPLE ANALYZED - EXCEEDS SOIL STANDARDS.
DELINEATION OF IMPACTS
INFERRED IMPACTS BASED ON THE PRESENCE OF POOR-QUALITY FILL UNIT





CLIENT	DREAM
PROJECT	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO
TITLE	**CROSS-SECTION B-B' (PHC/BTEX EXCEEDANCES IN SOIL)**
CONSULTANT	WSP GOLDER
YYYY-MM-DD	2022-03-10
DESIGNED	----
PREPARED	ZS
REVIEWED	KPH
APPROVED	SM
PROJECT NO.	22511882
CONTROL	0002
REV.	0
FIGURE	6B



LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- APPROXIMATE BOREHOLE LOCATION (GOLDER 2011)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ONE OR MORE SAMPLES EXCEED MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- APPROXIMATE CROSS-SECTION LOCATION
- AREA OF METAL EXCEEDANCES
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
SOIL ANALYSIS RESULTS - METAL EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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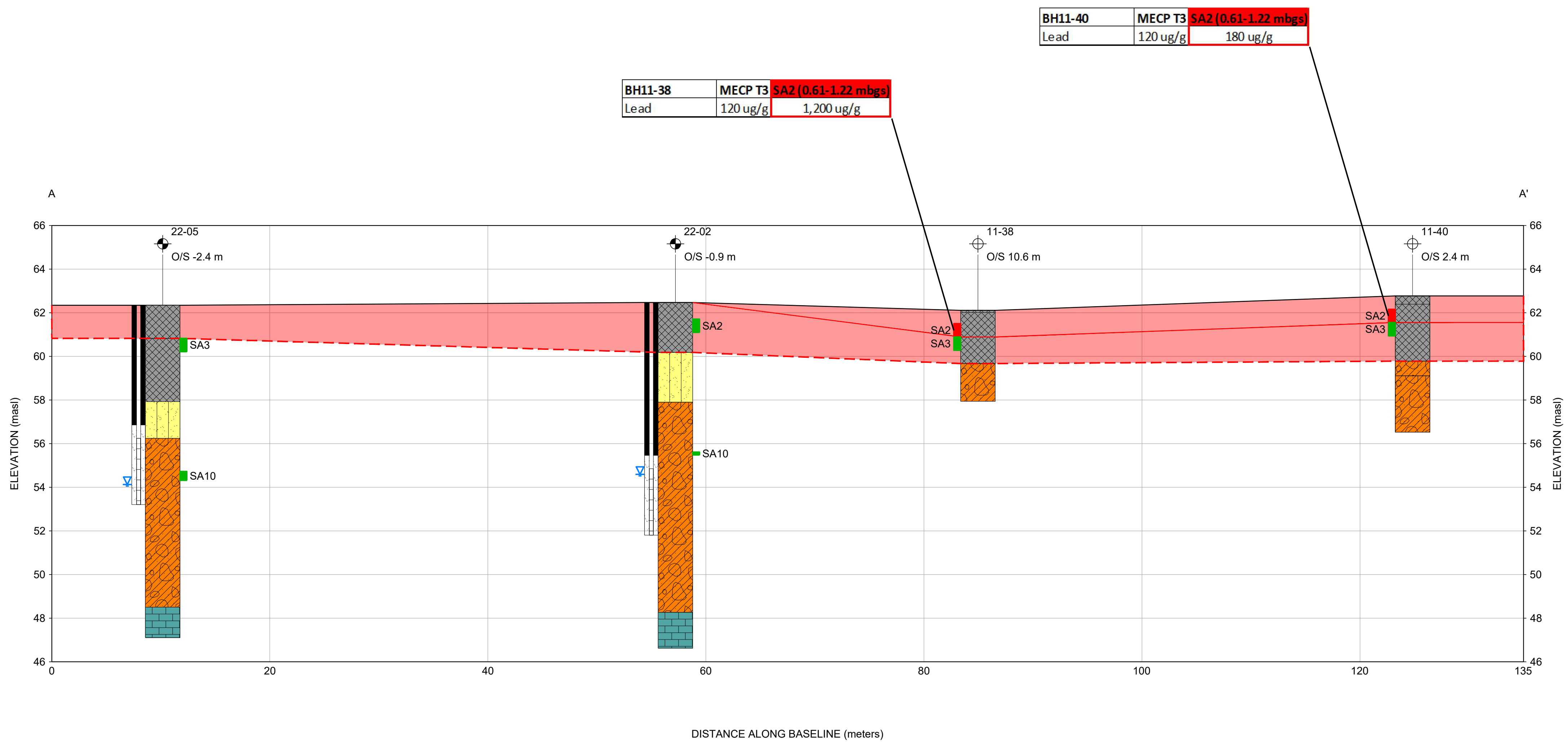


LEGEND

BOREHOLE, CURRENT INVESTIGATION

BOREHOLE, PREVIOUS INVESTIGATION

19-01 ← BOREHOLE/MONITORING IDENTIFIER

GROUNDWATER LEVEL (mASL)

STRATIGRAPHY

WELL SCREEN

SOIL STRATIGRAPHY

FILL

GLACIAL TILL

SILTY SAND AND GRAVEL

LIMESTONE

ANALYTICAL LEGEND

SAMPLE ANALYZED - MEETS SOIL STANDARDS.

SAMPLE ANALYZED - EXCEEDS SOIL STANDARDS.

DELINEATION OF IMPACTS

INFERRED IMPACTS BASED ON THE PRESENCE OF POOR-QUALITY FILL UNIT

0 5 10

1:250 VERTICAL METRES

0 10 20

1:500 HORIZONTAL METRES

CLIENT

DREAM

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE

CROSS-SECTION A-A' (METALS EXCEEDANCES IN SOIL)

CONSULTANT

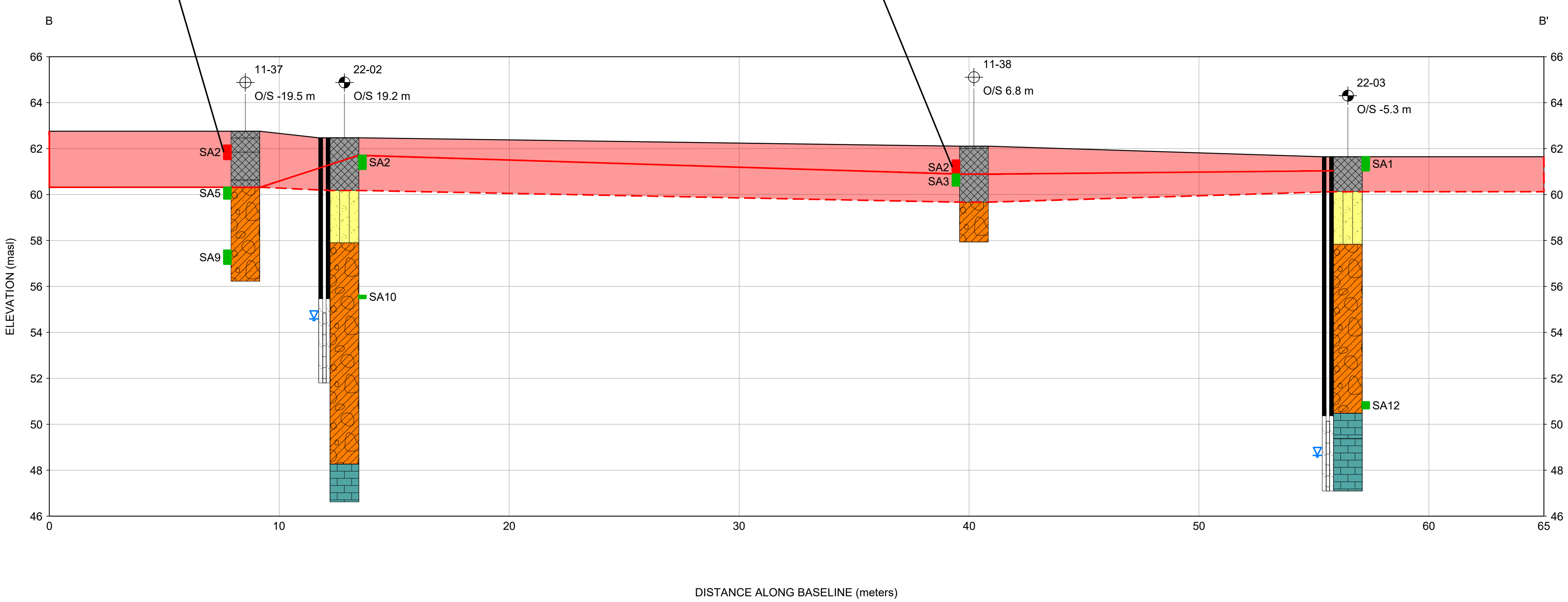
WSP GOLDER

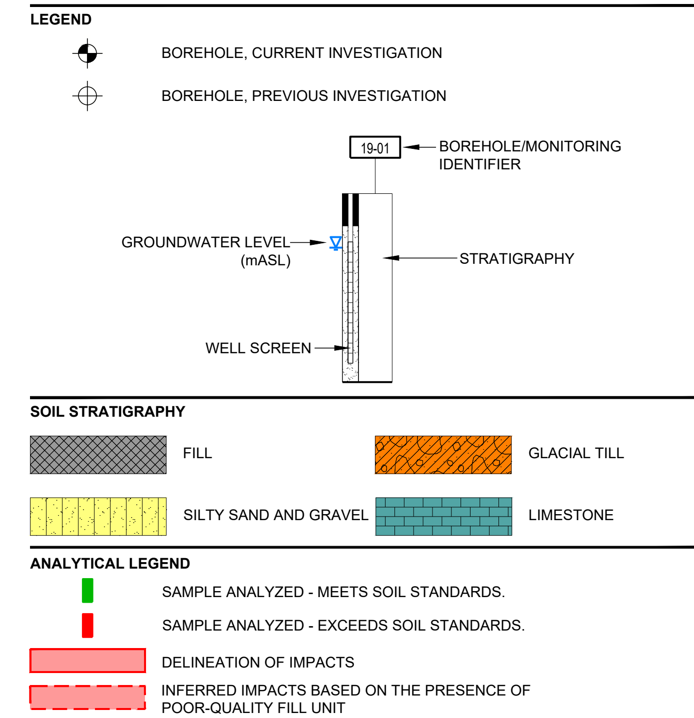
YYYY-MM-DD	2022-03-10
DESIGNED	----
PREPARED	ZS
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	7A

BH11-37	MECP T3	SA2 (0.61-1.22 mbgs)
Lead	120 ug/g	490 ug/g
Mercury	0.27 ug/g	1.3 ug/g

BH11-38	MECP T3	SA2 (0.61-1.22 mbgs)
Lead	120 ug/g	1,200 ug/g





0 5 10
1:250 VERTICAL METRES

0 5 10
1:250 HORIZONTAL METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

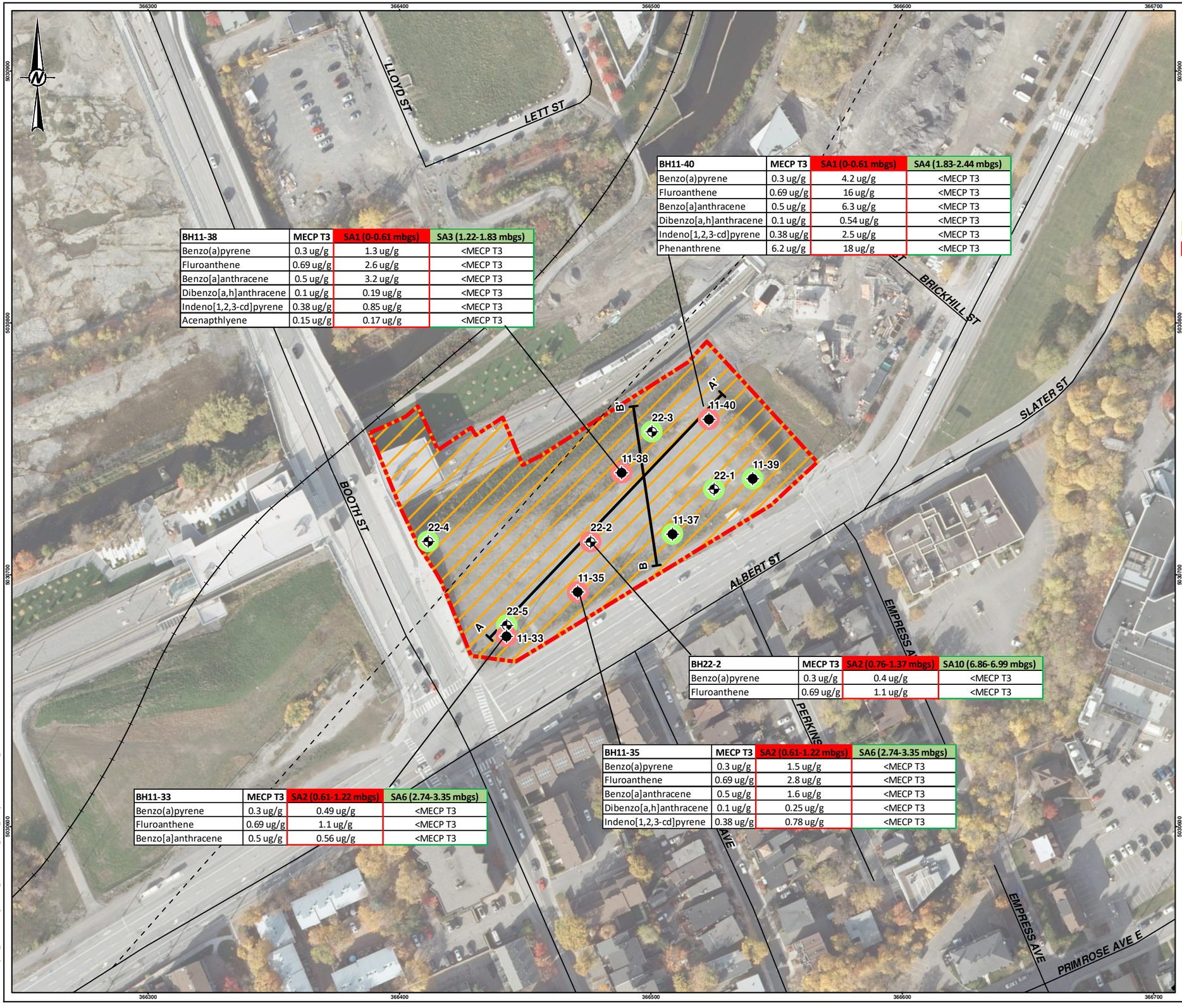
TITLE
CROSS-SECTION B-B' (METALS EXCEEDANCES IN SOIL)

CONSULTANT

WSP GOLDER

YYYY-MM-DD	2022-03-10
DESIGNED	----
PREPARED	ZS
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	7B



BH11-38	MECP T3	SA1 (0-0.61 mbgs)	SA3 (1.22-1.83 mbgs)
Benzo(a)pyrene	0.3 ug/g	1.3 ug/g	<MECP T3
Fluroanthene	0.69 ug/g	2.6 ug/g	<MECP T3
Benzo[a]anthracene	0.5 ug/g	3.2 ug/g	<MECP T3
Dibenzo[a,h]anthracene	0.1 ug/g	0.19 ug/g	<MECP T3
Indeno[1,2,3-cd]pyrene	0.38 ug/g	0.85 ug/g	<MECP T3
Acenapthlyene	0.15 ug/g	0.17 ug/g	<MECP T3

BH11-40	MECP T3	SA1 (0-0.61 mbgs)	SA4 (1.83-2.44 mbgs)
Benzo(a)pyrene	0.3 ug/g	4.2 ug/g	<MECP T3
Fluroanthene	0.69 ug/g	16 ug/g	<MECP T3
Benzo[a]anthracene	0.5 ug/g	6.3 ug/g	<MECP T3
Dibenzo[a,h]anthracene	0.1 ug/g	0.54 ug/g	<MECP T3
Indeno[1,2,3-cd]pyrene	0.38 ug/g	2.5 ug/g	<MECP T3
Phenanthrene	6.2 ug/g	18 ug/g	<MECP T3

BH22-2	MECP T3	SA2 (0.76-1.37 mbgs)	SA10 (6.86-6.99 mbgs)
Benzo(a)pyrene	0.3 ug/g	0.4 ug/g	<MECP T3
Fluroanthene	0.69 ug/g	1.1 ug/g	<MECP T3

BH11-35	MECP T3	SA2 (0.61-1.22 mbgs)	SA6 (2.74-3.35 mbgs)
Benzo(a)pyrene	0.3 ug/g	1.5 ug/g	<MECP T3
Fluroanthene	0.69 ug/g	2.8 ug/g	<MECP T3
Benzo[a]anthracene	0.5 ug/g	1.6 ug/g	<MECP T3
Dibenzo[a,h]anthracene	0.1 ug/g	0.25 ug/g	<MECP T3
Indeno[1,2,3-cd]pyrene	0.38 ug/g	0.78 ug/g	<MECP T3

BH11-33	MECP T3	SA2 (0.61-1.22 mbgs)	SA6 (2.74-3.35 mbgs)
Benzo(a)pyrene	0.3 ug/g	0.49 ug/g	<MECP T3
Fluroanthene	0.69 ug/g	1.1 ug/g	<MECP T3
Benzo[a]anthracene	0.5 ug/g	0.56 ug/g	<MECP T3

LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- APPROXIMATE BOREHOLE LOCATION (GOLDER 2011)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ONE OR MORE SAMPLES EXCEED MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- APPROXIMATE CROSS-SECTION LOCATION
- AREA OF PAH EXCEEDANCES
- PHASE TWO SITE

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60
1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
SOIL ANALYSIS RESULTS - PAH EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-14
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	8

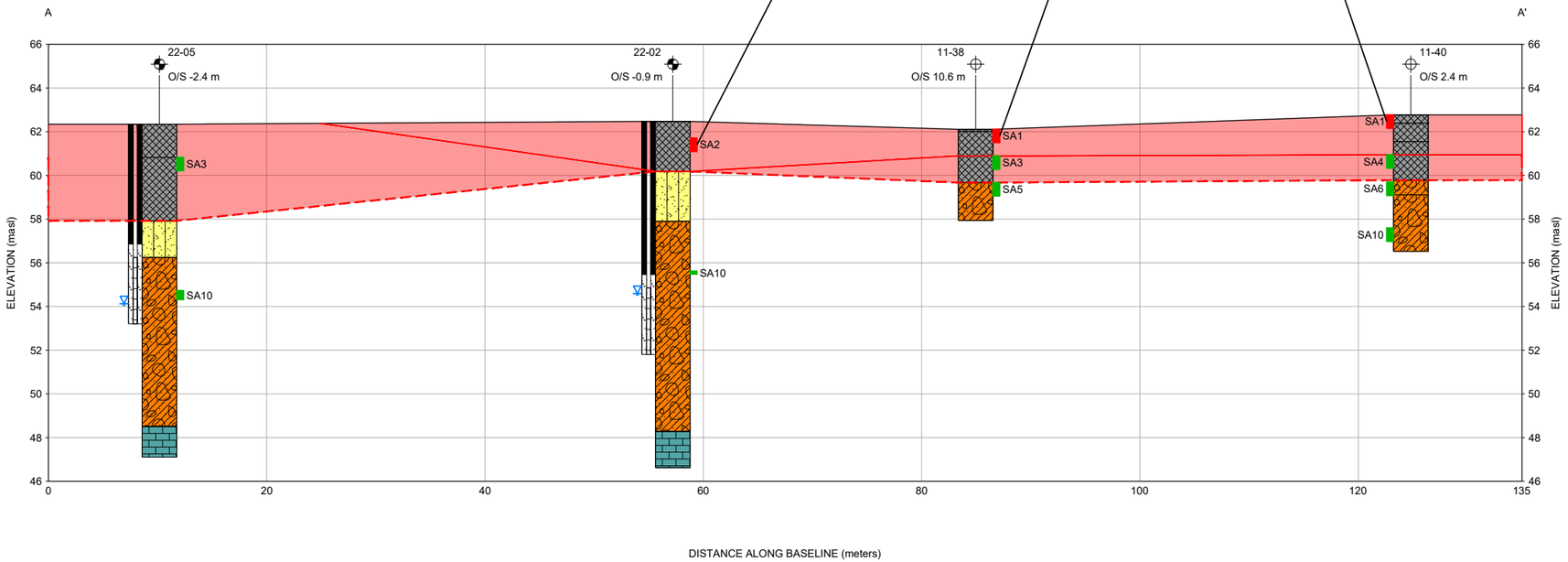
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
0 25mm

Path: N:\Active\Spatial_IM\NCC\LibraryParcel\gis_PROJ-22511882_Dream_LibraryParcel\Lebreton\0002_PhaseTwoESA\22511882-0002-HS-0008.mxd

BH11-38	MECP T3	SA1 (0-0.61 mbgs)
Benzo(a)pyrene	0.3 ug/g	1.3 ug/g
Fluroanthene	0.69 ug/g	2.6 ug/g
Benzo[a]anthracene	0.5 ug/g	3.2 ug/g
Dibenzo[a,h]anthracene	0.1 ug/g	0.19 ug/g
Indeno[1,2,3-cd]pyrene	0.38 ug/g	0.85 ug/g
Acenapthlyene	0.15 ug/g	0.17 ug/g

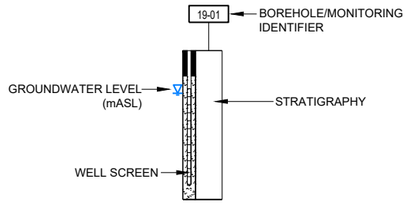
BH11-40	MECP T3	SA1 (0-0.61 mbgs)
Benzo(a)pyrene	0.3 ug/g	4.2 ug/g
Fluroanthene	0.69 ug/g	16 ug/g
Benzo[a]anthracene	0.5 ug/g	6.3 ug/g
Dibenzo[a,h]anthracene	0.1 ug/g	0.54 ug/g
Indeno[1,2,3-cd]pyrene	0.38 ug/g	2.5 ug/g
Phenanthrene	6.2 ug/g	18 ug/g

BH22-2	MECP T3	SA2 (0.76-1.37 mbgs)
Benzo(a)pyrene	0.3 ug/g	0.4 ug/g
Fluroanthene	0.69 ug/g	1.1 ug/g



LEGEND

- BOREHOLE, CURRENT INVESTIGATION
- BOREHOLE, PREVIOUS INVESTIGATION



SOIL STRATIGRAPHY

- FILL
- GLACIAL TILL
- SILTY SAND AND GRAVEL
- LIMESTONE

ANALYTICAL LEGEND

- SAMPLE ANALYZED - MEETS SOIL STANDARDS.
- SAMPLE ANALYZED - EXCEEDS SOIL STANDARDS.
- DELINEATION OF IMPACTS
- INFERRED IMPACTS BASED ON THE PRESENCE OF POOR-QUALITY FILL UNIT

1:250 VERTICAL METRES (0, 5, 10)

1:500 HORIZONTAL METRES (0, 10, 20)

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
CROSS-SECTION A-A' (PAH EXCEEDANCES IN SOIL)

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-10
DESIGNED	----
PREPARED	ZS
REVIEWED	KPH
APPROVED	SM

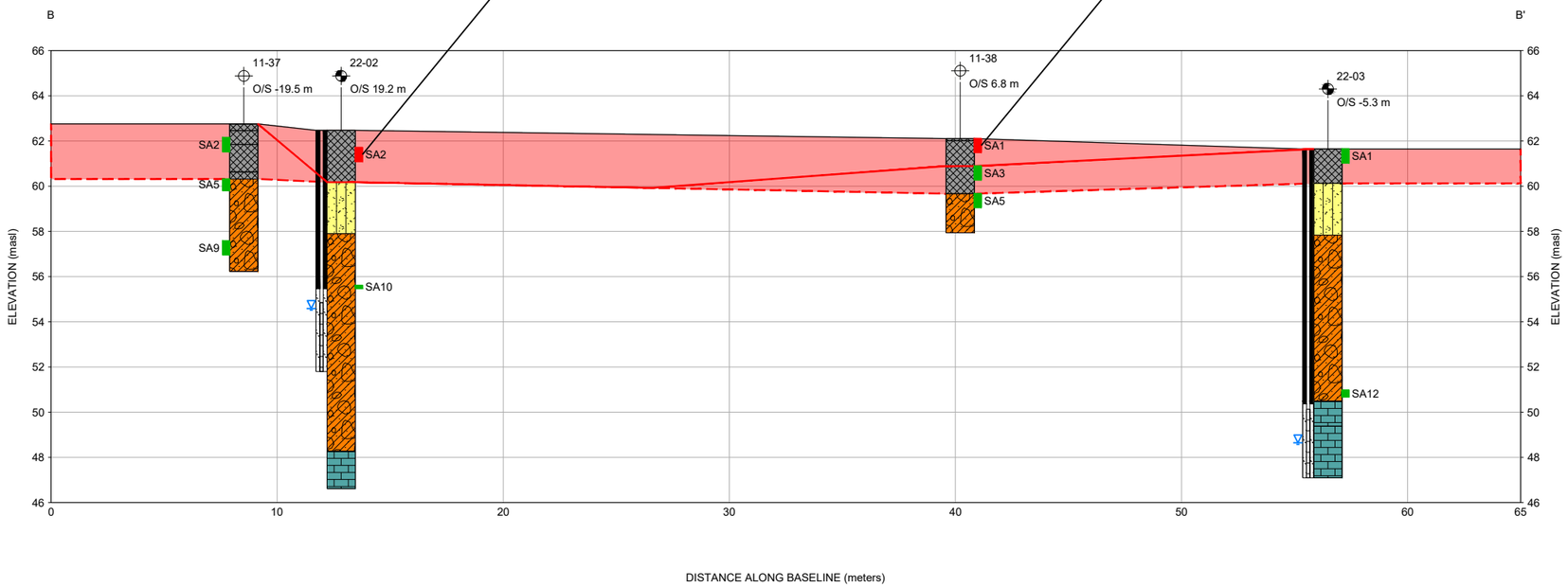
PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	8A

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

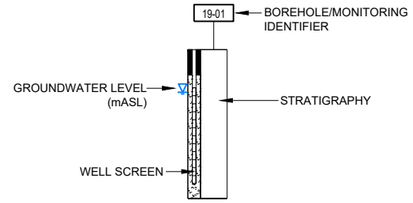
BH22-2	MECP T3	SA2 (0.76-1.37 mbgs)
Benzo(a)pyrene	0.3 ug/g	0.4 ug/g
Fluroanthene	0.69 ug/g	1.1 ug/g

BH11-38	MECP T3	SA1 (0-0.61 mbgs)
Benzo(a)pyrene	0.3 ug/g	1.3 ug/g
Fluroanthene	0.69 ug/g	2.6 ug/g
Benzo[a]anthracene	0.5 ug/g	3.2 ug/g
Dibenzo[a,h]anthracene	0.1 ug/g	0.19 ug/g
Indeno[1,2,3-cd]pyrene	0.38 ug/g	0.85 ug/g
Acenapthlyene	0.15 ug/g	0.17 ug/g



LEGEND

- BOREHOLE, CURRENT INVESTIGATION
- BOREHOLE, PREVIOUS INVESTIGATION



SOIL STRATIGRAPHY

- FILL
- GLACIAL TILL
- SILTY SAND AND GRAVEL
- LIMESTONE

ANALYTICAL LEGEND

- SAMPLE ANALYZED - MEETS SOIL STANDARDS.
- SAMPLE ANALYZED - EXCEEDS SOIL STANDARDS.
- DELINEATION OF IMPACTS
- INFERRED IMPACTS BASED ON THE PRESENCE OF POOR-QUALITY FILL UNIT

0 5 10
1:250 VERTICAL METRES

0 5 10
1:250 HORIZONTAL METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
CROSS-SECTION B-B' (PAH EXCEEDANCES IN SOIL)

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-10
DESIGNED	----
PREPARED	ZS
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	8B

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

0

LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- APPROXIMATE BOREHOLE LOCATION (GOLDER 2011)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECT: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
SOIL ANALYSIS RESULTS - VOC EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
GROUNDWATER ANALYSIS RESULTS - PHC/BTEX EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	**10**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 25mm

Path: N:\Active\Spatial_MMCC\Library\Parcel\99_PRO\22511882_Dream_Library\Parcel\Lebreton\0002_PhaseTwoESA\22511882-0002-HS-001.mxd

LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
GROUNDWATER ANALYSIS RESULTS - METAL EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 25mm

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LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
GROUNDWATER ANALYSIS RESULTS - PAH EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-14
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	12

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

Path: N:\Active\Spatial_MMCC\Library\Parcel\09_PRO\22511882_Dream_Library\Parcel\Lebreton\0002_PhaseTwoESA\22511882-0002-HS-0012.mxd

LEGEND

- APPROXIMATE MONITORING WELL LOCATION (GOLDER 2022)
- ALL SAMPLES MEET MECP TABLE 3 RESIDENTIAL STANDARDS
- ROADWAY
- FORMER ROADWAY (WELLINGSTON STREET)
- FORMER RAILWAY
- PHASE TWO SITE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60

1:1,500 METRES

CLIENT
DREAM

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LEBRETON LIBRARY PARCEL, OTTAWA, ONTARIO

TITLE
GROUNDWATER ANALYSIS RESULTS - VOC EXCEEDANCES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-11
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	KPH
APPROVED	SM

PROJECT NO.	CONTROL	REV.	FIGURE
22511882	0002	0	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: N:\Active\Spatial_MMCC\Library\Parcel\09_PRO\22511882_Dream_Library\Parcel\Lebreton\0002_PhaseTwoESA\22511882-0002-HS-0013.mxd

APPENDIX A

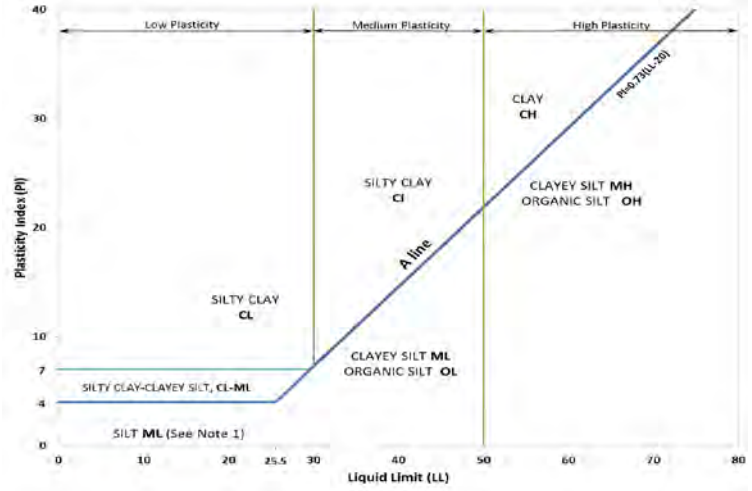
Record of Boreholes

METHOD OF SOIL CLASSIFICATION

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil	Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
				Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)	Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
				Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
				Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
			Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
				None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)	Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% **(see Note 2)**	CL	SILTY CLAY
			Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
			Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures							30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat							75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to indicate a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond Drilling
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
GS	Grab Sample
MC	Modified California Samples
MS	Modified Shelby (for frozen soil)
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size (Shelby tube)
TP	Thin-walled, piston – note size (Shelby tube)
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for the effects of overburden pressure.
2. Definition of compactness terms are based on SPT 'N' ranges as provided in Terzaghi, Peck and Mesri (1996). Many factors affect the recorded SPT 'N' value, including hammer efficiency (which may be greater than 60% in automatic trip hammers), overburden pressure, groundwater conditions, and grainsize. As such, the recorded SPT 'N' value(s) should be considered only an approximate guide to the soil compactness. These factors need to be considered when evaluating the results, and the stated compactness terms should not be relied upon for design or construction.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1,2] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.
2. SPT 'N' values should be considered ONLY an approximate guide to consistency; for sensitive clays (e.g., Champlain Sea clays), the N-value approximation for consistency terms does NOT apply. Rely on direct measurement of undrained shear strength or other manual observations.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
$\sigma_1, \sigma_2, \sigma_3$	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
NP	non-plastic
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c′	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$

2 shear strength = (compressive strength)/2

PROJECT: 22511882

RECORD OF BOREHOLE: 22-01

SHEET 1 OF 3

LOCATION: N 5030733.9 ;E 366525.1

BORING DATE: February 14-15, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ (ND = Not Detected) 20 40 60 80 / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ (ND = Not Detected) 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.92						
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - SILTY SAND, trace gravel; brown; compact to dense		0.00	1	AS	-	ND		
1					2	SS	20			
2					3	SS	33	ND		
					4	SS	58	ND		
3					5	SS	43			Bentonite Seal
4					6	SS	72			
5		SILTY SAND to sandy SILT, trace clay and gravel; grey, contains cobbles and boulders (GLACIAL TILL); very dense		58.04 4.88	7	SS	50/ 0.10			
					8	SS	50/ 0.13			
6					9	SS	77/ 0.15			
7					10	SS	50/ 0.05			Silica Sand
					11	SS	64/ 0.15			
8					12	SS	66/ 0.13			Screen
9					13	SS	50/ 0.05			
10					14	SS				
		CONTINUED NEXT PAGE								

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ALB

CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-01

SHEET 2 OF 3

LOCATION: N 5030733.9 ;E 366525.1

BORING DATE: February 14-15, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* 20 40 60 80 / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ *ND = Not Detected* 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp — W — Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---								
10	Power Auger 200 mm Diam. (Hollow Stem)	SILTY SAND to sandy SILT, trace clay and gravel; grey, contains cobbles and boulders (GLACIAL TILL); very dense			14	SS	50/ 0.08			Screen
11					15	SS	50/ 0.10			
					16	SS	50/ 0.10			
12					17	SS	50/ 0.13			
13					18	SS	50/ 0.08			
					19	SS	50/ 0.05			
14				48.21						
		Borehole continued on RECORD OF DRILLHOLE 22-01		14.71						
15										
16										
17										
18										
19										
20										

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF DRILLHOLE: 22-01

SHEET 3 OF 3

LOCATION: N 5030733.9 ;E 366525.1

DRILLING DATE: February 14-15, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Downing Drilling

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD - Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.
		BEDROCK SURFACE		48.21														
15	Rotary Drill / NQ Core	Weathered, thin to medium bedded, grey black LIMESTONE and SHALE		14.71	1													
16				46.46														
		End of Drillhole		16.46														
17		Note(s):																
		1. Water level in screen measured at a depth of 7.78 m (Elev. 55.14 m) on February 25, 2022																
18																		
19																		
20																		
21																		
22																		
23																		
24																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ALB
CHECKED:

MIS-RCK 004 22511882.GPJ GAL-MISS.GDT 4/4/22 ZS

PROJECT: 22511882

RECORD OF BOREHOLE: 22-02

SHEET 1 OF 3

LOCATION: N 5030713.1 ;E 366476.0

BORING DATE: February 16, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ (ND = Not Detected; 20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ (ND = Not Detected; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl; 20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.47						
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - SILTY SAND, trace gravel; brown		0.00	1	AS	-	ND		
1					2	SS	28			
2					3	SS	16			
					4	SS	20	ND		
3				59.42						
		SILTY SAND to sandy SILT, trace gravel, trace clay; grey, contains cobbles and boulders (GLACIAL TILL); very dense		3.05	5	SS	50/ 0.15			Bentonite Seal
4					6	SS	50/ 0.05			
					7	SS	50/ 0.08			
5					8	SS	50/ 0.13			
6					9	SS	50/ 0.10			
7		- Auger Refusal on boulder at 7.44 m depth			10	SS	50/ 0.13			Silica Sand
8										
9					11	SS	50/ 0.10			Screen
10		*CONTINUED NEXT PAGE*								

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ALB

CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-02

SHEET 2 OF 3

LOCATION: N 5030713.1 ;E 366476.0

BORING DATE: February 16, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger 200 mm Diam. (Hollow Stem)	SILTY SAND to sandy SILT, trace gravel, trace clay; grey, contains cobbles and boulders (GLACIAL TILL); very dense									Screen
11					12	SS	50/ 0.03				
12											
13					13	SS	50/ 0.03				
14				48.27							
		Borehole continued on RECORD OF DRILLHOLE 22-02		14.2							
15											
16											
17											
18											
19											
20											

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF DRILLHOLE: 22-02

SHEET 3 OF 3

LOCATION: N 5030713.1 ;E 366476.0

DRILLING DATE: February 16, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Downing Drilling

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD - Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.
		BEDROCK SURFACE		48.27														
15	Rotary Drill / NQ Core	Grey, thin to medium bedded LIMESTONE and SHALE		14.20	1													
				46.62														
16		End of Drillhole		15.85														
		Note(s):																
		1. Water level in screen measured at a depth of 7.88 m (Elev. 54.59 m) on February 25, 2022																
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-03

SHEET 1 OF 3

LOCATION: N 5030756.8 ;E 366500.4

BORING DATE: February 22, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ (ND = Not Detected; 20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ (ND = Not Detected; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl; 20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		61.65						
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - SILTY SAND, trace gravel and brick; brown		0.00	1	AS	-	ND		
1					2	SS	8			
2					3	SS	11	ND		
				59.36						
		SILTY SAND to sandy SILT, trace gravel; grey, contains cobbles and boulders (GLACIAL TILL); very dense		2.29	4	SS	43	ND		
3					5	SS	58			
4					6	SS	50/ 0.10	ND		
					7	SS	50/ 0.10			Bentonite Seal
5					8	SS	50/ 0.08			
6					9	SS	50/ 0.08			
7					10	SS	50/ 0.05			
8										
9					11	SS	50/ 0.08	ND		
10		*CONTINUED NEXT PAGE*								

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ALB
CHECKED:

MIS-BHS 001 22511882.GPJ GAL-MIS.GDT 4/4/22 ZS

PROJECT: 22511882

RECORD OF BOREHOLE: 22-03

SHEET 2 OF 3

LOCATION: N 5030756.8 ;E 366500.4

BORING DATE: February 22, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									
10	Power Auger 200 mm Diam. (Hollow Stem)	SILTY SAND to sandy SILT, trace gravel; grey, contains cobbles and boulders (GLACIAL TILL); very dense			12	SS	61/ 0.15				Bentonite Seal
11				50.48 / 11.17							
		Borehole continued on RECORD OF DRILLHOLE 22-03									
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE
1 : 50

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF DRILLHOLE: 22-03

SHEET 3 OF 3

LOCATION: N 5030756.8 ;E 366500.4

DRILLING DATE: February 22, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Downing Drilling

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD - Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH / COLOUR % RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	
		BEDROCK SURFACE		50.48															
12	Rotary Drill / NQ Core	Slightly weathered to fresh, thin to medium bedded, grey black LIMESTONE and SHALE		11.17	1														Bentonite Seal Silica Sand
				49.38															
13		Fresh, thin to medium bedded, grey to black LIMESTONE and SHALE		12.27	2														Screen
14					3														
				47.10															
15		End of Drillhole Note(s): 1. Water level in screen measured at a depth of 13.00 m (Elev. 48.65 m) on February 25, 2022		14.55															

DEPTH SCALE
1 : 50

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-04

SHEET 1 OF 3

LOCATION: N 5030713.2 ;E 366411.4

BORING DATE: February 23, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		60.47							
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - SILTY SAND, trace gravel; brown		0.00	1	AS	-				
1					2	SS	10				
2					3	SS	6				
				58.34							
		SILTY SAND to sandy SILT, trace gravel, trace clay; (possibly till); loose to compact		2.13	4	SS	8				
3					5	SS	8				Bentonite Seal
4					6	SS	16				
5					7	SS	7				
					8	SS	14				
6				54.37							
		SILTY SAND to sandy SILT, trace gravel, trace clay; grey, contains cobbles and boulders (GLACIAL TILL); dense to very dense		6.10	9	SS	27				
7											Silica Sand
8					10	SS	78				
9											Screen
					11	SS	47				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ALB

CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-04

SHEET 2 OF 3

LOCATION: N 5030713.2 ;E 366411.4

BORING DATE: February 23, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									
10	Power Auger 200 mm Diam. (Hollow Stem)	SILTY SAND to sandy SILT, trace gravel, trace clay; grey, contains cobbles and boulders (GLACIAL TILL); dense to very dense			12	SS	50/ 0.05				Screen; Silica Sand
11				49.29							
		Borehole continued on RECORD OF DRILLHOLE 22-04		11.18							
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE
1 : 50

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF DRILLHOLE: 22-04

SHEET 3 OF 3

LOCATION: N 5030713.2 ;E 366411.4

DRILLING DATE: February 23, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Downing Drilling

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD - Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.
		BEDROCK SURFACE		49.29														
12	Rotary Drill / NQ Core	Fresh, thin to medium bedded, grey black LIMESTONE and SHALE		11.18	1													
				48.28														
13		End of Drillhole Note(s): 1. Water level in screen measured at a depth of 10.70 m (Elev. 49.77 m) on February 25, 2022		12.19														
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		

DEPTH SCALE
1 : 50

LOGGED: ALB
CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-05

SHEET 1 OF 3

LOCATION: N 5030679.9 ;E 366442.7

BORING DATE: February 24, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ (ND = Not Detected) 20 40 60 80	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ (ND = Not Detected) 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.34								
0	Power Auger 200 mm Diam. (Hollow Stem)	FILL - SILTY SAND, trace gravel; brown		0.00	1	AS	-	ND				Bentonite Seal
1					2	SS	33					
2					3	SS	31					
					4	SS	84					
3				59.29								
		SILTY SAND to sandy SILT, trace gravel, trace clay; grey, contains cobbles and boulders (GLACIAL TILL); very dense		3.05	5	SS	94					
4					6	SS	50	ND				
					7	SS	50/ 0.05					
5					8	SS	50/ 0.03					Silica Sand
6					9	SS	50/ 0.05					
7												Screen
8					10	SS	50/ 0.10	ND				
9					11	SS	50/ 0.13					
10		*CONTINUED NEXT PAGE*										

DEPTH SCALE

1 : 50

LOGGED: ALB

CHECKED:

PROJECT: 22511882

RECORD OF BOREHOLE: 22-05

SHEET 2 OF 3

LOCATION: N 5030679.9 ;E 366442.7

BORING DATE: February 24, 2022

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.30m	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (20 40 60 80) / HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger 200 mm Diam. (Hollow Stem)	SILTY SAND to sandy SILT, trace gravel, trace clay; grey, contains cobbles and boulders (GLACIAL TILL); very dense			12	SS	50/ 0.13				
11											
12					13	SS	86				
13											
				48.50	14	SS	50/ 0.13				
14		Borehole continued on RECORD OF DRILLHOLE 22-05		13.84							
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: ALB

CHECKED:

PROJECT: 22511882

RECORD OF DRILLHOLE: 22-05

SHEET 3 OF 3

LOCATION: N 5030679.9 ;E 366442.7

DRILLING DATE: February 24, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Downing Drilling

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD - Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.
		BEDROCK SURFACE		48.50														
14	Rotary Drill / NQ Core	Slightly weathered to fresh, thin to medium bedded, grey black LIMESTONE and SHALE		13.84	1													
15				47.10														
		End of Drillhole Note(s): 1. Water level in screen measured at a depth of 8.22 m (Elev. 54.12 m) on February 25, 2022		15.24														
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		

DEPTH SCALE
1 : 50

LOGGED: ALB
CHECKED:

PROJECT: 11-1122-0199

RECORD OF BOREHOLE: 11-33

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 8, 2011

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.22							
0	Power Auger 200 mm Diam. (Hollow Stem)	Dense dark grey crushed stone (Gravel lot BASE)		0.08	1	50 DO	46				
		Dense brown fine to medium sand, some coarse sand, some gravel, trace silt (Gravel lot SUBBASE)		61.69 0.53							
1		Loose to very dense dark brown silty sand, trace to some gravel, brick, wood, organics, concrete, occasional grey silty clay layer (FILL)			2	50 DO	9				
					3	50 DO	60				
2					4	50 DO	12				
					5	50 DO	56				
				59.32							
3		Compact to very dense brown to grey brown SILTY SAND to SANDY SILT, trace to some gravel (GLACIAL TILL)		2.90	6	50 DO	23				
					7	50 DO	48				
4					8	50 DO	74				
					9	50 DO	49				
5					10	50 DO	55				
					11	50 DO	>89				
6					12	50 DO	>100				
					13	50 DO	>100				
7					14	50 DO	>100				
				54.60							
		Very dense grey brown SILTY SAND, trace to some gravel, occasional grey silt seam, occasional fine to medium sand seam (GLACIAL TILL)		7.62	15	50 DO	>111				
8					16	50 DO	>105				
					17	50 DO	>50				
9					18	50 DO	>100				
					19	50 DO	>50				
					20	50 DO	>110				
				52.26							
10		End of Borehole Split Spoon Refusal		9.96							
11											

DEPTH SCALE

1 : 55

LOGGED: RI

CHECKED: GDC

Golder Associates

MIS-BHS 001 1111220199.GPJ GAL-MIS.GDT 02/24/15 JEM

PROJECT: 11-1122-0199

RECORD OF BOREHOLE: 11-35

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 12, 2011

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.56							
0	Power Auger 200 mm Diam. (Hollow Stem)	Dense grey sand and gravel (Gravel lot BASE)		0.00							
				62.25	1	50 DO	52				
		Compact brown medium to fine sand, trace gravel (Gravel lot SUBBASE)		0.31							
				61.65	2	50 DO	17				
1		Compact dark brown to black silty sand, trace gravel, ash, wood, brick, mortar (FILL)		0.91							
					3	50 DO	19				
				60.88							
		Compact brown fine to medium sand, trace gravel (FILL)		1.68	4	50 DO	24				
2				60.43							
		Dense to very dense light brown to brown SILTY SAND, occasional gravel and medium sand layers, trace gravel (GLACIAL TILL)		2.13	5	50 DO	45				
					6	50 DO	65				
3					7	50 DO	176				
4					8	50 DO	>50				
				58.16							
		End of Borehole Auger Refusal		4.40							
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BM

CHECKED: GDC

MIS-BHS 001 1111220199.GPJ GAL-MIS.GDT 02/24/15 JEM

PROJECT: 11-1122-0199

RECORD OF BOREHOLE: 11-37

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 12, 2011

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.76							
0	Power Auger 200 mm Diam. (Hollow Stem)	Compact sand and gravel (Gravel lot BASE)		0.00							
				62.46	1	50 DO	29				
		Compact brown medium to fine sand, trace gravel (Gravel lot SUBBASE)		0.30							
				61.85	2	50 DO	20				
1		Loose dark brown to black silty sand, trace gravel, occasional layers of ash, gravel, sandy mortar, glass, construction debris (FILL)		0.91	3	50 DO	6				
2				60.63	4	50 DO	34				
		Compact brown medium to fine sand, trace gravel (FILL)		2.13							
				60.32							
		Dense to very dense grey brown SILTY SAND, some gravel, trace cobbles (GLACIAL TILL)		2.44	5	50 DO	73				
3					6	50 DO	>75				
4					7	50 DO	>65				
					8	50 DO	>75				
5					9	50 DO	40				
6					10	50 DO	>50				
				56.23							
		End of Borehole Auger Refusal		6.53							
7											
8											
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BM

CHECKED: GDC

MIS-BHS 001 1111220199.GPJ GAL-MIS.GDT 02/24/15 JEM

PROJECT: 11-1122-0199

RECORD OF BOREHOLE: 11-38

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 19, 2011

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.11							
0	Power Auger 200 mm Diam. (Hollow Stem)	Compact to dense brown sand and gravel (Gravel lot BASE)		0.00							
		Loose to compact brown medium to fine sand, some gravel (Gravel lot SUBBASE)		0.10	1	50 DO	35				
1					2	50 DO	8				
				60.89							
		Compact to very dense grey brown sand, some gravel, trace silt (FILL)		1.22	3	50 DO	15				
2					4	50 DO	52				
				59.67							
		Very dense grey brown SILTY SAND, some gravel, medium brown sand seams (GLACIAL TILL)		2.44	5	50 DO	61				
3					6	50 DO	112				
					7	50 DO	148				
4				57.94							
		End of Borehole Auger Refusal		4.17							
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: JDR
CHECKED: GDC

MIS-BHS 001 1111220199.GPJ GAL-MIS.GDT 02/24/15 JEM

PROJECT: 11-1122-0199

RECORD OF BOREHOLE: 11-39

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 15, 2011

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.81							
0	Power Auger 200 mm Diam. (Hollow Stem)	Compact sand and gravel (Gravel lot BASE)		0.00							
		Compact brown to red sandy silt, trace gravel (FILL)		0.15	1	50 DO	15				
				61.90	2	50 DO	20				
1		Compact to dense light brown fine to medium sand, trace gravel, silt, and mortar (FILL)		0.91	3	50 DO	40				
2				60.68	4	50 DO	120				
		Dense sandy gravel to brown fine to medium sand and gravel (FILL)		2.13	5	50 DO	67				
3					6	50 DO	99				
				59.15							
		Compact to very dense grey SILTY SAND, some gravel (GLACIAL TILL)		3.66	7	50 DO	34				
4					8	50 DO	27				
5					9	50 DO	33				
					10	50 DO	>50				
6					11	50 DO	>100				
				56.46	12	50 DO	>100				
		End of Borehole Auger Refusal		6.35							
7											
8											
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BM/JD

CHECKED: GDC

MIS-BHS 001 1111220199.GPJ GAL-MIS.GDT 02/24/15 JEM

PROJECT: 11-1122-0199

RECORD OF BOREHOLE: 11-40

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 16, 2011

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		62.77							
0	Power Auger 200 mm Diam. (Hollow Stem)	Compact red to fine brown sand, some gravel (Gravel lot BASE)		0.00 / 62.39	1	50 DO	13				
		Compact fine to medium brown sand, some gravel, red brick (FILL)		0.38 / 61.55	2	50 DO	19				
1		Compact light brown fine to medium sand, trace gravel, silt, red brick (FILL)		1.22 / 59.78	3	50 DO	15				
					4	50 DO	25				
2					5	50 DO	51				
		Very dense grey brown SAND, some gravel, trace silt (GLACIAL TILL)		2.99 / 59.11	6	50 DO	59				
3		Very dense grey brown SILTY SAND, some gravel (GLACIAL TILL)		3.66	7	50 DO	100				
					8	50 DO	>50				
					9	50 DO	>100				
4											
					10	50 DO	187				
5					11	50 DO	>50				
				56.52							
		End of Borehole Auger Refusal		6.25							
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

LOGGED: JD

CHECKED: GDC

Golder Associates

MIS-BHS 001 1111220199.GPJ GAL-MIS.GDT 02/24/15 JEM

APPENDIX B

Laboratory Certificates of Analysis

Your Project #: 22511882
Site Location: LIBRARY
Your C.O.C. #: 865599-06-01

Attention: Keith Holmes

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2022/03/04
Report #: R7028422
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C251308
Received: 2022/02/25, 14:45

Sample Matrix: Soil
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	11	N/A	2022/03/03	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	11	N/A	2022/03/02		EPA 8260C m
Conductivity (1)	11	2022/03/01	2022/03/01	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1, 2)	11	2022/03/01	2022/03/02	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	11	2022/02/28	2022/03/01	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	1	2022/03/03	2022/03/03	CAM SOP-00316	CCME PHC-CWS m
Acid Extractable Metals by ICPMS (1)	10	2022/03/01	2022/03/02	CAM SOP-00447	EPA 6020B m
Acid Extractable Metals by ICPMS (1)	1	2022/03/02	2022/03/02	CAM SOP-00447	EPA 6020B m
Moisture (1)	11	N/A	2022/02/28	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	11	2022/03/01	2022/03/02	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT (1)	4	2022/03/01	2022/03/01	CAM SOP-00413	EPA 9045 D m
pH CaCl2 EXTRACT (1)	2	2022/03/02	2022/03/02	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR) (1)	11	N/A	2022/03/02	CAM SOP-00102	EPA 6010C
Volatile Organic Compounds and F1 PHCs (1)	11	N/A	2022/03/01	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas 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.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas 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 Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas 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 Bureau Veritas, results relate to the supplied samples tested.

Your Project #: 22511882
Site Location: LIBRARY
Your C.O.C. #: 865599-06-01

Attention: Keith Holmes

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2022/03/04
Report #: R7028422
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C251308

Received: 2022/02/25, 14:45

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 Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8

(2) Soils are reported on a dry weight basis unless otherwise specified.

(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas 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

Katherine Szozda
Project Manager
04 Mar 2022 15:40:57

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		RYK957	RYK958	RYK959	RYK960	RYK961		
Sampling Date		2022/02/14 12:00	2022/02/14 12:00	2022/02/16 12:00	2022/02/16 12:00	2022/02/22 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	**22-1 SA4**	**22-1 SA10**	**22-2 SA2**	**22-2 SA10**	**22-3 SA1**	**RDL**	**QC Batch**
Metals								
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	0.58	<0.20	0.41	0.20	7857371
Acid Extractable Arsenic (As)	ug/g	1.1	<1.0	1.5	<1.0	2.2	1.0	7857371
Acid Extractable Barium (Ba)	ug/g	38	29	87	31	120	0.50	7857371
Acid Extractable Beryllium (Be)	ug/g	0.25	<0.20	0.27	<0.20	0.34	0.20	7857371
Acid Extractable Boron (B)	ug/g	<5.0	<5.0	<5.0	<5.0	7.0	5.0	7857371
Acid Extractable Cadmium (Cd)	ug/g	<0.10	<0.10	0.11	<0.10	0.11	0.10	7857371
Acid Extractable Chromium (Cr)	ug/g	11	8.9	13	12	33	1.0	7857371
Acid Extractable Cobalt (Co)	ug/g	4.4	3.1	4.8	3.8	7.8	0.10	7857371
Acid Extractable Copper (Cu)	ug/g	7.6	8.6	11	8.5	19	0.50	7857371
Acid Extractable Lead (Pb)	ug/g	3.8	2.2	56	3.1	30	1.0	7857371
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	<0.50	0.71	<0.50	0.99	0.50	7857371
Acid Extractable Nickel (Ni)	ug/g	8.1	5.0	8.9	6.8	17	0.50	7857371
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7857371
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7857371
Acid Extractable Thallium (Tl)	ug/g	0.12	<0.050	0.10	0.075	0.15	0.050	7857371
Acid Extractable Uranium (U)	ug/g	0.40	0.52	0.51	0.49	0.63	0.050	7857371
Acid Extractable Vanadium (V)	ug/g	19	17	24	21	28	5.0	7857371
Acid Extractable Zinc (Zn)	ug/g	16	12	34	15	56	5.0	7857371
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	0.20	<0.050	<0.050	0.050	7857371

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		RYK962	RYK963	RYK964	RYK965	RYK966		
Sampling Date		2022/02/22 12:00	2022/02/22 12:00	2022/02/23 12:00	2022/02/23 12:00	2022/02/24 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	**DUP-1**	**22-3 SA12**	**22-4 SA5**	**22-4 SA11**	**22-5 SA3**	**RDL**	**QC Batch**
Metals								
Acid Extractable Antimony (Sb)	ug/g	0.30	<0.20	<0.20	<0.20	<0.20	0.20	7857371
Acid Extractable Arsenic (As)	ug/g	2.1	1.4	1.2	<1.0	<1.0	1.0	7857371
Acid Extractable Barium (Ba)	ug/g	120	130	79	220	61	0.50	7857371
Acid Extractable Beryllium (Be)	ug/g	0.32	0.40	0.26	0.48	<0.20	0.20	7857371
Acid Extractable Boron (B)	ug/g	6.2	8.8	<5.0	<5.0	<5.0	5.0	7857371
Acid Extractable Cadmium (Cd)	ug/g	0.12	<0.10	<0.10	<0.10	<0.10	0.10	7857371
Acid Extractable Chromium (Cr)	ug/g	26	26	17	33	9.4	1.0	7857371
Acid Extractable Cobalt (Co)	ug/g	7.0	5.7	5.6	10	2.6	0.10	7857371
Acid Extractable Copper (Cu)	ug/g	17	51	16	21	5.2	0.50	7857371
Acid Extractable Lead (Pb)	ug/g	28	5.4	14	4.7	7.9	1.0	7857371
Acid Extractable Molybdenum (Mo)	ug/g	0.93	3.2	1.1	0.80	<0.50	0.50	7857371
Acid Extractable Nickel (Ni)	ug/g	16	14	11	21	5.7	0.50	7857371
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7857371
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7857371
Acid Extractable Thallium (Tl)	ug/g	0.16	0.12	0.12	0.23	<0.050	0.050	7857371
Acid Extractable Uranium (U)	ug/g	0.61	0.56	0.59	0.73	0.36	0.050	7857371
Acid Extractable Vanadium (V)	ug/g	26	20	26	47	10	5.0	7857371
Acid Extractable Zinc (Zn)	ug/g	46	41	37	56	14	5.0	7857371
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7857371

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		RYK967		
Sampling Date		2022/02/24 12:00		
COC Number		865599-06-01		
	UNITS	22-5 SA10	RDL	QC Batch
Metals				
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	7859700
Acid Extractable Arsenic (As)	ug/g	<1.0	1.0	7859700
Acid Extractable Barium (Ba)	ug/g	47	0.50	7859700
Acid Extractable Beryllium (Be)	ug/g	<0.20	0.20	7859700
Acid Extractable Boron (B)	ug/g	<5.0	5.0	7859700
Acid Extractable Cadmium (Cd)	ug/g	<0.10	0.10	7859700
Acid Extractable Chromium (Cr)	ug/g	13	1.0	7859700
Acid Extractable Cobalt (Co)	ug/g	7.2	0.10	7859700
Acid Extractable Copper (Cu)	ug/g	11	0.50	7859700
Acid Extractable Lead (Pb)	ug/g	4.0	1.0	7859700
Acid Extractable Molybdenum (Mo)	ug/g	0.77	0.50	7859700
Acid Extractable Nickel (Ni)	ug/g	9.2	0.50	7859700
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	7859700
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	7859700
Acid Extractable Thallium (Tl)	ug/g	0.098	0.050	7859700
Acid Extractable Uranium (U)	ug/g	0.45	0.050	7859700
Acid Extractable Vanadium (V)	ug/g	25	5.0	7859700
Acid Extractable Zinc (Zn)	ug/g	16	5.0	7859700
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	7859700

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RYK957	RYK958	RYK959	RYK960	RYK961	RYK962		
Sampling Date		2022/02/14 12:00	2022/02/14 12:00	2022/02/16 12:00	2022/02/16 12:00	2022/02/22 12:00	2022/02/22 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	DUP-1	RDL	QC Batch
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	0.019	<0.0071	0.015	0.012	0.0071	7855560
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0050	<0.0050	0.058	<0.0050	0.018	0.034	0.0050	7858244
Acenaphthylene	ug/g	<0.0050	<0.0050	0.027	<0.0050	0.0060	0.0079	0.0050	7858244
Anthracene	ug/g	<0.0050	<0.0050	0.13	<0.0050	0.036	0.096	0.0050	7858244
Benzo(a)anthracene	ug/g	0.010	<0.0050	0.48	<0.0050	0.065	0.25	0.0050	7858244
Benzo(a)pyrene	ug/g	0.0083	<0.0050	0.40	<0.0050	0.047	0.18	0.0050	7858244
Benzo(b/j)fluoranthene	ug/g	0.013	<0.0050	0.52	<0.0050	0.067	0.24	0.0050	7858244
Benzo(g,h,i)perylene	ug/g	0.0061	<0.0050	0.24	<0.0050	0.029	0.10	0.0050	7858244
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	0.22	<0.0050	0.023	0.082	0.0050	7858244
Chrysene	ug/g	0.0090	<0.0050	0.35	<0.0050	0.047	0.18	0.0050	7858244
Dibenzo(a,h)anthracene	ug/g	<0.0050	<0.0050	0.054	<0.0050	0.0067	0.023	0.0050	7858244
Fluoranthene	ug/g	0.023	<0.0050	1.1	<0.0050	0.15	0.52	0.0050	7858244
Fluorene	ug/g	<0.0050	<0.0050	0.055	<0.0050	0.014	0.027	0.0050	7858244
Indeno(1,2,3-cd)pyrene	ug/g	0.0059	<0.0050	0.26	<0.0050	0.033	0.11	0.0050	7858244
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0093	<0.0050	0.0067	0.0057	0.0050	7858244
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.010	<0.0050	0.0082	0.0064	0.0050	7858244
Naphthalene	ug/g	<0.0050	<0.0050	0.017	<0.0050	0.0088	0.0079	0.0050	7858244
Phenanthrene	ug/g	0.018	<0.0050	0.61	<0.0050	0.13	0.33	0.0050	7858244
Pyrene	ug/g	0.018	<0.0050	0.84	<0.0050	0.11	0.40	0.0050	7858244
Surrogate Recovery (%)									
D10-Anthracene	%	109	107	108	105	114	110		7858244
D14-Terphenyl (FS)	%	109	104	107	101	109	108		7858244
D8-Acenaphthylene	%	115	103	110	98	118	114		7858244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RYK963	RYK964	RYK965			RYK965		
Sampling Date		2022/02/22 12:00	2022/02/23 12:00	2022/02/23 12:00			2022/02/23 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01			865599-06-01		
	UNITS	22-3 SA12	22-4 SA5	22-4 SA11	RDL	QC Batch	22-4 SA11 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	0.026	<0.0071	0.0071	7855560			
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0050	0.022	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Acenaphthylene	ug/g	<0.0050	0.014	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Anthracene	ug/g	<0.0050	0.057	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Benzo(a)anthracene	ug/g	<0.0050	0.12	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Benzo(a)pyrene	ug/g	<0.0050	0.091	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.13	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Benzo(g,h,i)perylene	ug/g	<0.0050	0.061	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Benzo(k)fluoranthene	ug/g	<0.0050	0.043	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Chrysene	ug/g	<0.0050	0.086	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Dibenzo(a,h)anthracene	ug/g	<0.0050	0.014	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Fluoranthene	ug/g	<0.0050	0.26	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Fluorene	ug/g	<0.0050	0.033	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.065	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
1-Methylnaphthalene	ug/g	<0.0050	0.011	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
2-Methylnaphthalene	ug/g	<0.0050	0.015	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Naphthalene	ug/g	<0.0050	0.042	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Phenanthrene	ug/g	0.0061	0.20	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Pyrene	ug/g	<0.0050	0.19	<0.0050	0.0050	7858244	<0.0050	0.0050	7858244
Surrogate Recovery (%)									
D10-Anthracene	%	99	101	106		7858244	108		7858244
D14-Terphenyl (FS)	%	95	99	103		7858244	107		7858244
D8-Acenaphthylene	%	105	105	103		7858244	109		7858244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RYK966	RYK967		
Sampling Date		2022/02/24 12:00	2022/02/24 12:00		
COC Number		865599-06-01	865599-06-01		
	UNITS	22-5 SA3	22-5 SA10	RDL	QC Batch
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	0.0071	7855560
Polyaromatic Hydrocarbons					
Acenaphthene	ug/g	0.016	<0.0050	0.0050	7858244
Acenaphthylene	ug/g	0.0068	<0.0050	0.0050	7858244
Anthracene	ug/g	0.043	<0.0050	0.0050	7858244
Benzo(a)anthracene	ug/g	0.11	<0.0050	0.0050	7858244
Benzo(a)pyrene	ug/g	0.083	<0.0050	0.0050	7858244
Benzo(b/j)fluoranthene	ug/g	0.11	<0.0050	0.0050	7858244
Benzo(g,h,i)perylene	ug/g	0.048	<0.0050	0.0050	7858244
Benzo(k)fluoranthene	ug/g	0.046	<0.0050	0.0050	7858244
Chrysene	ug/g	0.083	<0.0050	0.0050	7858244
Dibenzo(a,h)anthracene	ug/g	0.0098	<0.0050	0.0050	7858244
Fluoranthene	ug/g	0.25	<0.0050	0.0050	7858244
Fluorene	ug/g	0.020	<0.0050	0.0050	7858244
Indeno(1,2,3-cd)pyrene	ug/g	0.053	<0.0050	0.0050	7858244
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0050	7858244
2-Methylnaphthalene	ug/g	0.0054	<0.0050	0.0050	7858244
Naphthalene	ug/g	0.011	<0.0050	0.0050	7858244
Phenanthrene	ug/g	0.18	<0.0050	0.0050	7858244
Pyrene	ug/g	0.19	<0.0050	0.0050	7858244
Surrogate Recovery (%)					
D10-Anthracene	%	109	109		7858244
D14-Terphenyl (FS)	%	105	106		7858244
D8-Acenaphthylene	%	109	107		7858244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RYK957	RYK958	RYK959	RYK960	RYK961		
Sampling Date		2022/02/14 12:00	2022/02/14 12:00	2022/02/16 12:00	2022/02/16 12:00	2022/02/22 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	RDL	QC Batch
Inorganics								
Moisture	%	8.1	7.9	6.8	5.7	15	1.0	7856491
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7856055
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.49	<0.49	<0.49	<0.49	<0.49	0.49	7857233
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	7857233
Bromodichloromethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Bromoform	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Bromomethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Carbon Tetrachloride	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Chlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Chloroform	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Dibromochloromethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,2-Dichlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,3-Dichlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,4-Dichlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,1-Dichloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,2-Dichloroethane	ug/g	<0.049	<0.049	<0.049	<0.049	<0.049	0.049	7857233
1,1-Dichloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
cis-1,2-Dichloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
trans-1,2-Dichloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,2-Dichloropropane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	7857233
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7857233
Ethylene Dibromide	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Hexane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Methylene Chloride(Dichloromethane)	ug/g	<0.049	<0.049	<0.049	<0.049	<0.049	0.049	7857233
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7857233
Methyl Isobutyl Ketone	ug/g	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7857233
Methyl t-butyl ether (MTBE)	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Styrene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RYK957	RYK958	RYK959	RYK960	RYK961		
Sampling Date		2022/02/14 12:00	2022/02/14 12:00	2022/02/16 12:00	2022/02/16 12:00	2022/02/22 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	22-1 SA4	22-1 SA10	22-2 SA2	22-2 SA10	22-3 SA1	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,1,2,2-Tetrachloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Tetrachloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Toluene	ug/g	<0.020	<0.020	0.037	<0.020	<0.020	0.020	7857233
1,1,1-Trichloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,1,2-Trichloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Trichloroethylene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7857233
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Vinyl Chloride	ug/g	<0.019	<0.019	<0.019	<0.019	<0.019	0.019	7857233
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	7857233
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	7857233
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	7856921
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	83	<50	100	50	7856921
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	190	50	7856921
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	No		7856921
Surrogate Recovery (%)								
o-Terphenyl	%	98	101	99	103	103		7856921
4-Bromofluorobenzene	%	91	91	91	90	94		7857233
D10-o-Xylene	%	97	94	96	90	87		7857233
D4-1,2-Dichloroethane	%	100	103	101	97	119		7857233
D8-Toluene	%	97	91	97	93	92		7857233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RYK962	RYK963	RYK964	RYK965	RYK966		
Sampling Date		2022/02/22 12:00	2022/02/22 12:00	2022/02/23 12:00	2022/02/23 12:00	2022/02/24 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	DUP-1	22-3 SA12	22-4 SA5	22-4 SA11	22-5 SA3	RDL	QC Batch
Inorganics								
Moisture	%	16	6.8	10	9.3	7.6	1.0	7856491
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7856055
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.49	<0.49	<0.49	<0.49	<0.49	0.49	7857233
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	7857233
Bromodichloromethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Bromoform	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Bromomethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Carbon Tetrachloride	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Chlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Chloroform	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Dibromochloromethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,2-Dichlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,3-Dichlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,4-Dichlorobenzene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,1-Dichloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,2-Dichloroethane	ug/g	<0.049	<0.049	<0.049	<0.049	<0.049	0.049	7857233
1,1-Dichloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
cis-1,2-Dichloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
trans-1,2-Dichloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,2-Dichloropropane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	7857233
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7857233
Ethylene Dibromide	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Hexane	ug/g	0.050	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Methylene Chloride(Dichloromethane)	ug/g	<0.049	<0.049	<0.049	<0.049	<0.049	0.049	7857233
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7857233
Methyl Isobutyl Ketone	ug/g	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7857233
Methyl t-butyl ether (MTBE)	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Styrene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RYK962	RYK963	RYK964	RYK965	RYK966		
Sampling Date		2022/02/22 12:00	2022/02/22 12:00	2022/02/23 12:00	2022/02/23 12:00	2022/02/24 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	DUP-1	22-3 SA12	22-4 SA5	22-4 SA11	22-5 SA3	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,1,2,2-Tetrachloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Tetrachloroethylene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
1,1,1-Trichloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
1,1,2-Trichloroethane	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Trichloroethylene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7857233
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7857233
Vinyl Chloride	ug/g	<0.019	<0.019	<0.019	<0.019	<0.019	0.019	7857233
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7857233
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	7857233
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	7857233
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	7856921
F3 (C16-C34 Hydrocarbons)	ug/g	87	<50	73	<50	<50	50	7856921
F4 (C34-C50 Hydrocarbons)	ug/g	160	<50	<50	<50	<50	50	7856921
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes		7856921
Surrogate Recovery (%)								
o-Terphenyl	%	105	104	105	99	100		7856921
4-Bromofluorobenzene	%	92	92	88	94	92		7857233
D10-o-Xylene	%	90	87	90	95	94		7857233
D4-1,2-Dichloroethane	%	113	111	104	122	112		7857233
D8-Toluene	%	90	93	96	90	93		7857233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RYK967		
Sampling Date		2022/02/24 12:00		
COC Number		865599-06-01		
	UNITS	22-5 SA10	RDL	QC Batch
Inorganics				
Moisture	%	12	1.0	7856491
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	7856055
Volatile Organics				
Acetone (2-Propanone)	ug/g	<0.49	0.49	7857233
Benzene	ug/g	<0.0060	0.0060	7857233
Bromodichloromethane	ug/g	<0.040	0.040	7857233
Bromoform	ug/g	<0.040	0.040	7857233
Bromomethane	ug/g	<0.040	0.040	7857233
Carbon Tetrachloride	ug/g	<0.040	0.040	7857233
Chlorobenzene	ug/g	<0.040	0.040	7857233
Chloroform	ug/g	<0.040	0.040	7857233
Dibromochloromethane	ug/g	<0.040	0.040	7857233
1,2-Dichlorobenzene	ug/g	<0.040	0.040	7857233
1,3-Dichlorobenzene	ug/g	<0.040	0.040	7857233
1,4-Dichlorobenzene	ug/g	<0.040	0.040	7857233
Dichlorodifluoromethane (FREON 12)	ug/g	<0.040	0.040	7857233
1,1-Dichloroethane	ug/g	<0.040	0.040	7857233
1,2-Dichloroethane	ug/g	<0.049	0.049	7857233
1,1-Dichloroethylene	ug/g	<0.040	0.040	7857233
cis-1,2-Dichloroethylene	ug/g	<0.040	0.040	7857233
trans-1,2-Dichloroethylene	ug/g	<0.040	0.040	7857233
1,2-Dichloropropane	ug/g	<0.040	0.040	7857233
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	7857233
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	7857233
Ethylbenzene	ug/g	<0.010	0.010	7857233
Ethylene Dibromide	ug/g	<0.040	0.040	7857233
Hexane	ug/g	<0.040	0.040	7857233
Methylene Chloride(Dichloromethane)	ug/g	<0.049	0.049	7857233
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.40	0.40	7857233
Methyl Isobutyl Ketone	ug/g	<0.40	0.40	7857233
Methyl t-butyl ether (MTBE)	ug/g	<0.040	0.040	7857233
Styrene	ug/g	<0.040	0.040	7857233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Bureau Veritas ID		RYK967		
Sampling Date		2022/02/24 12:00		
COC Number		865599-06-01		
	UNITS	22-5 SA10	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	<0.040	0.040	7857233
1,1,2,2-Tetrachloroethane	ug/g	<0.040	0.040	7857233
Tetrachloroethylene	ug/g	<0.040	0.040	7857233
Toluene	ug/g	<0.020	0.020	7857233
1,1,1-Trichloroethane	ug/g	<0.040	0.040	7857233
1,1,2-Trichloroethane	ug/g	<0.040	0.040	7857233
Trichloroethylene	ug/g	<0.010	0.010	7857233
Trichlorofluoromethane (FREON 11)	ug/g	<0.040	0.040	7857233
Vinyl Chloride	ug/g	<0.019	0.019	7857233
p+m-Xylene	ug/g	<0.020	0.020	7857233
o-Xylene	ug/g	<0.020	0.020	7857233
Total Xylenes	ug/g	<0.020	0.020	7857233
F1 (C6-C10)	ug/g	<10	10	7857233
F1 (C6-C10) - BTEX	ug/g	<10	10	7857233
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	7856921
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	7856921
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	7856921
Reached Baseline at C50	ug/g	Yes		7856921
Surrogate Recovery (%)				
o-Terphenyl	%	101		7856921
4-Bromofluorobenzene	%	92		7857233
D10-o-Xylene	%	96		7857233
D4-1,2-Dichloroethane	%	105		7857233
D8-Toluene	%	95		7857233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		RYK957		RYK958		RYK958		RYK959		
Sampling Date		2022/02/14 12:00		2022/02/14 12:00		2022/02/14 12:00		2022/02/16 12:00		
COC Number		865599-06-01		865599-06-01		865599-06-01		865599-06-01		
	UNITS	22-1 SA4	QC Batch	22-1 SA10	QC Batch	22-1 SA10 Lab-Dup	QC Batch	22-2 SA2	RDL	QC Batch
Calculated Parameters										
Sodium Adsorption Ratio	N/A	11	7856130	7.1	7856130			0.38		7856130
Inorganics										
Conductivity	mS/cm	0.29	7857478	0.54	7857478	0.54	7857478	0.34	0.002	7857478
Available (CaCl2) pH	pH	8.02	7859675	8.11	7857278					

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas ID		RYK960		RYK961		RYK962	RYK963		
Sampling Date		2022/02/16 12:00		2022/02/22 12:00		2022/02/22 12:00	2022/02/22 12:00		
COC Number		865599-06-01		865599-06-01		865599-06-01	865599-06-01		
	UNITS	22-2 SA10	QC Batch	22-3 SA1	QC Batch	DUP-1	22-3 SA12	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	1.5	7856130	1.7	7856130	1.6	7.9		7856130
Inorganics									
Conductivity	mS/cm	0.21	7857478	0.79	7857478	0.74	0.43	0.002	7857478
Available (CaCl2) pH	pH			10.3	7859675	10.6	8.12		7857278

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		RYK964	RYK965	RYK966		RYK967		
Sampling Date		2022/02/23 12:00	2022/02/23 12:00	2022/02/24 12:00		2022/02/24 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01		865599-06-01		
	UNITS	22-4 SA5	22-4 SA11	22-5 SA3	QC Batch	22-5 SA10	RDL	QC Batch
Calculated Parameters								
Sodium Adsorption Ratio	N/A	1.4	5.9	1.1	7856130	1.0		7856130
Inorganics								
Conductivity	mS/cm	1.1	0.37	0.32	7857478	0.22	0.002	7857478
Available (CaCl2) pH	pH					8.14		7857278

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Job #: C251308
Report Date: 2022/03/04

Golder Associates Ltd
Client Project #: 22511882
Site Location: LIBRARY
Sampler Initials: KH

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		RYK957	RYK958	RYK959	RYK960	RYK961	RYK962		
Sampling Date		2022/02/14 12:00	2022/02/14 12:00	2022/02/16 12:00	2022/02/16 12:00	2022/02/22 12:00	2022/02/22 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	**22-1 SA4**	**22-1 SA10**	**22-2 SA2**	**22-2 SA10**	**22-3 SA1**	**DUP-1**	**RDL**	**QC Batch**
Inorganics									
Chromium (VI)	ug/g	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	0.18	7857303

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		RYK963	RYK964	RYK965	RYK966	RYK967		
Sampling Date		2022/02/22 12:00	2022/02/23 12:00	2022/02/23 12:00	2022/02/24 12:00	2022/02/24 12:00		
COC Number		865599-06-01	865599-06-01	865599-06-01	865599-06-01	865599-06-01		
	UNITS	**22-3 SA12**	**22-4 SA5**	**22-4 SA11**	**22-5 SA3**	**22-5 SA10**	**RDL**	**QC Batch**
Inorganics								
Chromium (VI)	ug/g	<0.18	<0.18	<0.18	<0.18	<0.18	0.18	7857303

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

PETROLEUM HYDROCARBONS (CCME)

Bureau Veritas ID		RYK961		
Sampling Date		2022/02/22 12:00		
COC Number		865599-06-01		
	UNITS	22-3 SA1	RDL	QC Batch
F2-F4 Hydrocarbons				
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	810	100	7861871

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

TEST SUMMARY

Bureau Veritas ID: RYK957 **Collected:** 2022/02/14
Sample ID: 22-1 SA4 **Shipped:**
Matrix: Soil **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
pH CaCl2 EXTRACT	AT	7859675	2022/03/02	2022/03/02	Taslima Aktar
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK958 **Collected:** 2022/02/14
Sample ID: 22-1 SA10 **Shipped:**
Matrix: Soil **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
pH CaCl2 EXTRACT	AT	7857278	2022/03/01	2022/03/01	Taslima Aktar
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK958 Dup **Collected:** 2022/02/14
Sample ID: 22-1 SA10 **Shipped:**
Matrix: Soil **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran

Bureau Veritas ID: RYK959 **Collected:** 2022/02/16
Sample ID: 22-2 SA2 **Shipped:**
Matrix: Soil **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila

TEST SUMMARY

Bureau Veritas ID: RYK959
Sample ID: 22-2 SA2
Matrix: Soil

Collected: 2022/02/16
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK960
Sample ID: 22-2 SA10
Matrix: Soil

Collected: 2022/02/16
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK961
Sample ID: 22-3 SA1
Matrix: Soil

Collected: 2022/02/22
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
F4G (CCME Hydrocarbons Gravimetric)	BAL	7861871	2022/03/03	2022/03/03	Fardous Fatama
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
pH CaCl2 EXTRACT	AT	7859675	2022/03/02	2022/03/02	Taslima Aktar
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

TEST SUMMARY

Bureau Veritas ID: RYK962
Sample ID: DUP-1
Matrix: Soil

Collected: 2022/02/22
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
pH CaCl2 EXTRACT	AT	7857278	2022/03/01	2022/03/01	Taslima Aktar
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK963
Sample ID: 22-3 SA12
Matrix: Soil

Collected: 2022/02/22
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
pH CaCl2 EXTRACT	AT	7857278	2022/03/01	2022/03/01	Taslima Aktar
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK964
Sample ID: 22-4 SA5
Matrix: Soil

Collected: 2022/02/23
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

TEST SUMMARY

Bureau Veritas ID: RYK965
Sample ID: 22-4 SA11
Matrix: Soil

Collected: 2022/02/23
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK965 Dup
Sample ID: 22-4 SA11
Matrix: Soil

Collected: 2022/02/23
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj

Bureau Veritas ID: RYK966
Sample ID: 22-5 SA3
Matrix: Soil

Collected: 2022/02/24
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7857371	2022/03/01	2022/03/02	Viviana Canzonieri
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

Bureau Veritas ID: RYK967
Sample ID: 22-5 SA10
Matrix: Soil

Collected: 2022/02/24
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855560	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7856055	N/A	2022/03/02	Automated Statchk
Conductivity	AT	7857478	2022/03/01	2022/03/01	Kien Tran
Hexavalent Chromium in Soil by IC	IC/SPEC	7857303	2022/03/01	2022/03/02	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7856921	2022/02/28	2022/03/01	Suleeqa Nurr
Acid Extractable Metals by ICPMS	ICP/MS	7859700	2022/03/02	2022/03/02	Viviana Canzonieri

Bureau Veritas Job #: C251308
Report Date: 2022/03/04

Golder Associates Ltd
Client Project #: 22511882
Site Location: LIBRARY
Sampler Initials: KH

TEST SUMMARY

Bureau Veritas ID: RYK967
Sample ID: 22-5 SA10
Matrix: Soil

Collected: 2022/02/24
Shipped:
Received: 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	7856491	N/A	2022/02/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7858244	2022/03/01	2022/03/02	Mitesh Raj
pH CaCl2 EXTRACT	AT	7857278	2022/03/01	2022/03/01	Taslima Aktar
Sodium Adsorption Ratio (SAR)	CALC/MET	7856130	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7857233	N/A	2022/03/01	Blair Gannon

GENERAL COMMENTS

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

Package 1	7.7°C

Revsed Report (2022/03/04): Mercury reported with metals parameters

Sample RYK957 [22-1 SA4] : VOCF1 Analysis: The sample was analyzed after the 14 day holding time specified by the method had expired.

Sample RYK958 [22-1 SA10] : VOCF1 Analysis: The sample was analyzed after the 14 day holding time specified by the method had expired.

PETROLEUM HYDROCARBONS (CCME)

F4G (CCME Hydrocarbons Gravimetric): The recovery in the matrix spike was not calculated (NC). Because of the high concentration of this analyte in the parent sample, the relative difference between the spiked and unspiked concentrations is not sufficiently significant to permit a reliable recovery calculation.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7856921	o-Terphenyl	2022/03/01	98	60 - 130	101	60 - 130	101	%		
7857233	4-Bromofluorobenzene	2022/03/01	101	60 - 140	101	60 - 140	94	%		
7857233	D10-o-Xylene	2022/03/01	103	60 - 130	97	60 - 130	92	%		
7857233	D4-1,2-Dichloroethane	2022/03/01	99	60 - 140	102	60 - 140	104	%		
7857233	D8-Toluene	2022/03/01	105	60 - 140	103	60 - 140	96	%		
7858244	D10-Anthracene	2022/03/02	104	50 - 130	104	50 - 130	101	%		
7858244	D14-Terphenyl (FS)	2022/03/02	101	50 - 130	100	50 - 130	96	%		
7858244	D8-Acenaphthylene	2022/03/02	109	50 - 130	108	50 - 130	102	%		
7856491	Moisture	2022/02/28							1.6	20
7856921	F2 (C10-C16 Hydrocarbons)	2022/03/01	111	60 - 130	107	80 - 120	<10	ug/g	NC	30
7856921	F3 (C16-C34 Hydrocarbons)	2022/03/01	111	60 - 130	106	80 - 120	<50	ug/g	0	30
7856921	F4 (C34-C50 Hydrocarbons)	2022/03/01	117	60 - 130	111	80 - 120	<50	ug/g	1.8	30
7857233	1,1,1,2-Tetrachloroethane	2022/03/01	96	60 - 140	94	60 - 130	<0.040	ug/g	NC	50
7857233	1,1,1-Trichloroethane	2022/03/01	106	60 - 140	102	60 - 130	<0.040	ug/g	NC	50
7857233	1,1,2,2-Tetrachloroethane	2022/03/01	102	60 - 140	105	60 - 130	<0.040	ug/g	NC	50
7857233	1,1,2-Trichloroethane	2022/03/01	96	60 - 140	97	60 - 130	<0.040	ug/g	NC	50
7857233	1,1-Dichloroethane	2022/03/01	95	60 - 140	94	60 - 130	<0.040	ug/g	NC	50
7857233	1,1-Dichloroethylene	2022/03/01	105	60 - 140	101	60 - 130	<0.040	ug/g	NC	50
7857233	1,2-Dichlorobenzene	2022/03/01	90	60 - 140	88	60 - 130	<0.040	ug/g	NC	50
7857233	1,2-Dichloroethane	2022/03/01	91	60 - 140	94	60 - 130	<0.049	ug/g	NC	50
7857233	1,2-Dichloropropane	2022/03/01	93	60 - 140	94	60 - 130	<0.040	ug/g	NC	50
7857233	1,3-Dichlorobenzene	2022/03/01	92	60 - 140	88	60 - 130	<0.040	ug/g	NC	50
7857233	1,4-Dichlorobenzene	2022/03/01	107	60 - 140	104	60 - 130	<0.040	ug/g	NC	50
7857233	Acetone (2-Propanone)	2022/03/01	104	60 - 140	103	60 - 140	<0.49	ug/g	NC	50
7857233	Benzene	2022/03/01	92	60 - 140	90	60 - 130	<0.0060	ug/g	NC	50
7857233	Bromodichloromethane	2022/03/01	96	60 - 140	98	60 - 130	<0.040	ug/g	NC	50
7857233	Bromoform	2022/03/01	89	60 - 140	91	60 - 130	<0.040	ug/g	NC	50
7857233	Bromomethane	2022/03/01	108	60 - 140	107	60 - 140	<0.040	ug/g	NC	50
7857233	Carbon Tetrachloride	2022/03/01	104	60 - 140	99	60 - 130	<0.040	ug/g	NC	50
7857233	Chlorobenzene	2022/03/01	97	60 - 140	95	60 - 130	<0.040	ug/g	NC	50
7857233	Chloroform	2022/03/01	98	60 - 140	98	60 - 130	<0.040	ug/g	NC	50
7857233	cis-1,2-Dichloroethylene	2022/03/01	112	60 - 140	113	60 - 130	<0.040	ug/g	NC	50

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
7857233	cis-1,3-Dichloropropene	2022/03/01	91	60 - 140	94	60 - 130	<0.030	ug/g	NC	50
7857233	Dibromochloromethane	2022/03/01	89	60 - 140	89	60 - 130	<0.040	ug/g	NC	50
7857233	Dichlorodifluoromethane (FREON 12)	2022/03/01	105	60 - 140	102	60 - 140	<0.040	ug/g	NC	50
7857233	Ethylbenzene	2022/03/01	92	60 - 140	89	60 - 130	<0.010	ug/g	NC	50
7857233	Ethylene Dibromide	2022/03/01	88	60 - 140	89	60 - 130	<0.040	ug/g	NC	50
7857233	F1 (C6-C10) - BTEX	2022/03/01					<10	ug/g	NC	30
7857233	F1 (C6-C10)	2022/03/01	110	60 - 140	92	80 - 120	<10	ug/g	NC	30
7857233	Hexane	2022/03/01	110	60 - 140	102	60 - 130	<0.040	ug/g	NC	50
7857233	Methyl Ethyl Ketone (2-Butanone)	2022/03/01	95	60 - 140	102	60 - 140	<0.40	ug/g	NC	50
7857233	Methyl Isobutyl Ketone	2022/03/01	85	60 - 140	95	60 - 130	<0.40	ug/g	NC	50
7857233	Methyl t-butyl ether (MTBE)	2022/03/01	87	60 - 140	91	60 - 130	<0.040	ug/g	NC	50
7857233	Methylene Chloride(Dichloromethane)	2022/03/01	106	60 - 140	106	60 - 130	<0.049	ug/g	NC	50
7857233	o-Xylene	2022/03/01	93	60 - 140	90	60 - 130	<0.020	ug/g	NC	50
7857233	p+m-Xylene	2022/03/01	95	60 - 140	93	60 - 130	<0.020	ug/g	NC	50
7857233	Styrene	2022/03/01	101	60 - 140	102	60 - 130	<0.040	ug/g	NC	50
7857233	Tetrachloroethylene	2022/03/01	96	60 - 140	90	60 - 130	<0.040	ug/g	NC	50
7857233	Toluene	2022/03/01	97	60 - 140	95	60 - 130	<0.020	ug/g	NC	50
7857233	Total Xylenes	2022/03/01					<0.020	ug/g	NC	50
7857233	trans-1,2-Dichloroethylene	2022/03/01	100	60 - 140	99	60 - 130	<0.040	ug/g	NC	50
7857233	trans-1,3-Dichloropropene	2022/03/01	99	60 - 140	101	60 - 130	<0.040	ug/g	NC	50
7857233	Trichloroethylene	2022/03/01	105	60 - 140	103	60 - 130	<0.010	ug/g	1.6	50
7857233	Trichlorofluoromethane (FREON 11)	2022/03/01	115	60 - 140	110	60 - 130	<0.040	ug/g	NC	50
7857233	Vinyl Chloride	2022/03/01	110	60 - 140	108	60 - 130	<0.019	ug/g	NC	50
7857278	Available (CaCl2) pH	2022/03/01			100	97 - 103			0.91	N/A
7857303	Chromium (VI)	2022/03/02	86	70 - 130	92	80 - 120	<0.18	ug/g	NC	35
7857371	Acid Extractable Antimony (Sb)	2022/03/02	94	75 - 125	102	80 - 120	<0.20	ug/g	NC	30
7857371	Acid Extractable Arsenic (As)	2022/03/02	92	75 - 125	101	80 - 120	<1.0	ug/g	2.0	30
7857371	Acid Extractable Barium (Ba)	2022/03/02	90	75 - 125	101	80 - 120	<0.50	ug/g	1.8	30
7857371	Acid Extractable Beryllium (Be)	2022/03/02	96	75 - 125	101	80 - 120	<0.20	ug/g	NC	30
7857371	Acid Extractable Boron (B)	2022/03/02	92	75 - 125	101	80 - 120	<5.0	ug/g	NC	30
7857371	Acid Extractable Cadmium (Cd)	2022/03/02	93	75 - 125	102	80 - 120	<0.10	ug/g	NC	30
7857371	Acid Extractable Chromium (Cr)	2022/03/02	90	75 - 125	103	80 - 120	<1.0	ug/g	5.7	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
7857371	Acid Extractable Cobalt (Co)	2022/03/02	93	75 - 125	105	80 - 120	<0.10	ug/g	3.0	30
7857371	Acid Extractable Copper (Cu)	2022/03/02	90	75 - 125	100	80 - 120	<0.50	ug/g	0.39	30
7857371	Acid Extractable Lead (Pb)	2022/03/02	93	75 - 125	104	80 - 120	<1.0	ug/g	1.2	30
7857371	Acid Extractable Mercury (Hg)	2022/03/02	82	75 - 125	90	80 - 120	<0.050	ug/g	NC	30
7857371	Acid Extractable Molybdenum (Mo)	2022/03/02	96	75 - 125	102	80 - 120	<0.50	ug/g	NC	30
7857371	Acid Extractable Nickel (Ni)	2022/03/02	88	75 - 125	104	80 - 120	<0.50	ug/g	1.9	30
7857371	Acid Extractable Selenium (Se)	2022/03/02	94	75 - 125	104	80 - 120	<0.50	ug/g	NC	30
7857371	Acid Extractable Silver (Ag)	2022/03/02	96	75 - 125	105	80 - 120	<0.20	ug/g	NC	30
7857371	Acid Extractable Thallium (Tl)	2022/03/02	96	75 - 125	106	80 - 120	<0.050	ug/g	NC	30
7857371	Acid Extractable Uranium (U)	2022/03/02	97	75 - 125	105	80 - 120	<0.050	ug/g	0.89	30
7857371	Acid Extractable Vanadium (V)	2022/03/02	92	75 - 125	102	80 - 120	<5.0	ug/g	4.2	30
7857371	Acid Extractable Zinc (Zn)	2022/03/02	90	75 - 125	107	80 - 120	<5.0	ug/g	4.2	30
7857478	Conductivity	2022/03/01			100	90 - 110	<0.002	mS/cm	0.19	10
7858244	1-Methylnaphthalene	2022/03/02	89	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40
7858244	2-Methylnaphthalene	2022/03/02	89	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
7858244	Acenaphthene	2022/03/02	90	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40
7858244	Acenaphthylene	2022/03/02	93	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40
7858244	Anthracene	2022/03/02	88	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
7858244	Benzo(a)anthracene	2022/03/02	102	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
7858244	Benzo(a)pyrene	2022/03/02	91	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40
7858244	Benzo(b/j)fluoranthene	2022/03/02	99	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40
7858244	Benzo(g,h,i)perylene	2022/03/02	89	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40
7858244	Benzo(k)fluoranthene	2022/03/02	93	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40
7858244	Chrysene	2022/03/02	97	50 - 130	93	50 - 130	<0.0050	ug/g	NC	40
7858244	Dibenzo(a,h)anthracene	2022/03/02	90	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
7858244	Fluoranthene	2022/03/02	97	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40
7858244	Fluorene	2022/03/02	93	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40
7858244	Indeno(1,2,3-cd)pyrene	2022/03/02	92	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
7858244	Naphthalene	2022/03/02	79	50 - 130	83	50 - 130	<0.0050	ug/g	NC	40
7858244	Phenanthrene	2022/03/02	88	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40
7858244	Pyrene	2022/03/02	91	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40
7859675	Available (CaCl2) pH	2022/03/02			100	97 - 103			0.056	N/A

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7859700	Acid Extractable Antimony (Sb)	2022/03/02	108	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
7859700	Acid Extractable Arsenic (As)	2022/03/02	107	75 - 125	97	80 - 120	<1.0	ug/g	7.6	30
7859700	Acid Extractable Barium (Ba)	2022/03/02	NC	75 - 125	101	80 - 120	<0.50	ug/g	0.39	30
7859700	Acid Extractable Beryllium (Be)	2022/03/02	109	75 - 125	97	80 - 120	<0.20	ug/g	1.7	30
7859700	Acid Extractable Boron (B)	2022/03/02	103	75 - 125	97	80 - 120	<5.0	ug/g	1.3	30
7859700	Acid Extractable Cadmium (Cd)	2022/03/02	109	75 - 125	98	80 - 120	<0.10	ug/g	14	30
7859700	Acid Extractable Chromium (Cr)	2022/03/02	115	75 - 125	100	80 - 120	<1.0	ug/g	2.2	30
7859700	Acid Extractable Cobalt (Co)	2022/03/02	109	75 - 125	101	80 - 120	<0.10	ug/g	4.6	30
7859700	Acid Extractable Copper (Cu)	2022/03/02	104	75 - 125	96	80 - 120	<0.50	ug/g	2.8	30
7859700	Acid Extractable Lead (Pb)	2022/03/02	111	75 - 125	102	80 - 120	<1.0	ug/g	0.46	30
7859700	Acid Extractable Mercury (Hg)	2022/03/02	94	75 - 125	91	80 - 120	<0.050	ug/g	NC	30
7859700	Acid Extractable Molybdenum (Mo)	2022/03/02	113	75 - 125	102	80 - 120	<0.50	ug/g	NC	30
7859700	Acid Extractable Nickel (Ni)	2022/03/02	110	75 - 125	101	80 - 120	<0.50	ug/g	3.8	30
7859700	Acid Extractable Selenium (Se)	2022/03/02	110	75 - 125	102	80 - 120	<0.50	ug/g	NC	30
7859700	Acid Extractable Silver (Ag)	2022/03/02	112	75 - 125	101	80 - 120	<0.20	ug/g	NC	30
7859700	Acid Extractable Thallium (Tl)	2022/03/02	111	75 - 125	104	80 - 120	<0.050	ug/g	19	30
7859700	Acid Extractable Uranium (U)	2022/03/02	112	75 - 125	103	80 - 120	<0.050	ug/g	5.5	30
7859700	Acid Extractable Vanadium (V)	2022/03/02	113	75 - 125	100	80 - 120	<5.0	ug/g	1.0	30
7859700	Acid Extractable Zinc (Zn)	2022/03/02	NC	75 - 125	95	80 - 120	<5.0	ug/g	2.7	30
7861871	F4G-sg (Grav. Heavy Hydrocarbons)	2022/03/03	NC	65 - 135	101	65 - 135	<100	ug/g	15	50

N/A = Not Applicable

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

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

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

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

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

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

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

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvna.com

Your Project #: 22511882
Your C.O.C. #: 865600-01-01

Attention: Keith Holmes

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2022/03/04
Report #: R7029065
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C251314
Received: 2022/02/25, 12:10

Sample Matrix: Ground Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	6	N/A	2022/03/03	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	6	N/A	2022/03/02		EPA 8260C m
1,3-Dichloropropene Sum (1)	1	N/A	2022/03/04		EPA 8260C m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	6	2022/03/02	2022/03/03	CAM SOP-00316	CCME PHC-CWS m
Dissolved Metals by ICPMS (1)	6	N/A	2022/03/02	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM) (1)	6	2022/03/02	2022/03/03	CAM SOP-00318	EPA 8270D m
Volatile Organic Compounds and F1 PHCs (1)	5	N/A	2022/03/01	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds and F1 PHCs (1)	1	N/A	2022/03/04	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water (1)	1	N/A	2022/03/02	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas 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.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas 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 Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas 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 Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas 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

Your Project #: 22511882
Your C.O.C. #: 865600-01-01

Attention: Keith Holmes

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2022/03/04
Report #: R7029065
Version: 1 - Final

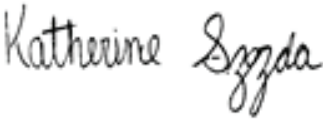
CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C251314

Received: 2022/02/25, 12:10

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



Katherine Szozda
Project Manager
04 Mar 2022 16:04:21

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 153 DISSOLVED ICPMS METALS (WATER)

Bureau Veritas ID		RYK989		RYK990	RYK991	RYK992		RYK993		
Sampling Date		2022/02/25 08:00		2022/02/25 08:30	2022/02/25 09:00	2022/02/25 09:30		2022/02/25 10:00		
COC Number		865600-01-01		865600-01-01	865600-01-01	865600-01-01		865600-01-01		
	UNITS	**22-1**	**RDL**	**22-2**	**22-3**	**22-4**	**RDL**	**22-5**	**RDL**	**QC Batch**
Metals										
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.57	<0.50	0.50	<2.5	2.5	7857170
Dissolved Arsenic (As)	ug/L	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<5.0	5.0	7857170
Dissolved Barium (Ba)	ug/L	380	2.0	49	96	73	2.0	280	10	7857170
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	<0.40	<0.40	<0.40	0.40	<2.0	2.0	7857170
Dissolved Boron (B)	ug/L	130	10	240	160	100	10	250	50	7857170
Dissolved Cadmium (Cd)	ug/L	0.092	0.090	<0.090	<0.090	<0.090	0.090	<0.45	0.45	7857170
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	<5.0	<5.0	5.0	43	25	7857170
Dissolved Cobalt (Co)	ug/L	4.0	0.50	6.1	1.1	<0.50	0.50	18	2.5	7857170
Dissolved Copper (Cu)	ug/L	2.1	0.90	1.4	2.8	1.2	0.90	73	4.5	7857170
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	<0.50	<0.50	0.50	20	2.5	7857170
Dissolved Molybdenum (Mo)	ug/L	16	0.50	28	17	38	0.50	3.1	2.5	7857170
Dissolved Nickel (Ni)	ug/L	8.7	1.0	12	6.4	<1.0	1.0	40	5.0	7857170
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	<2.0	<2.0	2.0	<10	10	7857170
Dissolved Silver (Ag)	ug/L	<0.090	0.090	<0.090	<0.090	<0.090	0.090	<0.45	0.45	7857170
Dissolved Sodium (Na)	ug/L	1300000	500	400000	450000	150000	100	210000	500	7857170
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.25	0.25	7857170
Dissolved Uranium (U)	ug/L	8.9	0.10	6.9	2.6	0.23	0.10	8.7	0.50	7857170
Dissolved Vanadium (V)	ug/L	0.76	0.50	<0.50	<0.50	<0.50	0.50	30	2.5	7857170
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	10	<5.0	5.0	63	25	7857170

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 DISSOLVED ICPMS METALS (WATER)

Bureau Veritas ID		RYK994		
Sampling Date		2022/02/25		
COC Number		865600-01-01		
	UNITS	DUP	RDL	QC Batch
Metals				
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7857170
Dissolved Arsenic (As)	ug/L	<1.0	1.0	7857170
Dissolved Barium (Ba)	ug/L	370	2.0	7857170
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7857170
Dissolved Boron (B)	ug/L	130	10	7857170
Dissolved Cadmium (Cd)	ug/L	0.095	0.090	7857170
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7857170
Dissolved Cobalt (Co)	ug/L	4.0	0.50	7857170
Dissolved Copper (Cu)	ug/L	1.6	0.90	7857170
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7857170
Dissolved Molybdenum (Mo)	ug/L	16	0.50	7857170
Dissolved Nickel (Ni)	ug/L	8.3	1.0	7857170
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7857170
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7857170
Dissolved Sodium (Na)	ug/L	1200000	500	7857170
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7857170
Dissolved Uranium (U)	ug/L	8.9	0.10	7857170
Dissolved Vanadium (V)	ug/L	0.73	0.50	7857170
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7857170

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 PAHS (GROUND WATER)

Bureau Veritas ID		RYK989	RYK990	RYK991	RYK992	RYK993	RYK994		
Sampling Date		2022/02/25 08:00	2022/02/25 08:30	2022/02/25 09:00	2022/02/25 09:30	2022/02/25 10:00	2022/02/25		
COC Number		865600-01-01	865600-01-01	865600-01-01	865600-01-01	865600-01-01	865600-01-01		
	UNITS	**22-1**	**22-2**	**22-3**	**22-4**	**22-5**	**DUP**	**RDL**	**QC Batch**
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/L	0.15	<0.071	<0.071	<0.071	0.091	0.15	0.071	7855406
Polyaromatic Hydrocarbons									
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.074	<0.050	0.050	7860689
Benzo(a)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Benzo(a)pyrene	ug/L	<0.0090	<0.0090	<0.0090	<0.0090	0.031	<0.0090	0.0090	7860689
Benzo(b/j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Dibenzo(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
Fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.22	<0.050	0.050	7860689
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	0.11	<0.050	0.050	7860689
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7860689
1-Methylnaphthalene	ug/L	0.068	<0.050	<0.050	<0.050	<0.050	0.067	0.050	7860689
2-Methylnaphthalene	ug/L	0.084	<0.050	<0.050	<0.050	0.091	0.078	0.050	7860689
Naphthalene	ug/L	<0.050	0.050	<0.050	<0.050	0.070	<0.050	0.050	7860689
Phenanthrene	ug/L	0.51	0.084	0.049	0.041	0.71	0.47	0.030	7860689
Pyrene	ug/L	0.12	<0.050	0.10	<0.050	0.19	0.11	0.050	7860689
Surrogate Recovery (%)									
D10-Anthracene	%	85	93	88	88	63	86		7860689
D14-Terphenyl (FS)	%	61	89	59	76	50	60		7860689
D8-Acenaphthylene	%	82	87	82	80	76	79		7860689

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (GROUND WATER)

Bureau Veritas ID		RYK989	RYK990	RYK991	RYK992	RYK993		
Sampling Date		2022/02/25 08:00	2022/02/25 08:30	2022/02/25 09:00	2022/02/25 09:30	2022/02/25 10:00		
COC Number		865600-01-01	865600-01-01	865600-01-01	865600-01-01	865600-01-01		
	UNITS	**22-1**	**22-2**	**22-3**	**22-4**	**22-5**	**RDL**	**QC Batch**
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7855690
Volatile Organics								
Acetone (2-Propanone)	ug/L	47	<10	<10	110	12	10	7854575
Benzene	ug/L	0.19	2.0	<0.17	0.47	0.21	0.17	7854575
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7854575
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
Chloroform	ug/L	<0.20	<0.20	0.89	7.5	<0.20	0.20	7854575
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7854575
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	7854575
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7854575
Ethylbenzene	ug/L	<0.20	0.23	<0.20	<0.20	<0.20	0.20	7854575
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7854575
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7854575
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	27	<10	10	7854575
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7854575
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
Toluene	ug/L	0.25	6.0	<0.20	0.50	0.24	0.20	7854575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (GROUND WATER)

Bureau Veritas ID		RYK989	RYK990	RYK991	RYK992	RYK993		
Sampling Date		2022/02/25 08:00	2022/02/25 08:30	2022/02/25 09:00	2022/02/25 09:30	2022/02/25 10:00		
COC Number		865600-01-01	865600-01-01	865600-01-01	865600-01-01	865600-01-01		
	UNITS	22-1	22-2	22-3	22-4	22-5	RDL	QC Batch
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7854575
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7854575
p+m-Xylene	ug/L	<0.20	1.9	<0.20	<0.20	<0.20	0.20	7854575
o-Xylene	ug/L	<0.20	0.59	<0.20	<0.20	<0.20	0.20	7854575
Total Xylenes	ug/L	<0.20	2.5	<0.20	<0.20	<0.20	0.20	7854575
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	25	7854575
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	25	7854575
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	7860698
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	220	<200	<200	200	7860698
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	7860698
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		7860698
Surrogate Recovery (%)								
o-Terphenyl	%	99	98	92	99	90		7860698
4-Bromofluorobenzene	%	115	88	88	80	87		7854575
D4-1,2-Dichloroethane	%	121	121	123	121	124		7854575
D8-Toluene	%	95	121	94	89	97		7854575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (GROUND WATER)

Bureau Veritas ID		RYK994		
Sampling Date		2022/02/25		
COC Number		865600-01-01		
	UNITS	DUP	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	7855690
Volatile Organics				
Acetone (2-Propanone)	ug/L	41	10	7854575
Benzene	ug/L	0.20	0.17	7854575
Bromodichloromethane	ug/L	<0.50	0.50	7854575
Bromoform	ug/L	<1.0	1.0	7854575
Bromomethane	ug/L	<0.50	0.50	7854575
Carbon Tetrachloride	ug/L	<0.20	0.20	7854575
Chlorobenzene	ug/L	<0.20	0.20	7854575
Chloroform	ug/L	<0.20	0.20	7854575
Dibromochloromethane	ug/L	<0.50	0.50	7854575
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7854575
1,3-Dichlorobenzene	ug/L	<0.50	0.50	7854575
1,4-Dichlorobenzene	ug/L	<0.50	0.50	7854575
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7854575
1,1-Dichloroethane	ug/L	<0.20	0.20	7854575
1,2-Dichloroethane	ug/L	<0.50	0.50	7854575
1,1-Dichloroethylene	ug/L	<0.20	0.20	7854575
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7854575
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7854575
1,2-Dichloropropane	ug/L	<0.20	0.20	7854575
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7854575
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7854575
Ethylbenzene	ug/L	<0.20	0.20	7854575
Ethylene Dibromide	ug/L	<0.20	0.20	7854575
Hexane	ug/L	<1.0	1.0	7854575
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7854575
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7854575
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7854575
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7854575
Styrene	ug/L	<0.50	0.50	7854575
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7854575
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7854575
Tetrachloroethylene	ug/L	<0.20	0.20	7854575
Toluene	ug/L	0.26	0.20	7854575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (GROUND WATER)

Bureau Veritas ID		RYK994		
Sampling Date		2022/02/25		
COC Number		865600-01-01		
	UNITS	**DUP**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7854575
1,1,2-Trichloroethane	ug/L	<0.50	0.50	7854575
Trichloroethylene	ug/L	<0.20	0.20	7854575
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7854575
Vinyl Chloride	ug/L	<0.20	0.20	7854575
p+m-Xylene	ug/L	<0.20	0.20	7854575
o-Xylene	ug/L	<0.20	0.20	7854575
Total Xylenes	ug/L	<0.20	0.20	7854575
F1 (C6-C10)	ug/L	<25	25	7854575
F1 (C6-C10) - BTEX	ug/L	<25	25	7854575
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	7860698
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	7860698
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	7860698
Reached Baseline at C50	ug/L	Yes		7860698
Surrogate Recovery (%)				
o-Terphenyl	%	93		7860698
4-Bromofluorobenzene	%	102		7854575
D4-1,2-Dichloroethane	%	99		7854575
D8-Toluene	%	96		7854575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS (WATER)

Bureau Veritas ID		RYK995		
Sampling Date		2022/02/25		
COC Number		865600-01-01		
	UNITS	TRIP BLANKS	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	7855690
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7857616
Benzene	ug/L	<0.20	0.20	7857616
Bromodichloromethane	ug/L	<0.50	0.50	7857616
Bromoform	ug/L	<1.0	1.0	7857616
Bromomethane	ug/L	<0.50	0.50	7857616
Carbon Tetrachloride	ug/L	<0.19	0.19	7857616
Chlorobenzene	ug/L	<0.20	0.20	7857616
Chloroform	ug/L	<0.20	0.20	7857616
Dibromochloromethane	ug/L	<0.50	0.50	7857616
1,2-Dichlorobenzene	ug/L	<0.40	0.40	7857616
1,3-Dichlorobenzene	ug/L	<0.40	0.40	7857616
1,4-Dichlorobenzene	ug/L	<0.40	0.40	7857616
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7857616
1,1-Dichloroethane	ug/L	<0.20	0.20	7857616
1,2-Dichloroethane	ug/L	<0.49	0.49	7857616
1,1-Dichloroethylene	ug/L	<0.20	0.20	7857616
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7857616
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7857616
1,2-Dichloropropane	ug/L	<0.20	0.20	7857616
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7857616
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7857616
Ethylbenzene	ug/L	<0.20	0.20	7857616
Ethylene Dibromide	ug/L	<0.19	0.19	7857616
Hexane	ug/L	<1.0	1.0	7857616
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7857616
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7857616
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7857616
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7857616
Styrene	ug/L	<0.40	0.40	7857616
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7857616
1,1,2,2-Tetrachloroethane	ug/L	<0.40	0.40	7857616
Tetrachloroethylene	ug/L	<0.20	0.20	7857616
Toluene	ug/L	<0.20	0.20	7857616
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7857616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS (WATER)

Bureau Veritas ID		RYK995		
Sampling Date		2022/02/25		
COC Number		865600-01-01		
	UNITS	**TRIP BLANKS**	**RDL**	**QC Batch**
1,1,2-Trichloroethane	ug/L	<0.40	0.40	7857616
Trichloroethylene	ug/L	<0.20	0.20	7857616
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7857616
Vinyl Chloride	ug/L	<0.20	0.20	7857616
p+m-Xylene	ug/L	<0.20	0.20	7857616
o-Xylene	ug/L	<0.20	0.20	7857616
Total Xylenes	ug/L	<0.20	0.20	7857616
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	93		7857616
D4-1,2-Dichloroethane	%	108		7857616
D8-Toluene	%	90		7857616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

TEST SUMMARY

Bureau Veritas ID: RYK989 **Collected:** 2022/02/25
Sample ID: 22-1 **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855406	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/02	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7860698	2022/03/02	2022/03/03	Suleeqa Nurr
Dissolved Metals by ICPMS	ICP/MS	7857170	N/A	2022/03/02	Nan Raykha
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7860689	2022/03/02	2022/03/03	Jonghan Yoon
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7854575	N/A	2022/03/01	Xueming Jiang

Bureau Veritas ID: RYK990 **Collected:** 2022/02/25
Sample ID: 22-2 **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855406	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/02	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7860698	2022/03/02	2022/03/03	Suleeqa Nurr
Dissolved Metals by ICPMS	ICP/MS	7857170	N/A	2022/03/02	Nan Raykha
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7860689	2022/03/02	2022/03/03	Jonghan Yoon
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7854575	N/A	2022/03/01	Xueming Jiang

Bureau Veritas ID: RYK991 **Collected:** 2022/02/25
Sample ID: 22-3 **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855406	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/02	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7860698	2022/03/02	2022/03/03	Suleeqa Nurr
Dissolved Metals by ICPMS	ICP/MS	7857170	N/A	2022/03/02	Nan Raykha
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7860689	2022/03/02	2022/03/03	Jonghan Yoon
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7854575	N/A	2022/03/01	Xueming Jiang

Bureau Veritas ID: RYK992 **Collected:** 2022/02/25
Sample ID: 22-4 **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855406	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/02	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7860698	2022/03/02	2022/03/03	Suleeqa Nurr
Dissolved Metals by ICPMS	ICP/MS	7857170	N/A	2022/03/02	Nan Raykha
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7860689	2022/03/02	2022/03/03	Jonghan Yoon
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7854575	N/A	2022/03/01	Xueming Jiang

TEST SUMMARY

Bureau Veritas ID: RYK993 **Collected:** 2022/02/25
Sample ID: 22-5 **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855406	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/02	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7860698	2022/03/02	2022/03/03	Suleeqa Nurr
Dissolved Metals by ICPMS	ICP/MS	7857170	N/A	2022/03/02	Nan Raykha
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7860689	2022/03/02	2022/03/03	Jonghan Yoon
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7854575	N/A	2022/03/01	Xueming Jiang

Bureau Veritas ID: RYK994 **Collected:** 2022/02/25
Sample ID: DUP **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7855406	N/A	2022/03/03	Automated Statchk
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7860698	2022/03/02	2022/03/03	Suleeqa Nurr
Dissolved Metals by ICPMS	ICP/MS	7857170	N/A	2022/03/02	Nan Raykha
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7860689	2022/03/02	2022/03/03	Jonghan Yoon
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7854575	N/A	2022/03/04	Xueming Jiang

Bureau Veritas ID: RYK995 **Collected:** 2022/02/25
Sample ID: TRIP BLANKS **Shipped:**
Matrix: Ground Water **Received:** 2022/02/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7855690	N/A	2022/03/02	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	7857616	N/A	2022/03/02	Manpreet Sarao

GENERAL COMMENTS

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

Package 1	6.7°C

Sample 22-5 dissolved metals analysis run with sediment present after field filtration
Samples 22-2 and 22-4 F2-F4 bottles decanted priot to analysis due to sediment >1cm

Sample RYK993 [22-5] : Preserved samples contained visible sediment. Results may be biased high due to analytes leaching from sediment.

Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Results relate only to the items tested.

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7854575	4-Bromofluorobenzene	2022/03/01	95	70 - 130	94	70 - 130	90	%		
7854575	D4-1,2-Dichloroethane	2022/03/01	118	70 - 130	115	70 - 130	116	%		
7854575	D8-Toluene	2022/03/01	104	70 - 130	105	70 - 130	99	%		
7857616	4-Bromofluorobenzene	2022/03/02	104	70 - 130	103	70 - 130	98	%		
7857616	D4-1,2-Dichloroethane	2022/03/02	102	70 - 130	98	70 - 130	108	%		
7857616	D8-Toluene	2022/03/02	103	70 - 130	104	70 - 130	91	%		
7860689	D10-Anthracene	2022/03/02	83	50 - 130	96	50 - 130	93	%		
7860689	D14-Terphenyl (FS)	2022/03/02	80	50 - 130	100	50 - 130	92	%		
7860689	D8-Acenaphthylene	2022/03/02	82	50 - 130	84	50 - 130	77	%		
7860698	o-Terphenyl	2022/03/03	96	60 - 130	99	60 - 130	97	%		
7854575	1,1,1,2-Tetrachloroethane	2022/03/01	101	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
7854575	1,1,1-Trichloroethane	2022/03/01	103	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
7854575	1,1,2,2-Tetrachloroethane	2022/03/01	104	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
7854575	1,1,2-Trichloroethane	2022/03/01	121	70 - 130	114	70 - 130	<0.50	ug/L	NC	30
7854575	1,1-Dichloroethane	2022/03/01	98	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
7854575	1,1-Dichloroethylene	2022/03/01	105	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
7854575	1,2-Dichlorobenzene	2022/03/01	99	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
7854575	1,2-Dichloroethane	2022/03/01	111	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
7854575	1,2-Dichloropropane	2022/03/01	96	70 - 130	92	70 - 130	<0.20	ug/L	NC	30
7854575	1,3-Dichlorobenzene	2022/03/01	97	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7854575	1,4-Dichlorobenzene	2022/03/01	111	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
7854575	Acetone (2-Propanone)	2022/03/01	110	60 - 140	105	60 - 140	<10	ug/L	1.5	30
7854575	Benzene	2022/03/01	94	70 - 130	90	70 - 130	<0.17	ug/L	2.3	30
7854575	Bromodichloromethane	2022/03/01	103	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
7854575	Bromoform	2022/03/01	95	70 - 130	89	70 - 130	<1.0	ug/L	NC	30
7854575	Bromomethane	2022/03/01	109	60 - 140	102	60 - 140	<0.50	ug/L	NC	30
7854575	Carbon Tetrachloride	2022/03/01	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7854575	Chlorobenzene	2022/03/01	99	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7854575	Chloroform	2022/03/01	106	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
7854575	cis-1,2-Dichloroethylene	2022/03/01	100	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
7854575	cis-1,3-Dichloropropene	2022/03/01	84	70 - 130	78	70 - 130	<0.30	ug/L	NC	30
7854575	Dibromochloromethane	2022/03/01	100	70 - 130	95	70 - 130	<0.50	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
7854575	Dichlorodifluoromethane (FREON 12)	2022/03/01	89	60 - 140	88	60 - 140	<1.0	ug/L	NC	30
7854575	Ethylbenzene	2022/03/01	92	70 - 130	87	70 - 130	<0.20	ug/L	1.1	30
7854575	Ethylene Dibromide	2022/03/01	100	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7854575	F1 (C6-C10) - BTEX	2022/03/01					<25	ug/L	NC	30
7854575	F1 (C6-C10)	2022/03/01	101	60 - 140	94	60 - 140	<25	ug/L	NC	30
7854575	Hexane	2022/03/01	100	70 - 130	96	70 - 130	<1.0	ug/L	NC	30
7854575	Methyl Ethyl Ketone (2-Butanone)	2022/03/01	106	60 - 140	101	60 - 140	<10	ug/L	NC	30
7854575	Methyl Isobutyl Ketone	2022/03/01	93	70 - 130	89	70 - 130	<5.0	ug/L	NC	30
7854575	Methyl t-butyl ether (MTBE)	2022/03/01	86	70 - 130	83	70 - 130	<0.50	ug/L	NC	30
7854575	Methylene Chloride(Dichloromethane)	2022/03/01	102	70 - 130	97	70 - 130	<2.0	ug/L	NC	30
7854575	o-Xylene	2022/03/01	91	70 - 130	86	70 - 130	<0.20	ug/L	2.1	30
7854575	p+m-Xylene	2022/03/01	94	70 - 130	86	70 - 130	<0.20	ug/L	0.89	30
7854575	Styrene	2022/03/01	96	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
7854575	Tetrachloroethylene	2022/03/01	98	70 - 130	92	70 - 130	<0.20	ug/L	1.9	30
7854575	Toluene	2022/03/01	99	70 - 130	91	70 - 130	<0.20	ug/L	0.57	30
7854575	Total Xylenes	2022/03/01					<0.20	ug/L	1.3	30
7854575	trans-1,2-Dichloroethylene	2022/03/01	105	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7854575	trans-1,3-Dichloropropene	2022/03/01	99	70 - 130	91	70 - 130	<0.40	ug/L	NC	30
7854575	Trichloroethylene	2022/03/01	100	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7854575	Trichlorofluoromethane (FREON 11)	2022/03/01	116	70 - 130	112	70 - 130	<0.50	ug/L	NC	30
7854575	Vinyl Chloride	2022/03/01	91	70 - 130	90	70 - 130	<0.20	ug/L	NC	30
7857170	Dissolved Antimony (Sb)	2022/03/02	108	80 - 120	106	80 - 120	<0.50	ug/L	18	20
7857170	Dissolved Arsenic (As)	2022/03/02	100	80 - 120	98	80 - 120	<1.0	ug/L	2.2	20
7857170	Dissolved Barium (Ba)	2022/03/02	100	80 - 120	102	80 - 120	<2.0	ug/L	3.8	20
7857170	Dissolved Beryllium (Be)	2022/03/02	103	80 - 120	102	80 - 120	<0.40	ug/L	NC	20
7857170	Dissolved Boron (B)	2022/03/02	NC	80 - 120	100	80 - 120	<10	ug/L	0.50	20
7857170	Dissolved Cadmium (Cd)	2022/03/02	103	80 - 120	102	80 - 120	<0.090	ug/L	NC	20
7857170	Dissolved Chromium (Cr)	2022/03/02	95	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7857170	Dissolved Cobalt (Co)	2022/03/02	96	80 - 120	98	80 - 120	<0.50	ug/L	5.2	20
7857170	Dissolved Copper (Cu)	2022/03/02	100	80 - 120	100	80 - 120	<0.90	ug/L	6.1	20
7857170	Dissolved Lead (Pb)	2022/03/02	95	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7857170	Dissolved Molybdenum (Mo)	2022/03/02	107	80 - 120	104	80 - 120	<0.50	ug/L	0.55	20

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7857170	Dissolved Nickel (Ni)	2022/03/02	92	80 - 120	94	80 - 120	<1.0	ug/L	10	20
7857170	Dissolved Selenium (Se)	2022/03/02	99	80 - 120	100	80 - 120	<2.0	ug/L	NC	20
7857170	Dissolved Silver (Ag)	2022/03/02	84	80 - 120	104	80 - 120	<0.090	ug/L	NC	20
7857170	Dissolved Sodium (Na)	2022/03/02	NC	80 - 120	97	80 - 120	<100	ug/L	2.0	20
7857170	Dissolved Thallium (Tl)	2022/03/02	98	80 - 120	100	80 - 120	<0.050	ug/L	NC	20
7857170	Dissolved Uranium (U)	2022/03/02	95	80 - 120	97	80 - 120	<0.10	ug/L	2.1	20
7857170	Dissolved Vanadium (V)	2022/03/02	99	80 - 120	97	80 - 120	<0.50	ug/L	6.0	20
7857170	Dissolved Zinc (Zn)	2022/03/02	97	80 - 120	96	80 - 120	<5.0	ug/L	3.2	20
7857616	1,1,1,2-Tetrachloroethane	2022/03/02	103	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
7857616	1,1,1-Trichloroethane	2022/03/02	101	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
7857616	1,1,2,2-Tetrachloroethane	2022/03/02	102	70 - 130	98	70 - 130	<0.40	ug/L	NC	30
7857616	1,1,2-Trichloroethane	2022/03/02	102	70 - 130	100	70 - 130	<0.40	ug/L	NC	30
7857616	1,1-Dichloroethane	2022/03/02	95	70 - 130	97	70 - 130	<0.20	ug/L	10	30
7857616	1,1-Dichloroethylene	2022/03/02	96	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7857616	1,2-Dichlorobenzene	2022/03/02	96	70 - 130	97	70 - 130	<0.40	ug/L	NC	30
7857616	1,2-Dichloroethane	2022/03/02	96	70 - 130	94	70 - 130	<0.49	ug/L	NC	30
7857616	1,2-Dichloropropane	2022/03/02	101	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
7857616	1,3-Dichlorobenzene	2022/03/02	93	70 - 130	95	70 - 130	<0.40	ug/L	NC	30
7857616	1,4-Dichlorobenzene	2022/03/02	109	70 - 130	112	70 - 130	<0.40	ug/L	NC	30
7857616	Acetone (2-Propanone)	2022/03/02	107	60 - 140	102	60 - 140	<10	ug/L	NC	30
7857616	Benzene	2022/03/02	94	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7857616	Bromodichloromethane	2022/03/02	102	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
7857616	Bromoform	2022/03/02	106	70 - 130	103	70 - 130	<1.0	ug/L	NC	30
7857616	Bromomethane	2022/03/02	105	60 - 140	104	60 - 140	<0.50	ug/L	NC	30
7857616	Carbon Tetrachloride	2022/03/02	99	70 - 130	102	70 - 130	<0.19	ug/L	NC	30
7857616	Chlorobenzene	2022/03/02	98	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7857616	Chloroform	2022/03/02	98	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
7857616	cis-1,2-Dichloroethylene	2022/03/02	103	70 - 130	104	70 - 130	<0.50	ug/L	3.8	30
7857616	cis-1,3-Dichloropropene	2022/03/02	99	70 - 130	94	70 - 130	<0.30	ug/L	NC	30
7857616	Dibromochloromethane	2022/03/02	101	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
7857616	Dichlorodifluoromethane (FREON 12)	2022/03/02	81	60 - 140	91	60 - 140	<1.0	ug/L	NC	30
7857616	Ethylbenzene	2022/03/02	89	70 - 130	93	70 - 130	<0.20	ug/L	NC	30

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7857616	Ethylene Dibromide	2022/03/02	102	70 - 130	99	70 - 130	<0.19	ug/L	NC	30
7857616	Hexane	2022/03/02	100	70 - 130	104	70 - 130	<1.0	ug/L	NC	30
7857616	Methyl Ethyl Ketone (2-Butanone)	2022/03/02	116	60 - 140	111	60 - 140	<10	ug/L	NC	30
7857616	Methyl Isobutyl Ketone	2022/03/02	113	70 - 130	110	70 - 130	<5.0	ug/L	NC	30
7857616	Methyl t-butyl ether (MTBE)	2022/03/02	95	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
7857616	Methylene Chloride(Dichloromethane)	2022/03/02	101	70 - 130	100	70 - 130	<2.0	ug/L	NC	30
7857616	o-Xylene	2022/03/02	89	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7857616	p+m-Xylene	2022/03/02	97	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
7857616	Styrene	2022/03/02	106	70 - 130	111	70 - 130	<0.40	ug/L	NC	30
7857616	Tetrachloroethylene	2022/03/02	92	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7857616	Toluene	2022/03/02	96	70 - 130	98	70 - 130	<0.20	ug/L	4.2	30
7857616	Total Xylenes	2022/03/02					<0.20	ug/L	NC	30
7857616	trans-1,2-Dichloroethylene	2022/03/02	99	70 - 130	101	70 - 130	<0.50	ug/L	8.3	30
7857616	trans-1,3-Dichloropropene	2022/03/02	108	70 - 130	98	70 - 130	<0.40	ug/L	NC	30
7857616	Trichloroethylene	2022/03/02	104	70 - 130	107	70 - 130	<0.20	ug/L	5.0	30
7857616	Trichlorofluoromethane (FREON 11)	2022/03/02	99	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
7857616	Vinyl Chloride	2022/03/02	100	70 - 130	105	70 - 130	<0.20	ug/L	5.9	30
7860689	1-Methylnaphthalene	2022/03/02	84	50 - 130	84	50 - 130	<0.050	ug/L	NC	30
7860689	2-Methylnaphthalene	2022/03/02	82	50 - 130	81	50 - 130	<0.050	ug/L	NC	30
7860689	Acenaphthene	2022/03/02	86	50 - 130	85	50 - 130	<0.050	ug/L	NC	30
7860689	Acenaphthylene	2022/03/02	82	50 - 130	80	50 - 130	<0.050	ug/L	NC	30
7860689	Anthracene	2022/03/02	86	50 - 130	90	50 - 130	<0.050	ug/L	NC	30
7860689	Benzo(a)anthracene	2022/03/02	86	50 - 130	87	50 - 130	<0.050	ug/L	NC	30
7860689	Benzo(a)pyrene	2022/03/02	86	50 - 130	89	50 - 130	<0.0090	ug/L	NC	30
7860689	Benzo(b/j)fluoranthene	2022/03/02	88	50 - 130	95	50 - 130	<0.050	ug/L	NC	30
7860689	Benzo(g,h,i)perylene	2022/03/02	85	50 - 130	90	50 - 130	<0.050	ug/L	NC	30
7860689	Benzo(k)fluoranthene	2022/03/02	85	50 - 130	83	50 - 130	<0.050	ug/L	NC	30
7860689	Chrysene	2022/03/02	92	50 - 130	97	50 - 130	<0.050	ug/L	NC	30
7860689	Dibenzo(a,h)anthracene	2022/03/02	72	50 - 130	74	50 - 130	<0.050	ug/L	NC	30
7860689	Fluoranthene	2022/03/02	103	50 - 130	105	50 - 130	<0.050	ug/L	NC	30
7860689	Fluorene	2022/03/02	92	50 - 130	92	50 - 130	<0.050	ug/L	NC	30
7860689	Indeno(1,2,3-cd)pyrene	2022/03/02	84	50 - 130	91	50 - 130	<0.050	ug/L	NC	30

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7860689	Naphthalene	2022/03/02	75	50 - 130	75	50 - 130	<0.050	ug/L	NC	30
7860689	Phenanthrene	2022/03/02	94	50 - 130	96	50 - 130	<0.030	ug/L	NC	30
7860689	Pyrene	2022/03/02	100	50 - 130	103	50 - 130	<0.050	ug/L	NC	30
7860698	F2 (C10-C16 Hydrocarbons)	2022/03/03	105	60 - 130	111	60 - 130	<100	ug/L	NC	30
7860698	F3 (C16-C34 Hydrocarbons)	2022/03/03	106	60 - 130	110	60 - 130	<200	ug/L	NC	30
7860698	F4 (C34-C50 Hydrocarbons)	2022/03/03	104	60 - 130	111	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 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).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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