GOLDER
MEMBER OF WSP

FINAL REPORT

Phase Two Environmental Site Assessment

New Civic Development for the Ottawa Hospital - Parkade

Submitted to:

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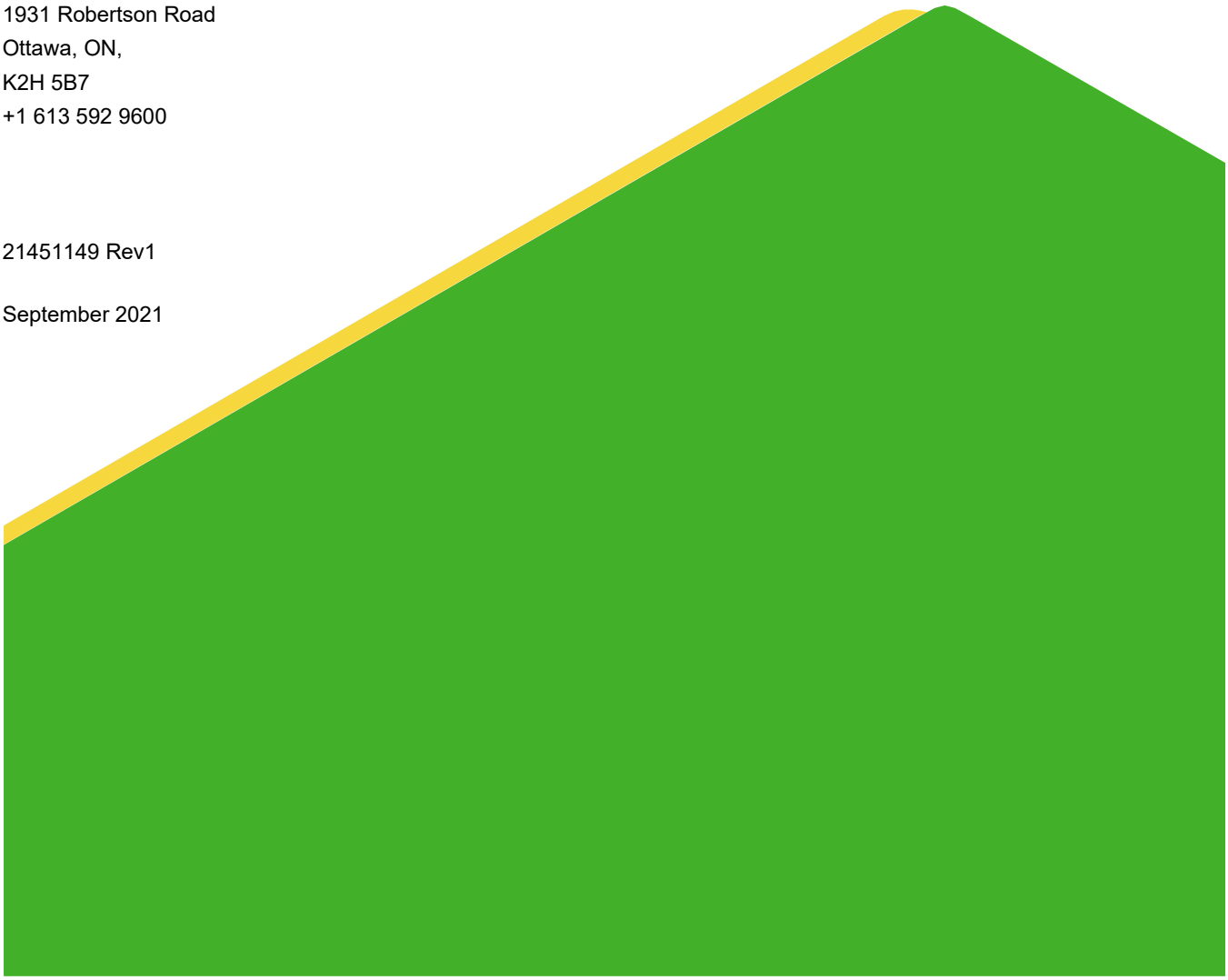

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Record of Issue

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Parsons Inc.	Ronald Clarke	Rev 0	July 23, 2021	Draft for client review
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1.0 EXECUTIVE SUMMARY

Golder Associated Ltd. (Golder) was retained by Parsons Inc. (Parsons) on behalf of the Ottawa Hospital to conduct two Phase Two Environmental Site Assessments (ESA) of the property located at the southwest corner of Preston Street and Carling Avenue, Ottawa, Ontario (the "Site" or the "Phase Two Property"). The location of the Phase Two Property is provided in Figure 1. The legal description of the Phase Two Property is: Part of Lot 1, Concession BRF, Part 1 of Registered Plan 5R14003.

Golder previously completed a Phase One ESA for the Site, the results of which were documented in the report titled "*Phase One Environmental Site Assessment, The Ottawa Hospital - New Civic Campus*", dated March 2021 (file number 19127064). Based on the findings of the Phase One ESA, Golder completed this Phase Two ESA investigation.

The analytical results from the 2021 sampling and analysis program indicate that the reported concentrations of polycyclic aromatic hydrocarbons (PAHs) in three soil samples, vanadium in one soil sample, electrical conductivity in one soil sample, sodium and chloride in one groundwater sample, and chloroform in two groundwater samples did not meet the applicable Ministry of Environment, Conservation and Parks (MECP) Table 7 site condition standards. The reported concentrations of all other parameters tested in soil and groundwater were below the Table 7 generic site condition standards for commercial property use with coarse soil texture and non-potable groundwater.

The PAH soils impacts identified across the Site appear to be the result of former site use as a landfill and demolition debris from the previous presence of buildings on Site. The vanadium impacts in the one soil sample are within the range of concentrations found within local area clays and is likely attributed to the natural background. The sodium and chloride impacts identified for groundwater and electrical conductivity in the one soil sample at the Site are expected to be related to road salt use within the parking area, however, it is noted that impacts associated with the application of salt for safety purposes are not considered to represent an exceedance of the standard. The slight chloroform exceedances identified for groundwater Site are expected be due to the use of tap water during rock coring for these boreholes and will not likely be persistent. As such, groundwater at the Phase Two Property meets the applicable site condition standards.

Impacts identified in current and historic soil samples are not considered to present a contaminant mass contributing to groundwater contamination. This is supported by no COCs identified in soil samples being present above regulatory guidelines in groundwater samples. It is anticipated that the identified soil impacts which are within fill materials which will be removed during soil excavation activities related to the development of the parkade structure.

Contaminants of concern identified in groundwater at the Site (chloride, sodium, and chloroform) appear to be related to localized short-term activities (drilling) or due to the application of salt for safety purpose which is not considered an exceedance and are not to the identified APECs. Thus, contaminant migration in groundwater is not expected to be an issue of concern for the Site.

Based on the results of the soil and groundwater samples submitted as part of this Phase Two ESA, remediation of PAH impacts in the fill material is recommended prior to redevelopment into a commercial parkade.

2.0 INTRODUCTION

2.1 Site Description

Golder was retained by Parsons to conduct a Phase Two ESA of the Phase Two Property. Authorization to proceed with this investigation was received from Ronald Clarke of Parsons on March 30, 2021The property is comprised of two parcels of land, as indicated below.

- Parcel A, a stand-alone municipal parcel located at 520 Preston Street which is owned by Public Service and Procurement Canada (PSPC) and is leased to the Ottawa Hospital and consists of a commercial parking lot associated with Dow's Pavilion and a landscaped area; and
- Parcel B, a portion of the parcel of land located at 930 Carling Avenue which owned by PSPC and is leased to the Ottawa Hospital and consists of the Queen Juliana Park. It is separated from Parcel A by railway tracks associated with the O-Train.

The location of the Phase Two Property, including property boundaries, is provided in Figure 1. It is noted that the proposed parkade structure will connect the two parcels by passing over the rail corridor but for the purpose of the Phase Two ESA, the rail corridor is off-Site. The legal description of the Phase Two Property is provided below.

	520 Preston Street and Part of 930 Carling Avenue, Ottawa, Ontario
Property Identification Number	Part of PIN 04088-0001(LT) and 04088-0002(LT)
Legal Description	Part of Lot 1, Concession BRF, Part 1 of Registered Plan 5R14003
Size of the Phase Two Property	4.39 ha

2.2 Current and Proposed Future Uses

The current land use of the Phase Two Property is commercial (520 Preston Street) and parkland (930 Carling Avenue). Parcel A consists of a commercial parking lot associated with Dow's Pavilion and a landscaped area, and Parcel B consists of the Queen Juliana Park.

The proposed future use of the Phase Two Property is commercial; Golder understands the Site is to be developed as a parking structure with a green roof for the Ottawa Hospital. No Record of Site Condition (RSC) is required for the Phase Two Property as the intended land use as a parking structure is not considered a change to a more sensitive land use.

2.3 Applicable Site Condition Standard

The analytical results of the samples collected for this Phase Two ESA were compared to the Table 7 generic site condition standards (commercial property use, coarse soil texture, non-potable groundwater) presented in the MECP document "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", dated 15 April 2011. The applicable site condition standards were selected based on the following rationale:

- The Phase Two Property is supplied by the City of Ottawa municipal drinking water system. No wells were identified on Site or on neighbouring properties 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;
- There are no known areas of natural significance located on or within 30 meters of the Phase Two Property, as described in Section 41;
- Based on the present and prior environmental site investigations, there is less than 2 m of overburden above bedrock on over one-third of the Site;
- Based on field observations and prior environmental site investigations the overburden at the Site is considered to be coarse textured;
- The nearest permanent watercourse is the Dow's Lake located approximately 50 m east of Parcel A;
- The pH of shallow fill was reported to be outside the acceptable range of 5≤pH≤9, in one sample of fill. Given the fill is expected to be removed as part of the parkade construction and the pH of sub-surface soil meets the requirement that 5≤pH≤11, it is not considered a sensitive site as a result of the pH; and
- The intended use for the Phase Two Property is commercial.

3.0 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. 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.

3.1 Physical Setting

The nearest surface water body is the Dow's Lake, located approximately 50 m east of the northeastern boundary of the Phase Two Property. There are no known areas of natural significance located on or within 30 meters of the Phase Two Property. Land uses surrounding the Phase Two Property are residential and commercial, as shown on Figure 2.

The topography of the Phase Two Property and surrounding areas is generally flat with slight downward slope toward Dow's Lake in the northeast; there is a steep slope along on the southwestern boundary of Parcel B and rail tracks cut through bedrock between Parcels A and B. Storm water either infiltrates through landscaped or unfinished surfaces or is directed toward catch basins located on the paved portion of the Site. Golder understands that the rail tracks intercept groundwater locally.

3.2 Past Investigations

3.2.1 Phase One ESA

Golder conducted a Phase One ESA entitled, "*Phase One Environmental Site Assessment, The Ottawa Hospital-New Civic Campus*", dated April 2020, 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 records and investigations of the Site and surrounding area, interviews with persons familiar with the Site, and a Site reconnaissance. The APECs and associated COCs identified in the 2020 Phase One ESA which are relevant to the Site are summarized below.

APEC	Description	COCs
APEC 1: Former Dow's Lake Landfill	Former Dow's Lake Landfill at Parcel A. No municipal solid waste noted at the Site during previous investigations (landfilled material limited to soil and demolition debris). Fill of unknown quality.	PHCs[1], BTEX, VOCs, PAHs, Metals, and Inorganics
APEC 2: Demolition debris from former office building	Demolition debris from the demolition of a former office building on Parcel B with documented PAH (federal guidelines) and metals (federal guidelines and provincial standards) impacts within the fill layer.	PHCs, BTEX, PAHs, Metals, and Inorganics
APEC 3: Imported fill materials of unknown quality	Unknown quality of imported fill materials associated with various building construction and site development activities across the Site.	PHCs, BTEX, PAHs, Metals, and Inorganics

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

During completion of the Phase One ESA, Golder reviewed the following reports which were partially or completely related to the Site to develop an understanding of the environmental conditions at the Site and surrounding properties. Analytical results from these reports were, in part, relied upon in making conclusions regarding presence of contamination relating to identified APECs to the Site. Which data was relied upon will be discusses in the Conceptual Site Model (Section 6.10).

- **"Phase I/II ESA for Dow's Lake Landfill",** *Phase I/II Environmental Site Assessment, Former Dow's Lake Landfill, National Capital Commission Property Asset #784 Ottawa, Ontario,* dated January 2004, prepared by INTERA Engineering Ltd. for NCC.
- **"Screening Level Risk Assessment",** *Screening Level Risk Assessment, Former Dow's Lake Landfill and Commissioner's Park, NCC Property Assets #96654 and #784 Ottawa, Ontario,* dated October 2005, prepared by INTERA Engineering Ltd. for NCC.
- **"Supplemental Phase II ESA for Dow's Lake Landfill",** *Supplemental Phase II Environmental Site Assessment, Former Dow's Lake Landfill, National Capital Commission Property Assets #784 Ottawa, Ontario,* dated November 2004, prepared by INTERA Engineering Ltd. for NCC.

[1] The following abbreviations are used in the table above: petroleum hydrocarbon fractions F1-F4 (PHCs), benzene, toluene, ethylbenzene, and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs).

- **"2017 Phase II ESA",** *Phase II Environmental Site Assessment, New Ottawa Hospital Civic Campus, Ottawa ON,* dated September 2017, prepared by Stantec Consulting Ltd. for PSPC.
- **"2017 Paterson ESA",** *Environmental Investigation of Subsurface Conditions, Proposed New Hospital Campus, Former Sir John Carling Building Complex, Central Experimental Farm, Ottawa ON,* dated September 2017, prepared by Paterson Group Inc. for Cleland Jardine Engineering Ltd.

Phase I/II ESA for Dow's Lake Landfill

This investigation consisted of a Phase I ESA and Phase II ESA for Parcel A. The Phase I ESA was conducted to determine the potential environmental liability with subsequent Phase II ESA completed to evaluate presence of soil and groundwater contamination resulting from former landfill activities. Noteworthy findings from review of this report are discussed below:

- Findings of the Phase I ESA identified that Parcel A was used as a landfill prior to 1924. No other issues of significant environmental concern were identified.
- As part of the Phase II ESA, six boreholes (BH1 through BH6) were completed with three extended into bedrock (approximately 6 mbgs) to install monitoring wells. Overburden soil consisted of predominantly sandy fill material with some wood waste.
- Soil samples were analyzed for one or more of Total Petroleum Hydrocarbon (TPHs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and/or metals. One sample, collected from 0.8-2.1 meter below ground surface (mbgs), collected from BH5 exceeded Canadian Council of Ministers of the Environment (CCME) criteria for benzo[a]anthracene and benzo[b]fluoranthene, and exceeded both CCME and Ministry of Environmental (now Ministry of the Environment, Conservation and Parks (MECP)) criteria at that time for benzo[a]pyrene. No other exceedances in soil samples were identified.
- Groundwater samples were analyzed for TPH, VOCs, PAHs general chemistry and/or metals from two monitoring wells. Samples from both wells exceeded applicable CCME standards for sulphate, manganese and sodium. No MECP exceedances were identified.
- The analytical results for soil and groundwater indicated poor quality fill material in Parcel A as well as salt application to the parking lot on Parcel A.
- Additional boreholes were recommended to conduct soil sampling for investigating extent of PAH impacts and groundwater sampling to identify potential discharge of contaminants into Dow's Lake.

Supplemental Phase II ESA for Dow's Lake Landfill

This investigation was completed for Parcel A of the Site, formerly occupied by the Dow's Lake Landfill, to investigate soil and groundwater quality. Noteworthy findings from review of this report are discussed below:

- A total of six boreholes (not installed with monitoring wells) were advanced to inferred bedrock refusal encountered approximately 3 mbgs. Overburden soil consisted primarily of fill materials including sand and gravel with wood waste and some sandy silt layers. No groundwater wells were installed based on previous groundwater quality results from adjacent property down-gradient of Parcel A.

- Soil samples collected from each borehole were tested for PAHs. A single sample, 04-BH6-2, (out of total nine analyzed), collected from a depth of 0.61 to 1.22 mbgs, exceeded CCME criteria for benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene, indeno[1,2,3-c,d]pyrene, naphthalene, and phenanthrene, as well as exceeded both CCME and MECP criteria for benzo[a]pyrene at that time.
- Existing monitoring wells, completed as part of previous investigations, were used to take water level measurements which indicated that groundwater flow was southwest towards the railway tracks. Given groundwater flow was expected towards Dow's Lake (to the east), it was inferred that rail tracks cut through bedrock may influence shallow groundwater in this area.
- Recommendations made included:
  - Conduct an inspection and sampling of groundwater seeps along the OC Transpo rail line cut to address the issue of potential groundwater migration from the former landfill to the north-northwest.
  - Conduct annual groundwater monitoring at the former landfill and the downgradient Traffic Circle property for two years commencing August 2005, to monitor groundwater quality, and ensure stability of contaminants. Following two years of monitoring, decommissioning of the wells would likely be recommended.
  - Conduct a screening level risk assessment (SLRA) on the property to address the soil exceedances for various PAH parameters.

Screening Level Risk Assessment (SLRA)

This investigation was completed following soil and groundwater impacts identified at Parcel A (former Dow's Lake landfill) and adjacent property east of Preston Street, also known as Commissioners Park. Both these lands were owned by NCC and had known impacts of metal and PAH contamination in soil as well as groundwater. Noteworthy findings from the review of this report are discussed below:

- SLRA consisted of human health and ecological components. Supplementary sampling and testing of surficial soil, groundwater and surface water were undertaken as part of this investigation to augment the database of soil, groundwater and surface water quality for use in this SLRA.
- Subsurface conditions in the area were known, based on previous investigations, to consist of sandy fill, wood waste and other waste materials such as brick, glass, wood, asphalt, slag and ash.
- With regards to health hazards, detected contaminants (PAHs and metals) identified in soil were not inferred to pose unacceptable health risks to park visitors, parks construction workers or park maintenance workers.
- Ecological SLRA did not indicate that contaminants of concern (COC) in soil pose an unacceptable ecological health risk to terrestrial receptors.
- No indication of adverse effect to Dow's Lake water quality from contaminant transport by groundwater was observed, given available groundwater data at that time.
- Given, no unacceptable human health or ecological hazards and risks were identified to be posed by the presence of soil and groundwater contamination, no requirements for active intervention or other risk management was recommended.

2017 Phase II ESA

This investigation was conducted, for due-diligence purposes, following recommendation based on the findings of the 2017 Phase I ESA. Noteworthy findings of this assessment are discussed below:

- Ten boreholes were advanced with all ten being installed with monitoring wells. Six existing monitoring wells at the Site were also sampled for groundwater analysis. The overburden in the areas investigated at the Site generally consisted of topsoil fill/asphalt underlain by silt / silty sand. Bedrock or inferred bedrock was encountered at depths ranging from 0.91 to 5.49 mbgs.
- Exceedances of CCME guidelines for some PAH concentrations were found in three locations and some metal exceedances were found in two locations. This indicated poor quality of imported fill materials, given these were observed in shallow soil samples (within top 1.5 mbgs). The metal concentrations also exceeded applicable provincial regulatory standards. In addition, Electrical conductivity and pH values exceeded the provincial standards in one soil sample. There were additional exceedances of the provincial background standards.
- Groundwater flow in the shallow soil was interpreted to flow north towards Ottawa River, and may have been influenced by steep elevation drop on the northern portion of the Site. Thirteen groundwater samples were analyzed with exceedances of various metals and inorganic parameters above the applicable CCME guidelines with sodium being the only exceedance of the provincial standards.

2017 Paterson ESA

This investigation was conducted concurrently with a geotechnical investigation and included Parcel C (off site). A total of 13 boreholes, nine of which were installed with monitoring wells, were completed to a maximum depth of 11.2 mbgs. Noteworthy findings from review of this report are discussed below.

- Subsurface stratigraphy consisted of asphalt or topsoil overlying fill over glacial till deposit. Auger refusals were encountered at all borehole locations between 2.0 and 11.2 mbgs, indicating variable overburden thickness.
- A total of 12 soil samples were submitted for laboratory analysis of PHCs F1 to F4, BTEX and/or metals. Concentrations of vanadium above MECP Table 3 standards, and concentrations of barium, chromium and cobalt above MECP Table 1 were observed. Vanadium was linked to naturally occurring metals in the clay and was not a contaminant. It is noted that the investigation did not include PAH sampling in soil.
- Nine groundwater samples were analyzed for PHCs, BTEX and PAHs with no exceedance of MECP Table 1 or 3 standards for any parameters observed in any of the samples.

4.0 SCOPE OF THE INVESTIGATION

4.1 Overview of Site Investigation

The Phase Two ESA investigation activities were completed between April 28, 2021 and June 11, 2021 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 13 boreholes, 6 of which were completed as groundwater monitoring wells used for groundwater sampling at the Site. The rationale for the selected location of the boreholes is provided in the Sampling and Analysis Plan (SAP) provided in Appendix A. The locations of the boreholes and monitoring wells are provided on Figure 2. The monitoring well construction details are presented in Appended Table 1.
- **Soil Sampling**: Selected soil samples were collected between May 13, 2021 and June 11, 2021 from the boreholes. Soil samples were submitted for chemical analysis of one or more of the following: petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene, and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals, hydride-forming metals, and/or other regulated parameters (ORPs).
- **Groundwater Monitoring and Sampling**: Groundwater samples were collected on May 27, 2021. Groundwater samples were submitted for analysis of one or more of the following: PHCs, BTEX, PAHs, VOCs, metals, hydride-forming metals, and/or other regulated parameters.
- **Surveying**: An elevation survey for the boreholes and monitoring wells advanced as part of the Phase Two ESA investigation was completed on May 28, 2021 and June 25, 2021.
- **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.

4.2 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 Appended Tables 3 and 4. The SAP (Appendix A) 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.

4.3 Phase One Conceptual Site Model

A Conceptual Site Model (CSM) of the Site (as required by O.Reg. 153/04) is presented in the series of Figures 1 to 3 (Figure 1: Key Plan, Figure 2: Site Plan, Figure 3: Topographic Map and Areas of Natural Significance).

The combined set of figures shows the following for the Site:

- Existing buildings and structures (if present);
- Water bodies and Areas of Natural Significance (if present);
- Roads (including names); and
- Uses of properties adjacent to the Site.

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

- The Site, occupying approximately 4.39 ha (10.84 acres), consists of an irregular shaped parcel of land bounded by Carling Avenue (northwest), Preston Street (northeast), Prince of Wales Drive (southeast), and Sherwood Drive (southwest). Two land parcels (Parcel A and B) form the entire Site and are managed by separate entities.
- At the time of the Site visit, general features included parking lot associated with the Dow's Lake Pavilion on Parcel A and parkland (Queen Juliana Park) on Parcel B. No interior areas of any buildings or structure (former SJCB west annex, Bell building or Dara Tennis Club building) were accessible at the time of the Site visit. In addition, snow cover on the ground restricted visual observations of majority exterior areas other than asphalt paved roadways and parking area.
- Wells for monitoring and testing purposes were installed at the Site according to previous reports reviewed; however, were not observed at the time of the Site visit due to snow cover on the ground.
- The nearest permanent watercourse is the Dow’s Lake located approximately 50 m east of Parcel A of the Site. Based on previously completed subsurface investigations that evaluated groundwater flow direction based on water levels measured in groundwater monitoring wells, regional groundwater flows northward towards Ottawa River located approximately 2.75 km north of the Site. However, shallow groundwater flow may be influenced by the presence of Dow’s Lake to the northeast and O-Train rail tracks which cut through bedrock between Parcel A and B.
- Stratigraphy at the Site consists of till, plain with local relief (<5 m) on the northern portion of the Site. The depth to bedrock across the Site is variable and generally decreases from south to north. Typical bedrock depth for Parcel A is between 1 to 2 mbgs whereas Parcel B is between 5 to 10 mbgs.
- Based on previous subsurface investigations, stratigraphy primarily consisted of topsoil, fill or asphalt, underlain by sandy silt to silty clay.
- At the time of the Phase One ESA, the surrounding properties within the Phase One Study Area included:
  - **West**: Bounded by Carling Avenue Drive followed by government office buildings including Dominion Observatory as well as farming lands associated with Agriculture and Agri-Food Canada’s (AAFC) Central Experiment Farm (CEF).

- **North**: Bounded by Preston Street and Carling Avenue followed by parkland northeast (across Preston Street) and commercial land uses northwest (across Carling Avenue) of the Site.
- **South**: Bounded by Sherwood Drive followed by the vacant Sir John Carling Building (SJCB) West Annex, which was under demolition, a building occupied by Bell (Building 61), tennis courts with a clubhouse, and vacant landscaped area under the CEF.
- **East**: Bounded by Prince of Wales Drive followed by either Dow's Lake (east of Parcel A) and few government office buildings.

- A total of 21 potentially contaminating activities (PCAs) were identified within the Phase One Study Area, as shown on Figure 2. Based on site characteristics and the locations of these PCAs, a total of three APECs were identified for the Site (also shown on Figure 2).

4.4 Deviations from Sampling and Analysis Plan

The SAP, provided in Appendix A, 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. This plan, dated 11 May 2021, covers the activities undertaken during the Phase Two ESA. The procedures described in the SAP were generally followed with modifications as described below:

- Borehole BH21-05 was developed as a monitoring well and sampled instead of BH21-04 as bedrock coring was not completed at BH21-04;
- No groundwater sample was collected for MW17-1 as it could not be located and was presumed to be decommissioned;
- No groundwater sample or water level information was collected for BH21-01 because the well was dry at the time of sampling; and
- Only one soil duplicate sample was submitted due to low soil yields(1 in 17 samples); less than the recommended 1 duplicate sample per 10 primary samples.

No further material deviations from the SAP were identified in the course of the investigation. The deviations from the SAP are not expected to affect the completeness of the Site characterization.

4.5 Impediments

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

5.0 INVESTIGATION METHOD

5.1 General

The following sections describe the field investigation methodology employed during the Phase Two ESA. The field work was conducted between May 14 and June 11, 2021.

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. Health and safety tailgate meetings were 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.

5.2 Drilling

Between May 13, 2021 and June 11, 2021, 13 boreholes were advanced to depths of 1.02 to 7.27 metres below ground surface (mbgs). Borehole locations are provided in Figure 2. 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 George Downing Estate Drilling Ltd. (Downing) using a mobile CME-75 track mount 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 0.76 m intervals via the split-spoon method using a 0.61 m (2 ft) long, 5.08 cm (2 inch) diameter stainless steel split spoon sampling system. Split-spoons were decontaminated between sample locations.

Bedrock was encountered at 1.02 to 2.97 mbgs; thus, bedrock coring was completed for all boreholes other than BH21-01 and BH21-08. A 200 mm OD, 108 mm inner diameter (ID), hollow stem auger was used to advance the boreholes to bedrock. The cored portion of all boreholes other than BH21-07 was advanced using 91.82 mm OD NW casing and a 75.7 mm OD NQ core barrel. To facilitate geotechnical testing, the cored potion of BH21-07 was advanced using 117.48 mm OD HW casing, and a 96 mm OD HQ core barrel.

Monitoring wells were installed to straddle the water table within the bedrock unit with the exception of BH21-01, installed in the overburden, which was dry.

5.3 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. Field screening included describing the soil sample, and noting the presence of any staining, odour and/or debris. A photoionization detector (RKI Eagle 2) calibrated to hexane and isobutylene and operated in methane elimination mode was used to measure the total combustible gas and organic vapour concentration in the headspace in the sealed plastic bag.

As per the SAP, provided in Appendix A, 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, if available, was submitted for laboratory analysis to vertically delineate impacts. Due to shallow soils at the site, deeper samples were not available at most borehole locations.

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 Appended Table 4.

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

5.4 Field Screening Measurements

Field measurements of sample headspace concentration were made using the equipment listed below.

Equipment	Parameters Detected	Detection Limit	Precision	Accuracy	Calibration Standard
RKI Eagle 2	Combustible gas	0-50,000 ppm	NA	±5%	Hexane (1,650 ppm)
RKI Eagle 2	Total organic vapour	0-2,000 ppm	NA	±5%	Isobutylene (100 ppm)

Instruments were calibrated daily, with daily calibration checks, to known concentrations of hexane and isobutylene, were completed by Golder.

5.5 Groundwater: Monitoring Well Installation

Groundwater monitoring wells were installed by Downing using 32- or 38-mm ID Schedule 40 polyvinyl chloride (PVC) casing and 32- or 38-mm ID Schedule 40 PVC well screens (#10 slot size), which were brought to the Site in sealed plastic bags. The annular space was filled with #1, #2, or #3 silica filter sand to at least 30 cm above the well screen. The monitoring well was sealed with bentonite from the top of the sand pack and completed using a flush-mount (BH21-01) or stick-up (BH21-02 through BH21-10) casing. The riser pipes were sealed with a J-plug. Monitoring well installation details are provided in Appended Table 1. 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 on May 20 and 21, 2021 and June 11, 2021 in accordance with Golder Standard Operating Procedures (SOPs) by removing up to ten well volumes, or by purging to dry three times if the well was considered a “low yield” monitoring well, 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.

5.6 Groundwater: Field Measurements for Water Quality Parameters

Groundwater indicator parameters including turbidity, temperature, pH, conductivity, dissolved oxygen, and oxidation-reduction potential (ORP) were measured prior to sampling to ensure adequate well development and purging. A Horiba U-52 water quality meter was used to measure groundwater quality during monitoring well development and groundwater sampling. The instrument was calibrated using factory supplied solutions as specified in the table below. Field measurements are provided in Appended Table 2.

Equipment	Parameter	Detection Limit	Precision	Accuracy	Calibration Standard
Horiba U-52	Turbidity	0 to 800 NTU	0.1 NTU	± 5% of reading or ± 1 NTU	
Horiba U-52	Temperature	-5 to 50 °C	n/a	n/a	
Horiba U-52	pH	0 to 14 units	0.01/0.1 units	± 0.1 units	4.00 unit and 7.00 unit solution
Horiba U-52	Conductivity	0 to 100 mS/cm	0.1 mS/cm	± 1% of full scale	1.413 ms/cm solution
Horiba U-52	Dissolved Oxygen	0 to 50 mg/L	0.01 mg/L	±0.2 mg/L	
Horiba U-52	ORP	-2000 to 2000 mV	1 mV	± 15 mV	

5.7 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 or, where the well was considered a “low-yield” monitoring well, by purging at least one half of the well volume. Groundwater sampling was carried out on May 27, 2021.

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

5.8 Sediment: Sampling

No sediment samples were collected as part of this investigation.

5.9 Analytical Testing

The contact information for the analytical laboratory: AGAT Laboratories Inc.(AGAT), 5730 Coopers Avenue, Mississauga, Ontario, L4Z 2E9 (Hina Siddiqui, 905-712-5126).

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 MECP.

5.10 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.

5.11 Elevation Surveying

Elevations were determined relative to sea level, following calibration to the following benchmark:

- ON_Ottawa Base: easting: 372,181.260 m, northing: 5026,864.287 m. elevation: 95.231 masl, datum: NAD 1983 (Canadian Spatial Reference System 2010), Zone: Modified TM Zone 09, Geoid Model: CGVD 1928

5.12 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 frequency of 1 duplicate for every 17 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*", 1 July 2011. Samples were collected directly into pre-cleaned, laboratory-supplied sample containers with the appropriate preservative for the analyte group (if applicable). Upon collection, samples were placed in insulated coolers with ice for storage and transport to the analytical laboratory under chain-of-custody documentation;
- 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 sampling media 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.

A summary of the primary and duplicate samples collected between May 13 and 27, 2021 is shown below, for further detail, please refer to Appended Tables 3 and 4.

Submission Date	Media	Sample ID	Duplicate ID	Trip Blanks
21 May 2021	Soil	BH21-02 SA2, BH21-03 SA2, BH21-03 SA3, BH21-04 SA3, BH21-05 SA1, BH21-06 SA2, BH21-07 SA2, BH21-07 SA3, B21-11 SA1, BH21-13 SA1, BH21-13 SA3 **(12 samples)**	BH21-03 SA22	NA
28 May 2021	Soil	BH21-08 SA1, BH21-09 SA2, BH21-10 SA1, BH21-10 SA2, BH21-12 SA1 **(5 samples)**	NA	NA
22 June 2021	Soil	BH21-01 (**1 sample**)	NA	NA
27 May 2021	Groundwater	BH21-02, BH21-03, BH21-05, BH21-06, BH21-10, MW17-2 **(6 samples)**	DUP-3	Trip Blank

6.0 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.

6.1 Geology

The soil conditions encountered during the borehole drilling programs are presented in the Record of Borehole sheets provided in Appendix B, as well as in the cross-section presented in Figure 7. The subsurface soil conditions encountered during the investigation generally consisted of the following:

- Topsoil was generally encountered between ground surface and a maximum depth of 0.3 mbgs which consisted of brown to dark brown silty sand, sandy silt, or gravelly silty sand with organics. At BH21-01, concrete was encountered at ground surface to a maximum depth of 0.05 mbgs;
- Fill was encountered between 0.10 to depths ranging between 0.8 to 3.8 mbgs which consisted of brown, dark brown, or grey-brown silty sand, sandy silt, or gravelly silty sand; silty clay was encountered in BH21-13; black molting, cobble, brick, concrete, and other waste was observed in several boreholes;
- Glacial till was encountered between 1.5 and 1.7 mbgs at BH21-03 and 0.8 and 3.0 mbgs in BH21-13 which consisted of grey or grey-brown gravelly silty sand; native soils were not observed in any other boreholes;
- At BH21-05, concrete was encountered between 1.25 and 1.79 m bgs underlain by fill between 1.79 to 1.95 mbgs; and
- Bedrock was encountered at depths between 1.2 and 3.8 mbgs.

Based on the soil conditions encountered in the boreholes, the shaley limestone bedrock is considered to be an unconfined aquifer. Only one groundwater horizon was identified, ranging from 62.3 to 65.8 masl; the investigation was restricted to this aquifer.

6.2 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 location and depth of the screens for the six new monitoring wells (BH21-01, BH21-02, BH21-03, BH21-05, BH21-06, and BH21-10) were selected based on the APECs being investigated and to facilitate triangulation of groundwater flow direction on each side of the O-train rock cut. The wells were generally installed to straddle the water table however; due to not wishing to screen across distinct groundwater horizons (i.e., bedrock and overlying native or fill), screening of the water table was not possible at all locations. At BH21-01, groundwater was not encountered to a depth of investigation of 1.91 mbgs during drilling. A summary of the monitoring well construction details is presented in Appended Table 1. No evidence of petroleum hydrocarbon free product or sheen in groundwater was observed.

The groundwater elevations of at each monitoring well are summarized in Appended Table 3. Groundwater measurements ranged from 2.03 to 3.65 metres below top of pipe (mbtop) or between 62.30 to 65.82 metres above sea level (masl) on May 27, 2021. The measured groundwater elevations from May 27, 2001 are illustrated on Figure 4 along with the inferred direction of groundwater flow based on site topography and historical investigation results. Groundwater flow is expected to flow to the O-train rock cut which is dewatered from both Parcel A (southwest direction) and Parcel B (northeast direction).

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. At the time of groundwater sample collection (May 27, 2021), the saturated screen length at the sampled locations ranged from 1.66 m (BH21-03) to 3.30 m (BH21-05).

6.3 Groundwater: Hydraulic Gradients

The average horizontal hydraulic gradient was estimated for shallow groundwater conditions based on water levels collected on May 27, 2021. The horizontal hydraulic gradient for shallow groundwater conditions was 0.033 m/m along the majority of the site, with a less steep gradient of 0.022 m/m along the southern Site boundary.

Vertical hydraulic gradients were not calculated as no nested monitoring well pairs were installed.

6.4 Coarse 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. Further, prior sieve analysis results classified the soil texture at the Site as being coarse-grained (Stantec, 2016). Accordingly, soil at the Phase Two Property is considered to be coarse-textured.

6.5 Soil: Field Screening

Headspace vapour measurements were conducted on the soil samples collected from the borehole indicated in in the Record of Borehole sheets provided in Appendix B. Combustible gas vapour ranged from non-detect to 160 ppm, measured at BH21-13 between 1.52 - 2.13 mbgs, and organic vapour measurements ranged from non-detect to 1 ppm.

6.6 Soil: Quality

Appended Table 4 provides a summary of the soil samples submitted for analysis and the associated test parameters. The analytical results of soil samples are presented in Appended Tables 6a to 6e. Laboratory Certificates of Analysis for the soil samples are included in Appendix C.

Golder completed soil sampling at the Site during borehole advancement between May 13, 2021 and June 11, 2021. The soil samples were submitted to AGAT for analysis of one or more of the following parameters: metals, inorganics, VOC, BTEX, PAH, PCB and/or PHC.

A summary of the number of soil samples analyzed and the number of soil samples exceeding the Table 7 site condition standards for commercial properties with coarse soils and non-potable groundwater is provided below.

Parameter	Number of soil samples analyzed	Number of soil samples exceeding the MECP Table 7 Standards
Electrical Conductivity	14	1
Sodium Adsorption Ratio	15	0
Cyanide	1	0
Metals and Metal Hydride	14	1
BTEX and PHC F1-F4	15	0
PAH	16	3
VOC	4	0

The soil samples that exceeded the Table 7 site condition standards for commercial properties with coarse soils and non-potable groundwater are summarized below.

Location	Sample	Date	Parameter Group	Parameter	MECP Table 7 Standards[1] (µg/g)	Concentration (µg/g)
BH21-01	21-01 SA2	06/11/2021	Other regulated Parameters	Electrical conductivity	1400 µS/cm	2,660 µS/cm
			PAH	Benzo[a]pyrene	0.3	0.46
				Dibenzo[a,h]anthracene	0.1	0.29
BH21-02	BH21-02 SA2	2021-05-18	PAH	Anthracene	0.67	0.84
				Benzo[a]anthracene	0.96	2.61
				Benzo[a]pyrene	0.3	1.86
				Benzo[b]fluoranthene	0.96	2.39
				Benzo[k]fluoranthene	0.96	0.98
				Dibenzo[a,h]anthracene	0.1	0.26
BH21-04	BH21-04 SA3	2021-05-13	Metals	Vanadium	86	104
BH21-07	BH21-07 SA2	2021-05-17	PAH	Benzo[a]pyrene	0.3	0.38

Electrical conductivity and PAH impacts identified at BH21-01, PAH impacts identified for BH21-02 and vanadium impacts for BH21-04 are expected extend to bedrock, at 1.91, 1.27, and 3.81 mbgs, respectively. The elevated electrical conductivity is inferred to be related to application of road salt within the parking lot and is not considered to be an exceedance of the Table 7 standard. A deeper soil sample (BH21-07 SA3) collected from 1.52 to 1.65 mbgs at BH21-07 did not exceed the standards and are considered to be vertically delineated.

Historical soil samples reported by others in 2003, 2004, 2005 and 2017 were also assessed for regulatory guideline exceedances (Appendix D). A summary of the number of historical soil samples analyzed and the number of historical soil samples exceeding the Table 7 site condition standards for commercial properties with coarse soils is provided below. Only samples that were analyzed using current laboratory methods were considered while reviewing historical results (e.g., only PHC, F1-F4 and VOC data collected in 2011 and later).

Parameter	Number of historical soil samples assessed	Number of historical soil samples exceeding the MECP Table 7 Standards
Cyanide, Electrical Conductivity, Fluoride, Sodium Adsorption Ratio, and/or pH	2	0
Metals and/or Metal Hydride	11	0
PHC F1-F4	3	0
BTEX	3	0
PAH	15	4
VOC	3	0
Phenol	2	0
Pesticide	1	0
PCB	2	0
Dioxin and Furan	1	0

Historic soil sample exceedances of Table 7 site condition standards for commercial properties with coarse soils and non-potable groundwater are summarized below.

Location	Sample	Date	Parameter Group	Parameter	MECP Table 7 Standards[1] (µg/g)	Concentration (µg/g)
BH5	BH5-2-3	2003-10-28	PAH	Anthracene	0.67	0.68
				Benzo[a]anthracene	0.96	1.8
				Benzo[a]pyrene	0.3	1.4
				Benzo[b]fluoranthene	0.96	2
				Dibenzo[a,h]anthracene	0.1	0.28

Location	Sample	Date	Parameter Group	Parameter	MECP Table 7 Standards[1] (µg/g)	Concentration (µg/g)
04-BH6[a]	04-BH6-2	2004-08-31	PAH	Acenaphthylene	0.15	0.5
				Anthracene	0.67	1.5
				Benzo[a]anthracene	0.96	3.4
				Benzo[a]pyrene	0.3	2.7
				Benzo[b]fluoranthene	0.96	3.5
				Benzo[k]fluoranthene	0.96	1.4
				Dibenzo[a,h]anthracene	0.1	0.48
				Indeno[1,2,3-cd]pyrene	0.76	1.4
SS-1[a]	SS-1	2005-05-31	PAHs	Anthracene	0.67	2.4
				Benzo[a]anthracene	0.96	5.6
				Benzo[a]pyrene	0.3	4.2
				Benzo[b]fluoranthene	0.96	6.6
				Dibenzo[a,h]anthracene	0.1	0.4
				Fluoranthene	9.6	14
				Indeno[1,2,3-cd]pyrene	0.76	2
SS-4	SS-4	2005-05-31	PAHs	Benzo[a]pyrene	0.3	0.78
				Dibenzo[a,h]anthracene	0.1	0.16

[a]04-BH6 is located off-Site. SS-1 which exceeds for PAH parameters is located partially off-site (composite of three surface soil samples, one of which was on Site). Fill material at these locations, although off-Site are likely to be representative of the fill material on Site as they attributed to the same PCA.

6.7 Groundwater: Quality

Monitoring well construction details are summarized in Appended Table 1 and a list of groundwater samples submitted for laboratory analysis is provided in Appended Table 5. The analytical results for groundwater samples are summarized in Appended Tables 7a through 7e, along with the applicable Table 7 site condition standards. Laboratory certificates of analysis for groundwater are provided in Appendix C.

Golder completed sampling of monitoring wells at the Site on 27 May 2021. A summary of the number of groundwater samples analyzed and number of samples exceeding the Table 7 site condition standards is provided below:

Parameter	Number of groundwater samples analyzed	Number of groundwater samples exceeding the 2011 MECP Table 7 Standards
Chloride and Sodium	6	1
Metals and Metal Hydrides	6	0
BTEX and PHC F1-F4	6	0
PAH	6	0
VOC	6	2

Groundwater sample exceedances of Table 7 site condition standards for commercial properties with coarse soils and non-potable groundwater are summarized below.

Location	Sample	Date	Parameter Group	Parameter	MECP Table 7 Standards[1] (µg/L)	Concentration (µg/L)
BH21-02	BH21-02	2021-05-27	Other Regulated Parameters	Chloride	1,800,000	3,390,000
				Sodium	1,800,000	2,180,000
BH21-05	BH21-05	2021-05-27	VOC	Chloroform	2.0	2.09
BH21-06	BH21-06	2021-05-27	VOC	Chloroform	2.0	2.09

The sodium and chloride impacts identified for the groundwater sample collected at BH21-02 are expected to be related to used of road salt for safety purposes in the parking lot. The chloroform exceedances identified for BH21-05 and BH21-06 are considered to be related to the use of potable water during rock coring for these boreholes. Residual chlorine in potable water can react with natural organic matter in the subsurface to form chloroform. These exceedances are expected to be localized and short lived. It is also noted where an exceedance is solely attributed to the application salt for safety purposes (i.e. sodium and chloride) it is not considered exceeding the standard. As such, 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.

Historical groundwater samples reported by others in 2016 and 2017 were also assessed for regulatory guideline exceedances (Appendix D). Further historic groundwater samples were reported in 2004 and 2005; these sample were not evaluated as they were considered to be too old to be representative of current Site conditions. A summary of the number of historical groundwater samples analyzed and the number of historical groundwater samples exceeding the Table 7 site condition standards for commercial properties with coarse soils is provided below.

Parameter	Number of historical groundwater samples assessed	Number of historical groundwater samples exceeding the MECP Table 7 Standards
Other Regulated Parameters	6	1
Metals and/or Metal Hydride	7	0
PHC F1-F4	5	0
BTEX	6	0
PAH	9	0
VOC	6	0[2]
Phenols	4	0
Pesticide	1	0
PCB	4	0
Dioxin and Furan	3	0

Historic groundwater exceedances of Table 7 site condition standards for commercial properties with coarse soils and non-potable groundwater are summarized below.

Location	Sample	Date	Parameter Group	Parameter	MECP Table 7 Standards[1] (µg/g)	Concentration (µg/L)
MW4	MW4	2017-08-03	Other Regulated Parameters	Chloride	1,800,000	3,000,000

The historic chloride impact identified for the groundwater sample collected at MW4 is inferred to be related to road salt use within the parking area. As previously stated, this is not considered to be an exceedance as it is associated with the application of salt for safety purposes.

According to the “Guidance for Addressing Chloroform at a Record of Site Condition Property” the applicable site condition standards for chloroform need not to be considered to be exceeded if the Site meet the below two criteria:

- The source of chloroform is only associated with water from a treated municipal water supply; and
- A soil and groundwater concentrations are numerically equal to or lower than the values listed in Table A of the guideline.

[2] Detection limits for 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene, 1,2-Dibromoethane, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Bromomethane, Carbon Tetrachloride, and/or Vinyl Chloride were above regulatory guidelines for four samples.

Based on the Phase One ESA investigation completed for the Site by Golder in 2021, there was no known source of chloroform or other trihalomethanes on the Site or within the study area.

The concentration of chloroform in all soil samples collected during the Phase Two investigation were below the laboratory detection limits (<0.04 µg/g), which is below Table A guideline (2.3 µg/g). The concentration of chloroform in all groundwater samples collected from the Site were below Table A guideline (25 µg/L).

The Site meets the two criteria outlined above. It is therefore the opinion of the Qualified Person, that the chloroform exceedances in groundwater samples were likely associated with the use of potable water during bedrock coring. As such, groundwater at the Phase Two Property meets the applicable site condition standards.

6.8 Sediment: Quality

No sediment samples were collected as part of this investigation.

6.9 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 are presented in appended Tables 5f and 6f, respectively. RPD results for most analyzed parameters were under the maximum 10% to 50% acceptance criteria, depending on medium and parameter, specified in the Analytical Protocol. Analytical parameters which did not meet the acceptance criteria specified within the Analytical Protocol are listed in the table below.

Medium	Sample	Parameter	Unit	Concentration	Calculated RPD (%)	Acceptance Criteria (%)
Soil	BH21-03 SA2	Barium	µg/g	339	48.35	30
	BH21-03 SA22 (dup)			207		
	BH21-03 SA2	Lead	µg/g	75	56.41	30
	BH21-03 SA22 (dup)			42		
Groundwater	BH21-03	Chloride	µg/L	103,000	50.72	20
	DUP-3			173,000		

The RPD limits indicated above and in Appended Tables 5f and 6f are used to evaluate laboratory duplicates. The elevated soil duplicate concentration is attributed to inherent sample heterogeneity in soil samples. The results indicate that there is some variability in the soil quality within samples and that lead and barium concentrations may vary up to ±50% of the reported values. Further, chloride concentrations in groundwater may exceed the measured concentration, however any elevated concentrations are considered to be related to use of road salt for safety purposes and therefore do not represent and exceedance of the Table 7 standard at the Site.

A trip blank sample was submitted with groundwater samples collected on May 27, 2021 and analyzed for BTEX. No detectable concentrations were found in the trip blank sample. 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 C.

A laboratory QAQC violation was identified for selenium in soil sample BH21-13 SA1 due to reference material measurement being outside of the acceptable range. The laboratory provided the following comment addressing this QAQC violation "For a multi-element scan for laboratory control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10%."

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

6.10 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 PCAs were identified within the Phase One Study Area. The location of each PCA is provided in Figure 2.

PCA Location ID	Location	PCA	Information Source	Rationale for Potential Contribution of the PCA to an APEC
n/a	Across the Site	***30. Importation of Fill Material of Unknown Quality.*** Imported fill materials associated with various building construction and site development activities across the Site.	Site Observations, Previous Reports	The PCA is located on-Site and as such is considered an APEC.
A	Parcel A of the Site	***30. Importation of Fill Material of Unknown Quality.*** Former Dow's Lake landfill on Parcel A with documented impacts to soil and groundwater. No municipal solid waste identified.	Previous Reports	The PCA is located on-Site with known impact to soil and groundwater. As such, this is considered an APEC.

PCA Location ID	Location	PCA	Information Source	Rationale for Potential Contribution of the PCA to an APEC
B	Parcel B of the Site	Demolition debris from office building on Parcel B with documented PAHs (federal guidelines) and metals (federal guidelines and provincial standards) impacts within fill layer.	Site Observations, Previous Reports, Aerial Photographs	Given the potential presence of demolition debris across majority of Parcel B, this on-Site PCA is considered an APEC.
C	Off-Site. Approximately 130 m south of the Site	Building demolition debris in fill layer associated with former SJCB building footprint with documented exceedance of PAHs, metals and/or phenols in soil (fill) and groundwater (compared to federal guidelines with limited exceedances of provincial standards at one location).	Site Observations, Previous Reports, Aerial Photographs	Given inferred distance of this PCA from the Site, it is not considered as an APEC for the Site.
D	Off-Site. Approximately 130 to 230 m southeast of the Site	***55. Electricity Generator, Transformation and Power Station (Hydro Ottawa Sub-Station).*** Three concrete pad mounted transformers in the vicinity of the SJCB West Annex building.	Site Observations	Given inferred distance of this PCA from the Site, it is not considered as an APEC for the Site.
E	Off-Site. Approximately 200 m southeast of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Former hydraulic oil elevator located in West Annex of SJCB.	Site Observations, Previous Reports	Given inferred distance of this PCA from the Site, it is not considered as an APEC for the Site.
F1 and F2	Off-Site. Approximately 125 m to 200 m south of the Site	Reported glycol leak from parking ramp system of SJCB East Annex	Site Observations, Previous Reports	Given inferred distance of this PCA from the Site, it is not considered as an APEC for the Site.
G1, G2 and G3	Off-Site. Approximately 130 m south of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Three former diesel ASTs reportedly associated with SJCB.	Site Observations, Previous Reports	Given inferred distance of this PCA from the Site, it is not considered as an APEC for the Site.
H	Off-Site. Approximately 120 m northeast of the Site	***37. Operation of Dry-Cleaning Equipment (where chemicals are used).*** Peloso Cleaners at 489 Preston Street	Site Observations, ERIS Report[3]	Given inferred down-gradient location of this PCA compared to the Site and separation by roadways with associated underground utilities, it is not considered as an APEC for the Site.
I	Off-Site. Approximately 70 m northwest of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Gasoline and Diesel USTs at 350 Loretta Avenue	Site Observations, ERIS Report, HLUI	Given inferred cross-gradient location of this PCA compared to the Site and separation by roadways with associated underground utilities, it is not considered as an APEC for the Site.

[3] The following abbreviations are used in the table above: Environmental Risk Information Services (ERIS), Historic Land Use Inventory (HLUI), and Fire Insurance Plans (FIPs).

PCA Location ID	Location	PCA	Information Source	Rationale for Potential Contribution of the PCA to an APEC
J	Off-Site. Approximately 50 m north of the Site	***10. Commercial Autobody Shops.*** Auto Service garage with four USTs at 829 Carling Avenue	Site Observations, HLUI	Given inferred down-gradient location of this PCA compared to the Site, separation by a roadway with underground utilities between this PCA and Site, as well as absence of any reported spills associated the USTs, this PCA is not considered an APEC for the Site.
K	Off-Site. Approximately 140 m northeast of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Retail fuel outlet at 485 Preston Street	Site Observations, ERIS Report, HLUI	Given inferred cross-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
L	Off-Site. Approximately 100 m northeast of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Four USTs at 1001 Queen Elizabeth Drive	Site Observations, ERIS Report	Given inferred cross-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
M	Off-Site. Approximately 90 m north of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Retail fuel outlet with USTs at 505 Preston Street	Site Observations, ERIS Report, HLUI	Given inferred down-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
N	Off-Site. Approximately 100 m northwest of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Retail fuel outlet with USTs at 111 Sherwood Drive	Site Observations, HLUI	Given inferred down- to cross-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
O	Off-Site. Approximately 40 m north of parcel A	***33. Metal Treatment, Coating, Plating and Finishing.*** Campbell Steel and Iron Works Ltd at 855 Carling Avenue	FIPs	Given inferred down-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.

PCA Location ID	Location	PCA	Information Source	Rationale for Potential Contribution of the PCA to an APEC
P	Off-Site. Approximately 200 m northeast of the Site	***37. Operation of Dry Cleaning Equipment (where chemicals are used.*** Hunter Cleaners at 787 Carling Avenue	FIPs	Given inferred down- to cross-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
Q	Off-Site. Approximately 50 m northwest of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Retail fuel outlet with USTs at 531 Preston Street	FIPs	Given inferred down-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
R	Off-Site. Approximately 100 m north of the Site	***28. Gasoline and Associated Products Storage in Fixed Tanks.*** Fuel oil Depot with eight USTs at 140 Hickory Street	FIPs	Given inferred down-gradient location of this PCA compared to the Site, distance as well as separation by roadways with associated underground utilities between this PCA and Site, it is not considered as an APEC for the Site.
S	Off-Site. Between Parcel A and B	***46. Rail Yards, Tracks and Spurs.*** Railway tracks, located between Parcel A and B, currently used by O-Train.	Site Observations, Aerial Photographs	Given this off-Site PCA is located at a lower elevation compared to the Site, any fill related issues likely have been removed at the time of installation of these railway tracks.
n/a	Off-Site. Entire parcel adjacent to the southern boundary of the Site	***40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.*** Pesticide application associated with former farming activities on the parcel adjacent to southern boundary of the Site.	Aerial Photographs	Given inferred distance of this PCA from the Site, it is not considered as an APEC for the Site.

Areas of Potential Environmental Concern

A summary of the APECs identified at the Phase One Property is provided in the Table below. The location of each APEC is presented in Figure 2.

APEC	Description	COCs
APEC 1: Former Dow's Lake Landfill	Former Dow's Lake Landfill at Parcel A. No municipal solid waste noted at the Site during previous investigations (landfilled material limited to soil and demolition debris). Fill of unknown quality.	PHCs[4], BTEX, VOCs, PAHs, Metals, and Inorganics
APEC 2: Demolition debris from former office building	Demolition debris from the demolition of a former office building on Parcel B with documented PAH (federal guidelines) and metals (federal guidelines and provincial standards) impacts within the fill layer.	PHCs, BTEX, PAHs, Metals, and Inorganics
APEC 3: Imported fill materials of unknown quality	Unknown quality of imported fill materials associated with various building construction and site development activities across the Site.	PHCs, BTEX, PAHs, Metals, and Inorganics

PHYSICAL SETTING

Stratigraphy

A representative geologic cross-section of the Site, oriented parallel to the interpreted groundwater flow direction, is presented in Figure 7. In general, the subsurface soil conditions encountered in the boreholes and test pits consisted of surficial topsoil and fill with the following characteristics:

- Topsoil was generally encountered between ground surface and a maximum depth of 0.3 mbgs which consisted of brown to dark brown silty sand, sandy silt, or gravelly silty sand with organics. At BH21-01, concrete was encountered at ground surface to a maximum depth of 0.05 mbgs;
- Fill was encountered between 0.10 to depths ranging between 0.8 to 3.8 mbgs which consisted of brown, dark brown, or grey-brown silty sand, sandy silt, or gravelly silty sand; silty clay was encountered in BH21-13; black molting, cobble, brick, concrete, and other waste was observed in several boreholes;
- Glacial till was encountered between 1.5 and 1.7 mbgs at BH21-03 and 0.8 and 3.0 mbgs in BH21-13 which consisted of grey or grey-brown gravelly silty sand; native soils were not observed in any other boreholes;
- At BH21-05, concrete was encountered between 1.25 and 1.79 m bgs underlain by fill between 1.79 to 1.95 m bgs; and
- Bedrock was encountered at depths between 1.2 and 3.8 mbgs.

Given that the average thickness of overburden at the Site is less than 2 m, the Site is considered to be a shallow soil property as defined by O.Reg. 153/04 (as amended).

Depth to Bedrock

Limestone bedrock was either encountered or inferred (refusal at BH21-01, BH21-04, 21-08 and BH21-11) in all boreholes starting between 1.2 and 3.8 mbgs during the Phase Two investigation.

[4] The following abbreviations are used in the table above: petroleum hydrocarbon fractions F1-F4 (PHCs), benzene, toluene, ethylbenzene, and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs).

Hydrogeological Characteristics

Regional groundwater flow follows the topography of the Site, primarily southwest to on Parcel A and northeast on Parcel B towards the rock cut for the O-train. Regional groundwater is expected to flow north to the Ottawa River located approximately 2.8 km north of the Site.

Groundwater levels were measured in the monitoring wells located across the Site on May 27, 2021. Figure 4 shows groundwater elevations and the interpreted groundwater flow direction. Groundwater elevations ranged from 62.30 to 64.03 masl on May 27, 2021.

At the time of groundwater sample collection (May 27, 2021), the saturated screen length at the sampled locations ranged from 1.66 m (BH21-03) to 3.30 m (BH21-05).

The average horizontal hydraulic gradient was estimated for shallow groundwater conditions based on water levels collected on May 27, 2021, and the inferred groundwater contours presented on Figure 4. The horizontal hydraulic gradient for shallow groundwater conditions was 0.033 m/m along the majority of the site, with a less steep gradient of 0.022 m/m along the southern Site boundary.

Vertical hydraulic gradients were not calculated as no nested monitoring well pairs were installed on the parkade property.

Depth to Groundwater

Groundwater elevations ranged from 2.03 to 3.65 metres below top of pipe (mbtop) on May 27, 2021.

SITE CONDITION STANDARDS

Environmentally Sensitive Areas

There are no areas of natural significance located on or within 30 meters of the Phase Two Property. Three surface soil samples (up to 1.5 mbgs) and one subsurface soil sample (greater than 1.5 mbgs) were submitted for pH analysis as part of prior investigations (Stantec, 2017). The reported pH of three of the four samples met the requirements that the pH of surface soil is 5≤pH≤9 and the pH of sub-surface soil is 5≤pH≤11; with pH values ranging from 7.51 (MW17-03 SS01) to 7.66 (MW17-02 SS01). Surface soil sample MW17-01 SS01 exceeded the pH requirements with a value of 11.3. The elevated pH was inferred to be related to concrete material in the fill. Golder understands that this material will be removed during construction and does not constitute an environmentally sensitive site. In accordance with this prior report, and planned redevelopment at the Site, Golder deems Section 41 of the Regulation to not apply to the Phase Two Property.

Shallow Soil Property or Water Body

Bedrock was encountered at a minimum depth of 1.2 metres below ground surface. 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. Accordingly, Section 43.1 of the Regulation does t apply to the Phase Two Property (shallow soil property).

Imported Soil

Fill of unknown quality has been imported onto the Phase Two Property during various building construction and site development activities across the Site. Fill was identified throughout the Phase Two Property to a maximum depth of 3.8 mbgs. This PCA was investigated as part of APEC 3; no contaminant impacts were identified.

Proposed Buildings and Other Structures

There are currently no structures located on-Site. The Site is proposed to be developed with commercial land use as a parkade structure for the new Civic development for the Ottawa Hospital.

DELINEATION OF CONTAMINANT IMPACTS

APEC 1

PAH impacts have been identified for the current soil sample collected at BH21-02 and historical soil sample BH5 these samples are delineated by bedrock encountered at 1.27 and 1.52 mbgs, respectively. At one location within APEC 1, elevated electrical conductivity was noted. Elevated conductivity at this location was attributed to application of road salt for safety purposes and was therefore not considered to be and exceedance of the Table 7 Standards.

The sodium and chloride impacts identified for the current groundwater sample collected at BH21-02 and historic groundwater sample collected at MW4 are expected to be related to road salt use within the parking area, and it is the opinion of the Qualified Person that groundwater for APEC 1 at the Phase Two Property meets the applicable site condition standards.

APEC 2

Vanadium impacts identified for BH21-04 are delineated by the presence of bedrock at 3.81 mbgs. The PAH (benzo[a]pyrene) impacts identified for BH21-07 are considered to constrained to the upper soil layers (above 1.37 mbgs) and are vertically delineated by a deeper soil sample that had concentrations measured below the applicable site condition standards. Vanadium is commonly associated with marine clay from eastern Ontario. Given the concentration of vanadium is within the range commonly present in local soils and the fill was documented to contain silty clay it is the QPs determination that the vanadium is of natural origin and therefore meets the standard.

Elevated concentrations of chloroform were identified in groundwater samples collected from BH21-05 and BH21-06 (2.08 µg/L compared to the Table 7 standard of 2 µg/L). These concentrations are inferred to be due to the use of potable water during rock coring (chloroform can be produced as a byproduct). It is the opinion of the Qualified Person that groundwater for APEC 2 at the Phase Two Property meets the applicable site condition standards.

APEC 3

No contaminant impacts were identified specifically for APEC 3; however impacts identified in APEC 1 and 2 could also be attributed to APEC 3, as all are fill related impacts.

Contaminant Distribution

PAH and vanadium identified for soils appear to be present across the middle and northern portions of the Site. The horizontal extents of impact are shown on Figure 5.

Sodium and chloride impacts to groundwater appear to be limited to the western portion of Parcel A, whereas chloroform impacts appear to be limited to the southern and eastern portions of Parcel B.

Potential Reason for Discharge into the Environment at the Site

PAH impacts identified to soils identified across Parcels A and B the Site appear to be the result of former site use as a landfill (Parcel A) and demolition debris or poor quality fill material (Parcel B – ash was noted to be in the fill sample at this location).

Vanadium impacts identified for BH21-04 are delineated by the presence of bedrock at 3.81 mbgs. The PAH (benzo[a]pyrene) impacts identified for BH21-07 are considered to constrained to the upper soil layers (above 1.37 mbgs) and are vertically delineated by a deeper soil sample that had concentrations measured below the applicable site condition standards. Vanadium is commonly associated with marine clay from eastern Ontario. Given the concentration of vanadium is within the range commonly present in local soils and the fill was documented to contain silty clay it is the QPs determination that the vanadium is of natural origin and therefore meets the standard.

The elevated concentration of sodium and chloride in groundwater identified within Parcel A of the Site are expected to be related to road salt use within the parking area and are not considered to represent an exceedance of the Table 7 standards.

The elevated chloroform concentrations identified within Parcel B of the Site are expected be due to the use of potable water during rock coring for these boreholes and are not considered to represent an exceedance of the Table 7 standards. Additionally they are expected to be localized and short lived.

Utilities, specifically storm sewers run through the parking area of Parcel A. The depth of the storm sewers is unknown and may influence groundwater flow at a local level. The rock cut for the O-train is expected to dewater groundwater between Parcel A and Parcel B and would intersect groundwater from both parcels. As no groundwater contamination has been identified at the Site, subsurface structures and utilities would not represent a preferred pathway for contaminant migration.

Subsurface Structures and Utilities

Contaminant Migration

Impacts identified in current and historic soil samples are not considered to present a contaminant mass contributing to groundwater contamination, as the water table is located below the upper bedrock horizon. This is supported by no COCs identified in soil samples being present above regulatory guidelines in groundwater samples. It is anticipated that the identified soil impacts which are limited to fill will be removed during soil excavation activities related to the development of the parkade structure.

No exceedances of the site condition standards for groundwater were identified at the site and thus, contaminant migration in groundwater is not expected to be an issue of concern for the Site.

The presence of the O-Train subsurface structure at the Site is expected to act as a preferential pathway to groundwater flow as the structure intersects the water table. However, no groundwater contamination has been identified at 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

Soil vapour intrusion is not anticipated because the impacts are expected to be related to the use of tap water during rock coring for these boreholes and are not anticipated to be present elsewhere on Site.

Lateral and Vertical Distribution of Contaminants

The lateral extent of soil impacts is identified in Figure 5. Exceedances are known to exist north of the Site boundary, extending to Carling Avenue. The fill material noted on Site is heterogeneous and areas of poor fill quality may exist outside of the area identified on Figure 5. The depth of soil impacts is generally delineated by the presence of shallow bedrock, however, at one location (BH21-7), PAH impacts were vertically delineated with a deeper fill soil sample which did not contain ash.

POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS

It is anticipated that the identified soil impacts which are limited to fill will be removed during soil excavation activities related to the development of the parkade structure; therefore, potential release and transport mechanisms, exposure pathways and human and ecological receptors are not considered further. The Occupational Health and Safety Plan developed for construction of the Parkade structure should consider the presence of elevated concentrations and include risk mitigation measures for construction workers.

7.0 CONCLUSIONS

The Phase Two ESA investigated the three APECs identified in the 2020 Phase One ESA.

The analytical results from the sampling and analysis program indicate that the reported concentrations of PAHs in three soil samples, electrical conductivity in one sample, and vanadium in one soil sample, sodium and chloride in one groundwater sample, and chloroform in two groundwater samples did not meet the applicable MECP Table 7 site condition standards. Historical exceedances of PAHs were identified at one other borehole location within the Site, two composite surface soil samples (one of which extended off-site to the north) and an off-site borehole to the north. Elevated concentrations of electrical conductivity in soil and sodium and chloride in groundwater is attributed to application of road salt for safety purposes. Elevated concentrations of vanadium in soil are attributed to known naturally elevated concentrations in eastern Ontario marine clays. Elevated concentrations of chloroform are attributed to used of potable water during bedrock coring. It is the opinion of the Qualified Person that these results (vanadium and electrical conductivity in soil and sodium, chloride and chloroform in groundwater) do not represent exceedances of the site condition standards. The reported concentrations of all other parameters tested in soil and groundwater were below the Table 7 generic site condition standards for commercial property use with coarse soil texture and non-potable groundwater.

PAH soils impacts identified across the Site appear to be the result of former site use as a landfill and demolition debris from the previous presence of buildings on Site, however could also be related to poor quality fill material brought to the Site. The elevated concentrations of sodium and chloride identified in groundwater at the Site are expected to be related to road salt use within the parking area. The elevated concentrations of identified in groundwater Site are expected be due to the use of potable water during rock coring for these boreholes.

Impacts identified in current and historic soil samples are not considered to present a contaminant mass contributing to groundwater contamination. This conclusion is supported by no COCs identified in soil samples being present above regulatory guidelines in groundwater samples. It is anticipated that the identified soil impacts will be removed during soil excavation activities related to the development of the parkade structure.

Elevated concentrations of contaminants of concern in the groundwater at the Site (chloride, sodium, and chloroform) are inferred to not be related to the identified APECs. Thus, contaminant migration in groundwater is not expected to be an issue of concern for the Site.

Based on the results of the soil and groundwater samples submitted as part of this Phase Two ESA, remediation of PAH impacts in the fill material is recommended prior to redevelopment into a commercial parkade.

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

7.1 Additional Considerations

It is noted that by meeting the site condition standards it does not imply the soil is suitable for off-Site beneficial reuse as clean fill, just that it is suitable for the intended use on-Site. Characterization of the soil to Regulation 406/19 will be required prior to removing any soil from the site in order to determine the potential beneficial uses off-Site. Soil with no beneficial use off-Site would require landfill disposal, if not retained on the Site.

Golder has assumed that the impacted fill will be removed at the time of construction as fill is generally not a suitable founding layer for structures. If any of the fill is to remain on the Site, an evaluation of risk related to the PAH concentrations should be undertaken.

8.0 REFERENCES

Canadian Council of Ministers of the Environment (2016). *Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment*. Volume 1 Guidance Manual

Environmental Investigation of Subsurface Conditions, Proposed New Hospital Campus, Former Sir John Carling Building Complex, Central Experimental Farm, Ottawa ON, dated September 2017, prepared by Paterson Group Inc. for Cleland Jardine Engineering Ltd.

Government of Ontario. (2011). *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*. Laboratory Services Branch Ministry of the Environment. March 9, 2004, amended as of July 1, 2011.

Screening Level Risk Assessment, Former Dow's Lake Landfill and Commissioner's Park, NCC Property Assets #96654 and #784 Ottawa, Ontario, dated October 2005, prepared by INTERA Engineering Ltd. for NCC.

Supplemental Phase II Environmental Site Assessment, Former Dow's Lake Landfill, National Capital Commission Property Assets #784 Ottawa, Ontario, dated November 2004, prepared by INTERA Engineering Ltd. for NCC.

Phase II Environmental Site Assessment, Former Sir John Carling Building, 930 Carling Avenue, Ottawa ON (DFRP# 08625), dated March 2016, prepared by Stantec Consulting Ltd. for PSPC.

Phase II Environmental Site Assessment, New Ottawa Hospital Civic Campus, Ottawa ON, dated September 2017, prepared by Stantec Consulting Ltd. for PSPC.

Phase One Environmental Site Assessment, The Ottawa Hospital – New Civic Campus, dated April 2020, prepared by Golder Associates Ltd for Patterson Inc.

9.0 LIMITATIONS

This report was prepared for the exclusive use of Parsons Inc. and the Ottawa Hospital for the purpose of obtaining planning approvals and to support the future construction of the Parkade. The report, which specifically includes all tables, figures and appendices, is based on data and information, collected during conducting the Phase Two ESA, and is based solely on the conditions of the property at the time of conducting investigations, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

The assessment of environmental conditions at this Site has been made using the results of field screening techniques and chemical analysis of soil and groundwater samples at a limited number of locations. The Site conditions between sampling locations have been inferred based on conditions observed at the sampling locations. Conditions may vary from these sample locations. Additional study, including further investigation, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a Site may be contaminated and remain undetected.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party (other than as noted above) as a result of decisions made or actions based on this report.

The content of this report is based on information collected during the drilling, soil and groundwater sampling activities, our present understanding of the Site conditions, and our professional judgement in light of such information at the time of this report. This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

The monitoring wells installed as part of this project have been constructed using licensed drilling/well contractors employing licensed well technicians. It is owner’s responsibility to have a licensed well technician properly abandon all monitoring wells, if required.

10.0 SIGNATURES

The undersigned Qualified Person confirms that he/she was responsible for conducting and/or supervising this Phase Two ESA and the associated findings and conclusions.

We trust that you will find the contents of this report satisfactory for your current needs. Should you require clarification of the information provided, please do not hesitate to contact the undersigned.

Golder Associates Ltd.

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Tables

Table 1
Monitoring Well Construction Details
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Monitoring Well	Date Installed	Installed by	Ground Surface Elevation (masl)	Top of Pipe Elevation (masl)	Well Diameter (mm)	Screen Length (m)	Screen Interval (mbgs)	Borehole Depth (mbgs)	Lithology at Screen
BH21-01	11-Jun-21	Downing	65.054	64.893	52	0.92	0.81 - 1.73	1.91	FILL, WASTE, GRAVEL
BH21-02	18-May-21	Downing	65.671	66.786	32	3.05	1.98 - 5.03	7.29	SHALEY NODULAR LIMESTONE
BH21-03	18-May-21	Downing	64.972	65.949	32	3.05	2.26 - 5.31	5.31	SHALEY NODULAR LIMESTONE
BH21-05	14-May-21	Downing	65.577	66.545	38	3.05	3.89 - 6.94	6.94	SHALEY NODULAR LIMESTONE
BH21-06	12-May-21	Downing	67.002	67.936	38	2.74	2.66 - 5.40	5.40	SHALEY NODULAR LIMESTONE
BH21-10	18-May-21	Downing	66.190	67.126	38	2.69	2.74 - 5.49	5.49	SHALEY LIMESTONE
MW17-2/ MW17-02	28-Jul-17	Strata	66.103	66.064	52	3.05	3.05-6.10	6.10	Bedrock

Notes

masl	metres above sea level
mbtop	metres below top of pipe
NA	not available
-	not applicable

Table to be read in conjunction with accompanying report.

Table 2
Groundwater Monitoring
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Monitoring Well	Ground Surface Elevation (masl)	Top of Pipe Elevation (masl)	27-May-21							
			Depth to water (mbtop)	Groundwater Elevation (masl)	Conductivity (mS/cm)	Temperature (°C)	DO (mg/L)	ORP (mV)	pH	Turbidity (NTU)
BH21-01[a]	65.054	64.893	-	-	-	-	-	-	-	-
BH21-02	65.671	66.786	3.150	63.64	9.71	17.63	0.00	156	6.94	88.8
BH21-03	64.972	65.949	3.63	62.32	1.46	15.07	5.72	164	7.42	197
BH21-05	65.577	66.545	3.705	62.84	1.19	14.07	3.00	184	7.42	802
BH21-06	67.002	67.936	3.62	64.32	1.86	15.09	4.20	81	6.86	425
BH21-10	66.190	67.126	3.44	63.69	1.39	15.42	2.05	179	7.09	232
MW17-2/ MW17-02	66.103	66.064	2.04	64.02	1.42	16.61	0.00	154	7.07	46.2

Notes:

masl	metres above sea level
mbtop	metres below top of pipe
mS/cm	milliSeimans per centimere
°C	degrees Celsius
mg/L	milligram per litre
mV	millivolts
NTU	Nephelometric Turbidity unit
a	Monitoring well location was dry.
-	not applicable

Table to be read in conjunction with accompanying report.

Table 3
Groundwater Elevations
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Monitoring Well ID	Ground Surface Elevation (masl)	Top of Pipe Elevation (masl)	09-Jun-21		28-May-21		27-May-21	
			Depth to water (mbtop)	Groundwater Elevation (masl)	Depth to water (mbtop)	Groundwater Elevation (masl)	Depth to water (mbtop)	Groundwater Elevation (masl)
BH21-01[a]	65.054	64.893	-	-	-	-	-	-
BH21-02	65.671	66.786	-	-	3.20	63.59	3.105	63.68
BH21-03	64.972	65.949		-	3.57	62.38	3.650	62.30
BH21-05	65.577	66.545	3.83	62.71	3.69	62.85	3.700	62.84
BH21-06	67.002	67.936	-	-	-	-	2.12	65.82
BH21-10	66.190	67.126	3.59	63.54	3.60	63.53	3.64	63.49
MW17-2	66.103	66.064	2.05	64.01	2.03	64.03	2.03	64.03

Notes:

masl	metres above sea level
mbtop	metres below top of pipe
NA	not available
-	not applicable
a	Monitoring well location was dry.

Table to be read in conjunction with accompanying report.

Table 4
Summary of Soil Samples Submitted for Laboratory Analysis
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Borehole	Sample ID	Sampling Date	Sample Depth (mbgs)	Soil Type	ANALYSES PERFORMED								
					Metals and Hydrides[1]	ORPs (B-HWS, Cr^{6+}, Hg)[2]	PAH	PHC F1-4	VOC	BTEX	Electrical Conductivity	SAR	Cyanide
BH21-01	BH21-01 SA2	11-Jun-21	0.91 - 1.52	silty sand FILL	X	X	X	X		X	X	X	X
BH21-02	BH21-02 SA2	18-May-21	0.76 - 1.17	silty sand FILL	X	X	X	X	X	X	X	X	
BH21-03	BH21-03 SA2	18-May-21	0.61 - 1.37	silty sand FILL	X	X	X	X	X	X	X	X	
	BH21-03 SA22	18-May-21	0.61 - 1.37	silty sand FILL	X	X	X	X	X	X	X	X	
	BH21-03 SA3	18-May-21	1.52 - 1.68	silty sand			X	X	X	X			
BH21-04	BH21-04 SA3	13-May-21	1.52 - 2.13	silty clay FILL	X	X	X	X		X	X	X	
BH21-05	BH21-05 SA1	14-May-21	0.00 - 0.61	silty sand TOPSOIL and silty sand FILL	X	X	X	X		X	X	X	
BH21-06	BH21-06 SA2	14-May-21	0.76 - 1.37	silty sand to sandy silt FILL	X	X	X	X		X	X	X	
BH21-07	BH21-07 SA2	17-May-21	0.76 - 1.37	silty sand FILL	X	X	X	X		X	X	X	
	BH21-07 SA3	17-May-21	1.52 - 1.65	silty sand FILL			X						
BH21-08	BH21-08 SA1	18-May-21	0.00 - 0.61	silty sand TOPSOIL and silty sand FILL	X	X	X	X		X	X	X	
BH21-09	BH21-09 SA2	18-May-21	0.76 - 1.37	silty sand FILL	X	X	X	X		X	X	X	
BH21-10	BH21-10 SA1	18-May-21	0.00 - 0.61	silty sand TOPSOIL and silty sand FILL			X	X		X			
	BH21-10 SA2	18-May-21	0.76 - 1.37	silty sand FILL	X	X					X	X	
BH21-11	BH21-11 SA1	13-May-21	0.00 - 0.61	silty sand TOPSOIL and silty sand FILL	X	X	X	X		X	X	X	
BH21-12	BH21-12 SA1	19-May-21	0.00 - 0.61	silty sand TOPSOIL and silty sand FILL	X	X	X	X		X	X	X	
BH21-13	BH21-13 SA1	13-May-21	0.00 - 0.61	sandy silty TOPSOIL and silty clay FILL	X	X	X	X		X	X	X	
	BH21-13 SA3	13-May-21	1.52 - 2.13	silty sand	X	X	X	X	X	X	X	X	

Notes

mbgs	Metres below ground surface
1	Ontario Regulation 153 Metals. Hydrided-forming metals refers to Arsenic, Selenium, Antimony.
ORP	Other Regulated Parameters
B-HWS	Hot-water soluble boron
Cr^{6+}	Hexavlent chromium
Hg	Mercury
PAH	Polycyclic aromatic hydrocarbons
PHC F1-F4	Petroleum hydrocarbons fractions F1 to F4
VOC	Volatile organic compounds
BTEX	Benzene, toluene, ethylbenzene, xylene mixture
SAR	Sodium Absorption Ratio
X	Samples shaded in red exceed the applicable standards
X	Samples shaded in green met the applicable standards

Table to be read in conjuction with accompanying report

Table 5
Summary of Groundwater Samples Submitted for Laboratory Analysis
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Monitoring Well	Sample ID	Sampling Date	ANALYSES PERFORMED				
			Metals and Hydrides[1]	PHC	PAH	VOC	Chloride
BH21-02	BH21-02	27-May-21	X	X	X	X	X
BH21-03	BH21-03	27-May-21	X	X	X	X	X
	DUP-3	27-May-21	X	X	X	X	X
BH21-05	BH21-05	27-May-21	X	X	X	X	X
BH21-06	BH21-06	27-May-21	X	X	X	X	X
BH21-10	BH21-10	27-May-21	X	X	X	X	X
MW17-2	MW17-2	27-May-21	X	X	X	X	X
-	TRIP BLANK	27-May-21		X			

Notes

1 Ontario Regulation 153 Metals. Hydrided-forming metals refers to Arsenic, Selenium, Antimony.

PAH Polycyclic aromatic hydrocarbons

PHC F1-F4 Petroleum hydrocarbons fractions F1 to F4

VOC Volatile organic compounds

X Samples shaded in red exceed the applicable standards

X Samples shaded in green met the applicable standards

Table to be read in conjuction with accompanying report

Table 6a
Analytical Results for General Chemistry in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			BH21-01	BH21-02	BH21-03			BH21-04	BH21-05	BH21-06	BH21-07		BH21-08	BH21-09	BH21-10	BH21-10	BH21-11	BH21-12	BH21-13	
Sample Name			21-01 SA2	BH21-02 SA2	BH21-03 SA2	BH21-03 SA22 (dup)	BH21-03 SA3	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-07 SA3	BH21-08 SA1	BH21-09 SA2	BH21-10 SA1	BH21-10 SA2	BH21-11 SA1	BH21-12 SA1	BH21-13 SA1	BH21-13 SA3
Sample Date			06/11/2021	2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-17	2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-19	2021-05-18	2021-05-13
Sample Depth (mbgs)			0.91-1.52 m	0.76-1.17 m	0.61-1.37 m	0.61-1.37 m	1.52-1.68 m	1.52-2.13 m	0-0.61 m	0.76-1.37 m	0.76-1.37 m	1.52-1.65 m	0-0.61 m	0.76-1.37 m	0-0.61 m	0.76-1.37 m	0-0.61 m	0-0.61 m	0-0.61 m	1.52-2.13 m
Parameter	**MECP Table 7 Standards[1]**	**Unit**																		
Conductivity	1400	µS/cm	**2860**	320	398	373	-	242	289	347	201	-	197	446	-	351	203	185	166	261
Moisture, Percent	-	%	8.7	11.2	19.1	6.9	8.4	25.9	15.2	8.9	13.3	5.8	5.1	8.2	14.1	-	23.7	15.8	22.7	10.1
Sodium Adsorption Ratio	12	-	0.661	0.718	2.34	2.43	-	0.349	0.182	0.163	0.13	-	0.213	0.142	0.103	0.103	0.329	0.923	0.11	0.269
Cyanide, Free	0.051	µg/g	<0.040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1	O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
mbgs	metres below ground surface
µS/cm	microSiemens per centimetre
µg/g	microgram per gram
<	Indicates parameter was below laboratory equipment detection limit.
-	Chemical not analyzed or criteria not defined.
Bold and shaded	Exceeding MECP Table 7 Standards

Table to be read in conjunction with accompanying report.

Table 6b
Analytical Results for Metals in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			BH21-01	BH21-02	BH21-03		BH21-04	BH21-05	BH21-06	BH21-07	BH21-08	BH21-09	BH21-10	BH21-11	BH21-12	BH21-13	
Sample Name			21-01 SA2	BH21-02 SA2	BH21-03 SA2	BH21-03 SA22 (dup)	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-08 SA1	BH21-09 SA2	BH21-10 SA2	BH21-11 SA1	BH21-12 SA1	BH21-13 SA1	BH21-13 SA3
Sample Date			06/11/2021	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-19	2021-05-18	2021-05-13
Sample Depth (mbgs)			0.91-1.52 m	0.76-1.17 m	0.61-1.37 m	0.61-1.37 m	1.52-2.13 m	0-0.61 m	0.76-1.37 m	0.76-1.37 m	0-0.61 m	0.76-1.37 m	0.76-1.37 m	0-0.61 m	0-0.61 m	0-0.61 m	1.52-2.13 m
Parameter	MECP Table 7 Standards[1]	Unit															
Antimony	40	µg/g	1.5	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	18	µg/g	7	6	6	5	2	3	2	2	3	5	4	2	2	3	< 1
Barium	670	µg/g	211	131	339	207	320	175	157	74.0	130	125	133	102	73.5	188	65.6
Beryllium	8	µg/g	<0.4	< 0.4	< 0.4	0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.4	0.4	0.5	< 0.4	< 0.4	< 0.4	< 0.4
Boron	120	µg/g	11	9	10	8	< 5	< 5	< 5	< 5	< 5	7	6	6	< 5	< 5	5
Boron, Hot Water Soluble	2	µg/g	0.28	0.25	0.22	0.19	0.38	0.23	0.27	< 0.10	0.28	0.30	0.45	0.24	0.18	0.21	< 0.10
Cadmium	1.9	µg/g	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	160	µg/g	16	21	31	32	108	51	37	25	35	26	35	27	18	48	17
Hexavalent Chromium	8	µg/g	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cobalt	80	µg/g	6.7	6.7	12.8	10.5	21.2	12.0	9.6	6.2	10.1	10.3	9.6	8.2	5.9	11.8	5.7
Copper	230	µg/g	11.9	10.1	12.0	10.5	46.6	25.3	21.4	9.3	22.0	24.0	23.8	14.5	12.6	24.9	11.7
Lead	120	µg/g	83	59	75	42	37	18	24	9	13	56	28	18	11	18	4
Molybdenum	40	µg/g	3.8	1.3	1.4	0.7	0.7	0.9	0.8	0.5	1.0	1.4	1.3	< 0.5	0.8	0.7	< 0.5
Nickel	270	µg/g	11	12	18	16	56	29	22	13	22	20	21	15	11	29	9
Selenium	5.5	µg/g	<0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Silver	40	µg/g	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Thallium	3.3	µg/g	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Uranium	33	µg/g	0.63	0.94	0.70	0.63	1.09	0.79	0.85	0.67	0.97	0.79	0.80	0.67	0.63	0.78	0.59
Vanadium	86	µg/g	20.2	28.2	47.2	47.7	**104**	56.5	46.0	30.9	43.7	35.1	37.5	42.2	29.0	53.9	26.6
Zinc	340	µg/g	136	60	45	41	128	84	68	34	62	84	72	67	40	82	23
Mercury	3.9	µg/g	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Notes:

1	O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
mbgs	metres below ground surface
µg/g	microgram per gram
<	Indicates parameter was below laboratory equipment detection limit.
-	Chemical not analyzed or criteria not defined.
Bold and shaded	Exceeding MECP Table 7 Standards

Table to be read in conjunction with accompanying report.

Table 6c
Analytical Results for Petroleum Hydrocarbons and BTEX in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			BH21-01	BH21-02	BH21-03			BH21-04	BH21-05	BH21-06	BH21-07	BH21-08	BH21-09	BH21-10	BH21-11	BH21-12	BH21-13	
Sample Name			21-01 SA2	BH21-02 SA2	BH21-03 SA2	BH21-03 SA22 (dup)	BH21-03 SA3	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-08 SA1	BH21-09 SA2	BH21-10 SA1	BH21-11 SA1	BH21-12 SA1	BH21-13 SA1	BH21-13 SA3
Sample Date			06/11/2021	2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-19	2021-05-18	2021-05-13
Sample Depth (mbgs)			0.91-1.52 m	0.76-1.17 m	0.61-1.37 m	0.61-1.37 m	1.52-1.68 m	1.52-2.13 m	0-0.61 m	0.76-1.37 m	0.76-1.37 m	0-0.61 m	0.76-1.37 m	0-0.61 m	0-0.61 m	0-0.61 m	0-0.61 m	1.52-2.13 m
Parameter	MECP Table 7 Standards[1]	Unit																
PHC - F1 (C6-C10)-BTEX	55	µg/g	22	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
PHC - F2 (C10-C16) less Naphthalene	-	µg/g	<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
PHC - F3 (C16-C34) less PAHs	-	µg/g	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	51	< 50	< 50	< 50	< 50	< 50	< 50	< 50
PHC - F4 (C34-C50)	3300	µg/g	73	< 50	< 50	< 50	< 50	< 50	< 50	< 50	86	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Benzene	0.32	µg/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	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	68	µg/g	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	9.5	µg/g	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
o-Xylene	-	µg/g	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
m,p-Xylenes	-	µg/g	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Xylenes, Total	26	µg/g	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Notes:

1	O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
mbgs	metres below ground surface
µg/g	microgram per gram
<	Indicates parameter was below laboratory equipment detection limit.
-	Chemical not analyzed or criteria not defined.
Bold and shaded	Exceeding MECP Table 7 Standards

Table to be read in conjunction with accompanying report.

Table 6d
Analytical Results for Polycyclic Aromatic Hydrocarbons in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			BH21-01	BH21-02	BH21-03			BH21-04	BH21-05	BH21-06	BH21-07		BH21-08	BH21-09	BH21-10	BH21-11	BH21-12	BH21-13	
Sample Name			21-01 SA2	BH21-02 SA2	BH21-03 SA2	BH21-03 SA22 (dup)	BH21-03 SA3	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-07 SA3	BH21-08 SA1	BH21-09 SA2	BH21-10 SA1	BH21-11 SA1	BH21-12 SA1	BH21-13 SA1	BH21-13 SA3
Sample Date			06/11/2021	2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-17	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-19	2021-05-18	2021-05-13
Sample Depth (mbgs)			0.91-1.52 m	0.76-1.17 m	0.61-1.37 m	0.61-1.37 m	1.52-1.68 m	1.52-2.13 m	0-0.61 m	0.76-1.37 m	0.76-1.37 m	1.52-1.65 m	0-0.61 m	0.76-1.37 m	0-0.61 m	0-0.61 m	0-0.61 m	0-0.61 m	1.52-2.13 m
Parameter	**MECP Table 7 Standards[1]**	**Unit**																	
4-Methyl-2-pentanone	31	µg/g	-	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	-	-	-	-	-	-	< 0.50
Acenaphthene	96	µg/g	0.12	0.48	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.15	µg/g	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	0.67	µg/g	0.43	**0.84**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.10	0.05	< 0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[a]anthracene	0.96	µg/g	0.55	**2.61**	< 0.05	< 0.05	< 0.05	0.12	0.06	< 0.05	0.28	0.09	< 0.05	0.13	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Benzo[a]pyrene	0.3	µg/g	**0.46**	**1.86**	< 0.05	< 0.05	< 0.05	0.10	0.09	< 0.05	**0.38**	0.09	0.08	0.26	< 0.05	< 0.05	< 0.05	0.07	< 0.05
Benzo[b]fluoranthene	0.96	µg/g	0.62	**2.39**	< 0.05	< 0.05	< 0.05	0.20	0.15	< 0.05	0.40	0.09	0.10	0.38	0.06	< 0.05	0.08	0.11	< 0.05
Benzo[g,h,i]perylene	9.6	µg/g	0.17	0.68	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.17	< 0.05	< 0.05	0.13	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[k]fluoranthene	0.96	µg/g	0.52	**0.98**	< 0.05	< 0.05	< 0.05	0.17	0.13	< 0.05	0.19	< 0.05	< 0.05	0.19	< 0.05	< 0.05	< 0.05	0.10	< 0.05
Chrysene	9.6	µg/g	0.82	2.15	< 0.05	< 0.05	< 0.05	0.14	0.07	< 0.05	0.29	0.09	< 0.05	0.13	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Dibenzo[a,h]anthracene	0.1	µg/g	**0.29**	**0.26**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylnaphthalene	-	µg/g	<0.05	0.14	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	9.6	µg/g	1.36	6.27	0.05	< 0.05	< 0.05	0.27	0.14	< 0.05	0.51	0.24	0.11	0.37	< 0.05	0.06	0.06	0.13	< 0.05
Fluorene	62	µg/g	0.18	0.47	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno[1,2,3-cd]pyrene	0.76	µg/g	<0.05	0.76	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05	< 0.05	0.12	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	9.6	µg/g	<0.05	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	12	µg/g	1.12	4.85	< 0.05	< 0.05	< 0.05	0.12	0.05	< 0.05	0.19	0.12	0.05	0.27	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Pyrene	96	µg/g	1.09	4.80	< 0.05	< 0.05	< 0.05	0.23	0.12	< 0.05	0.44	0.19	0.09	0.30	< 0.05	< 0.05	0.05	0.12	< 0.05
Styrene	34	µg/g	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-	-	-	-	-	-	-	-	-	< 0.05

Notes:

1	O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
mbgs	metres below ground surface
µg/g	microgram per gram
<	Indicates parameter was below laboratory equipment detection limit.
-	Chemical not analyzed or criteria not defined.
Bold and shaded	Exceeding MECP Table 7 Standards

Table to be read in conjunction with accompanying report.

Table 6e
Analytical Results for Volatile Organic Compounds in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**BH21-02**	**BH21-03**			**BH21-13**
		Sample Name	**BH21-02 SA2**	**BH21-03 SA2**	**BH21-03 SA22 (dup)**	**BH21-03 SA3**	**BH21-13 SA3**
		Sample Date	**2021-05-18**	**2021-05-18**	**2021-05-18**	**2021-05-18**	**2021-05-13**
		Sample Depth (mgbs)	**0.76-1.17 m**	**0.61-1.37 m**	**0.61-1.37 m**	**1.52-1.68 m**	**1.52-2.13 m**
Parameter	**MECP Table 7 Standards[1]**	**Unit**					
1,1,1,2-Tetrachloroethane	0.087	µg/g	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
1,1,1-Trichloroethane	6.1	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	0.05	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	0.05	µg/g	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
1,1-Dichloroethane	17	µg/g	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
1,1-Dichloroethylene	0.064	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-DibroMECPthane	0.05	µg/g	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
1,2-Dichlorobenzene	6.8	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichloroethane	0.05	µg/g	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
1,2-Dichloropropane	0.16	µg/g	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
1,3-Dichlorobenzene	9.6	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichloropropene, Total	0.18	µg/g	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
1,4-Dichlorobenzene	0.2	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl Ethyl Ketone	70	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acetone	16	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	18	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromoform	0.61	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromomethane	0.05	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	0.21	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlorobenzene	2.4	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloroform	0.47	µg/g	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
cis-1,2-Dichloroethene	55	µg/g	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	13	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	16	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl tert-Butyl Ether	11	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylene Chloride	1.6	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
n-Hexane	46	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	4.5	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
trans-1,2-Dichloroethene	1.3	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Trichloroethene	0.91	µg/g	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Trichlorofluoromethane	4	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vinyl Chloride	0.032	µg/g	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Styrene	34	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl Isobutyl Ketone	31	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Notes:

1	O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
mbgs	metres below ground surface
µg/g	microgram per gram
<	Indicates parameter was below laboratory equipment detection limit.
-	Chemical not analyzed or criteria not defined.
Bold and shaded	Exceeding MECP Table 7 Standards

Table 6f
Quality Assurance and Control for Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Sample Name	Parent Sample	Duplicate Sample		
		Sample Name	BH21-03 SA2	BH21-03 SA22 (dup)		
		Sample Date	2021-05-18	2021-05-18	Calculated RPD[1]	Acceptance Criteria[2]
Parameter	**Unit**	**Reporting Limit**				
General Chemistry						
Conductivity	uS/cm	5.0	398	373	6.49%	≤10%
Moisture, Percent	%	0.1	19.1	6.9	93.85%	-
Sodium Adsorption Ratio	none	-	-	-	NC	-
Metals						
Antimony	µg/g	0.8	< 0.8	< 0.8	NC	≤30%
Arsenic	µg/g	1.0	6	5	18.18%	≤30%
Barium	µg/g	2.0	339	207	**48.35%**	≤30%
Beryllium	µg/g	0.4	< 0.4	0.4	NC	≤30%
Boron	µg/g	5.0	10	8	NC	≤30%
Cadmium	µg/g	0.5	< 0.5	< 0.5	NC	≤30%
Chromium	µg/g	5.0	31	32	3.17%	≤30%
Cobalt	µg/g	0.5	12.8	10.5	19.74%	≤30%
Copper	µg/g	1.0	12	10.5	13.33%	≤30%
Lead	µg/g	1.0	75	42	**56.41%**	≤30%
Molybdenum	µg/g	0.5	1.4	0.7	NC	≤30%
Nickel	µg/g	1.0	18	16	11.76%	≤30%
Selenium	µg/g	0.8	< 0.8	< 0.8	NC	≤30%
Silver	µg/g	0.5	< 0.5	< 0.5	NC	≤30%
Thallium	µg/g	0.5	< 0.5	< 0.5	NC	≤30%
Uranium	µg/g	0.5	0.7	0.63	NC	≤30%
Vanadium	µg/g	0.4	47.2	47.7	1.05%	≤30%
Zinc	µg/g	5.0	45	41	9.30%	≤30%
Hexavalent Chromium	µg/g	0.2	< 0.2	< 0.2	NC	≤30%
Boron, Hot Water Soluble	µg/g	0.1	0.22	0.19	NC	≤30%
Petroleum Hydrocarbons						
Benzene	µg/g	0.0	< 0.02	< 0.02	NC	≤30%
Toluene	µg/g	0.1	< 0.05	< 0.05	NC	≤30%
Ethylbenzene	µg/g	0.1	< 0.05	< 0.05	NC	≤30%
o-Xylene	µg/g	0.1	< 0.05	< 0.05	NC	≤30%
m,p-Xylenes	µg/g	0.1	< 0.05	< 0.05	NC	≤30%
Xylenes, Total	µg/g	0.1	< 0.05	< 0.05	NC	≤30%
PHC - F1 (C6-C10)	µg/g	5.0	< 5	< 5	NC	≤30%
PHC - F1 (C6-C10)-BTEX	µg/g	5.0	< 5	< 5	NC	≤30%
PHC - F2 (C10-C16)	µg/g	10.0	< 10	< 10	NC	≤30%
PHC - F2 (C10-C16) less Naphthalene	µg/g	10.0	< 10	< 10	NC	≤30%
PHC - F3 (C16-C34)	µg/g	50.0	< 50	< 50	NC	≤30%
PHC - F3 (C16-C34) less PAHs	µg/g	50.0	< 50	< 50	NC	≤30%
PHC - F4 (C34-C50)	µg/g	50.0	< 50	< 50	NC	≤30%
Polycyclic Aromatic Hydrocarbons						
4-Methyl-2-pentanone	µg/g	0.5	< 0.50	< 0.50	NC	≤40%
Acenaphthene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Acenaphthylene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Anthracene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Benzo[a]anthracene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Benzo[a]pyrene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Benzo[b]fluoranthene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Benzo[g,h,i]perylene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Benzo[k]fluoranthene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Chrysene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Chrysene-d12	%	1.0	70	80	13.33%	≤40%
Dibenzo[a,h]anthracene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Dimethylnaphthalene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Fluoranthene	µg/g	0.1	0.05	< 0.05	NC	≤40%
Fluorene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Indeno[1,2,3-cd]pyrene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Naphthalene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Phenanthrene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Pyrene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%
Styrene	µg/g	0.1	< 0.05	< 0.05	NC	≤40%

Table 6f
Quality Assurance and Control for Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Sample Name	Parent Sample	Duplicate Sample		
		Sample Name	BH21-03 SA2	BH21-03 SA22 (dup)		
		Sample Date	2021-05-18	2021-05-18	Calculated RPD[1]	Acceptance Criteria[2]
Parameter	**Unit**	**Reporting Limit**				
Volatile Organic Compounds						
1,1,1,2-Tetrachloroethane	µg/g	0.0	< 0.04	< 0.04	NC	≤50%
1,1,1-Trichloroethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
1,1,2,2-Tetrachloroethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
1,1,2-Trichloroethane	µg/g	0.0	< 0.04	< 0.04	NC	≤50%
1,1-Dichloroethane	µg/g	0.0	< 0.02	< 0.02	NC	≤50%
1,1-Dichloroethylene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
1,2-DibroMECPthane	µg/g	0.0	< 0.04	< 0.04	NC	≤50%
1,2-Dichlorobenzene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
1,2-Dichloroethane	µg/g	0.0	< 0.03	< 0.03	NC	≤50%
1,2-Dichloropropane	µg/g	0.0	< 0.03	< 0.03	NC	≤50%
1,3-Dichlorobenzene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
1,3-Dichloropropene, Total	µg/g	0.0	< 0.04	< 0.04	NC	≤50%
1,4-Dichlorobenzene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Methyl Ethyl Ketone	µg/g	0.5	< 0.50	< 0.50	NC	≤50%
Acetone	µg/g	0.5	< 0.50	< 0.50	NC	≤50%
Bromodichloromethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Bromoform	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Bromomethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Carbon Tetrachloride	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Chlorobenzene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Chloroform	µg/g	0.0	< 0.04	< 0.04	NC	≤50%
cis-1,2-Dichloroethene	µg/g	0.0	< 0.02	< 0.02	NC	≤50%
Dibromochloromethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Dichlorodifluoromethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Methyl tert-Butyl Ether	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Methylene Chloride	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
n-Hexane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Tetrachloroethylene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
trans-1,2-Dichloroethene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Trichloroethene	µg/g	0.0	< 0.03	< 0.03	NC	≤50%
Trichlorofluoromethane	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Vinyl Chloride	µg/g	0.0	< 0.02	< 0.02	NC	≤50%
Styrene	µg/g	0.1	< 0.05	< 0.05	NC	≤50%
Methyl Isobutyl Ketone	µg/g	0.5	< 0.50	< 0.50	NC	≤50%

Notes:

1	RPD values only calculated when results are >2.5 times the reportable detection limit.
2	O.Reg 153/04 (2011) Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.
RPD	Relative percent difference.
<	Indicates parameter was below laboratory equipment detection limit.
-	Chemical not analyzed or criteria not defined.
Bold and shaded	Exceeding MECP RPD Acceptance Criteria

Table to be read in conjunction with accompanying report.

Table 7a
Analytical Results for Other Regulated Parameters in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	BH21-02	BH21-03		BH21-05	BH21-06	BH21-10	MW17-2
		Sample Name	BH21-02	BH21-03	DUP-3	BH21-05	BH21-06	BH21-10	MW17-2
		Sample Date	2021-05-27	2021-05-27	2021-05-27	2021-05-27	2021-05-27	2021-05-27	05/27/2021
Parameter	**MECP Table 7 Standards[1]**	**Unit**							
Chloride	1,800,000	µg/L	**3,390,000**	103,000	173,000	5,710	18,400	5,440	19,000
Sodium	1,800,000	µg/L	**2,180,000**	217,000	217,000	29,500	85,900	29,000	42,400

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
µg/L microgram per Litre
Bold and shaded Exceeding MECP Table 7 Standards

Table 7b
Analytical Results for Metals in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**BH21-02**	**BH21-03**		**BH21-05**	**BH21-06**	**BH21-10**	**MW17-2**
		Sample Name	**BH21-02**	**BH21-03**	**DUP-3**	**BH21-05**	**BH21-06**	**BH21-10**	**MW17-2**
		Sample Date	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**05/27/2021**
Parameter	**MECP Table 7 Standards[1]**	**Unit**							
Antimony	16,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0
Arsenic	1,500	µg/L	17.9	3.6	1.1	1.6	< 1.0	< 1.0	3.9
Barium	23,000	µg/L	234	154	150	101	187	63.7	51.1
Beryllium	53	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Boron	36,000	µg/L	75	58.5	48.2	42.9	113	79.7	85.3
Cadmium	2	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Chromium	640	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<2.0
Hexavalent Chromium	110	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	<2
Cobalt	52	µg/L	< 0.50	0.58	< 0.50	0.64	1.6	0.78	1.07
Copper	69	µg/L	1.2	2.2	2.7	2.2	4.4	1.2	2
Lead	20	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	<0.50
Mercury		µg/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<0.02
Molybdenum	7,300	µg/L	10.5	1.7	1.37	4.92	1.83	5.66	1.9
Nickel	390	µg/L	4.2	< 3.0	< 3.0	3.7	12.6	3.7	3.9
Selenium	50	µg/L	< 1.0	3.9	4.2	2.1	3.5	2.7	3
Silver	1	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Thallium	400	µg/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	<0.30
Uranium	330	µg/L	2.46	1.92	1.82	3.06	1.87	2.8	2.9
Vanadium	200	µg/L	0.42	< 0.40	0.51	1.3	0.79	< 0.40	<0.40
Zinc	890	µg/L	18.1	< 5.0	< 5.0	10.3	6.3	< 5.0	236

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
µg/L microgram per Litre
Bold and shaded Exceeding MECP Table 7 Standards

Table 7c
Analytical Results for Petroleum Hydrocarbons and BTEX in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**BH21-02**	**BH21-03**		**BH21-05**	**BH21-06**	**BH21-10**	**MW17-2**	**Data Quality**
		Sample Name	**BH21-02**	**BH21-03**	**DUP-3**	**BH21-05**	**BH21-06**	**BH21-10**	**MW17-2**	**TRIP BLANK**
		Sample Date	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**05/27/2021**	
Parameter	**MECP Table 7 Standards[1]**	**Unit**								
Benzene	0.5	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20	<0.20
Toluene	320	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	0.81	< 0.20	<0.20	<0.20
Ethylbenzene	54	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10	<0.10
o-Xylene	-	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10	<0.20
m,p-Xylenes	-	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20	<0.10
Xylenes, Total	72	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20	<0.20
PHC - F1 (C6-C10)	420	µg/L	< 25	< 25	< 25	< 25	< 25	< 25	<25	<25
PHC - F1 (C6-C10)-BTEX	420	µg/L	< 25	< 25	< 25	< 25	< 25	< 25	<25	<25
PHC - F2 (C10-C16)	150	µg/L	< 100	< 100	< 100	< 100	< 100	< 100	<100	-
PHC - F2 (C10-C16) less Naphthalene	-	µg/L	< 100	< 100	< 100	< 100	< 100	< 100	<100	-
PHC - F3 (C16-C34)	500	µg/L	< 100	< 100	< 100	< 100	< 100	< 100	<100	-
PHC - F3 (C16-C34) less PAHs	-	µg/L	< 100	< 100	< 100	< 100	< 100	< 100	<100	-
PHC - F4 (C34-C50)	500	µg/L	< 100	< 100	< 100	< 100	< 100	< 100	<100	-

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
µg/L microgram per Litre
Bold and shaded Exceeding MECP Table 7 Standards

Table 7d
Analytical Results for Polycyclic Aromatic Hydrocarbons in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

			Location	BH21-02	BH21-03		BH21-05	BH21-06	BH21-10	MW17-2
			Sample Name	BH21-02	BH21-03	DUP-3	BH21-05	BH21-06	BH21-10	MW17-2
			Sample Date	2021-05-27	2021-05-27	2021-05-27	2021-05-27	2021-05-27	2021-05-27	05/27/2021
Parameter	MECP Table 7 Standards[1]	Unit								
4-Methyl-2-pentanone	5,200	µg/L		< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	<1.0
Acenaphthene	17	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Acenaphthylene	1	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Anthracene	1	µg/L		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Benzo[a]anthracene	1.8	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Benzo[a]pyrene	0.81	µg/L		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Benzo[b]fluoranthene	0.75	µg/L		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Benzo[g,h,i]perylene	0.2	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Benzo[k]fluoranthene	0.4	µg/L		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Chrysene	0.7	µg/L		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Dibenzo[a,h]anthracene	0.4	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Fluoranthene	44	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Fluorene	290	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Indeno[1,2,3-cd]pyrene	0.2	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Naphthalene	7	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Phenanthrene	380	µg/L		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Pyrene	5.7	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20
Styrene	43	µg/L		< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
1- & 2-Methylnaphthalene	1,800	µg/L		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.20

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.

< Indicates parameter was below laboratory equipment detection limit.

- Chemical not analyzed or criteria not defined.

µg/L	microgram per Litre
Bold and shaded	Exceeding MECP Table 7 Standards

Table 7e
Analytical Results for Volatile Organic Compounds in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**BH21-02**	**BH21-03**		**BH21-05**	**BH21-06**	**BH21-10**	**MW17-2**
		Sample Name	**BH21-02**	**BH21-03**	**DUP-3**	**BH21-05**	**BH21-06**	**BH21-10**	**MW17-2**
		Sample Date	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**2021-05-27**	**05/27/2021**
Parameter	**MECP Table 7 Standards[1]**	**Unit**							
1,1,1,2-Tetrachloroethane	1.1	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
1,1,1-Trichloroethane	23	µg/L	< 0.60	< 0.30	< 0.30	< 0.30	< 0.60	< 0.30	<0.30
1,1,2,2-Tetrachloroethane	0.5	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
1,1,2-Trichloroethane	0.5	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
1,1-Dichloroethane	11	µg/L	< 0.60	< 0.30	< 0.30	< 0.30	< 0.60	< 0.30	<0.30
1,1-Dichloroethylene	0.5	µg/L	***< 0.60***	< 0.30	< 0.30	< 0.30	***< 0.60***	< 0.30	<0.30
1,2-DibroMECPthane	0.2	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
1,2-Dichlorobenzene	150	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
1,2-Dichloroethane	0.5	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
1,2-Dichloropropane	0.58	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
1,3-Dichlorobenzene	7,600	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
1,3-Dichloropropene, Total	0.5	µg/L	***< 0.60***	< 0.30	< 0.30	< 0.30	***< 0.60***	< 0.30	<0.30
1,4-Dichlorobenzene	0.5	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
Methyl Ethyl Ketone	21,000	µg/L	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	<1.0
Acetone	100,000	µg/L	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	<1.0
Bromodichloromethane	67,000	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Bromoform	5	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
Bromomethane	1	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Carbon Tetrachloride		µg/L	***< 0.40***	< 0.20	< 0.20	< 0.20	***< 0.40***	< 0.20	<0.20
Chlorobenzene	140	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
Chloroform	2	µg/L	< 0.40	1.06	0.87	**2.09**	**2.09**	1.98	<0.20
cis-1,2-Dichloroethene	2	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Dibromochloromethane	65,000	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
Dichlorodifluoromethane	3,500	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Methyl tert-Butyl Ether	15	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Methylene Chloride	26	µg/L	< 0.60	< 0.30	< 0.30	< 0.30	< 0.60	< 0.30	<0.30
n-Hexane	5	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Tetrachloroethylene	0.5	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
trans-1,2-Dichloroethene	1.6	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Trichloroethene	0.5	µg/L	< 0.40	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	<0.20
Trichlorofluoromethane	2,000	µg/L	< 0.80	< 0.40	< 0.40	< 0.40	< 0.80	< 0.40	<0.40
Vinyl Chloride	1	µg/L	< 0.34	< 0.17	< 0.17	< 0.17	< 0.34	< 0.17	<0.17
Styrene	43	µg/L	< 0.20	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	<0.10
Methyl Isobutyl Ketone	5,200	µg/L	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	<1.0

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.

µg/L	microgram per Litre
Bold and italicised	Detection limit above MECP Table 7 Standards
Bold and shaded	Exceeding MECP Table 7 Standards

Table 7f
Quality Assurance and Control for Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Sample Name	Parent Sample	Duplicate Sample		
		Sample Name	BH21-03	DUP-3	Calculated RPD[1]	Acceptance Criteria[2]
		Sample Date	2021-05-27	2021-05-27		
Parameter	**Unit**	**Reporting Limit**				
General Chemistry						
Chloride	µg/L	244	103000	173000	**50.72%**	≤20%
Metals						
Antimony	µg/L	1	< 1.0	< 1.0	NC	≤20%
Arsenic	µg/L	1	3.6	1.1	NC	≤20%
Barium	µg/L	2	154	150	2.63%	≤20%
Beryllium	µg/L	0.5	< 0.5	< 0.5	NC	≤20%
Boron	µg/L	10	58.5	48.2	19.31%	≤20%
Cadmium	µg/L	0.2	< 0.20	< 0.20	NC	≤20%
Chromium	µg/L	2	< 2.0	< 2.0	NC	≤20%
Hexavalent Chromium	µg/L	2	< 2	< 2	NC	≤20%
Cobalt	µg/L	0.5	0.58	< 0.50	NC	≤20%
Copper	µg/L	1	2.2	2.7	NC	≤20%
Lead	µg/L	0.5	< 0.50	< 0.50	NC	≤20%
Mercury	µg/L	0.02	< 0.02	< 0.02	NC	≤20%
Molybdenum	µg/L	0.5	1.7	1.37	NC	≤20%
Nickel	µg/L	3	< 3.0	< 3.0	NC	≤20%
Selenium	µg/L	1	3.9	4.2	NC	≤20%
Silver	µg/L	0.2	< 0.20	< 0.20	NC	≤20%
Sodium	µg/L	500	217000	217000	0.00%	≤20%
Thallium	µg/L	0.3	< 0.30	< 0.30	NC	≤20%
Uranium	µg/L	0.5	1.92	1.82	NC	≤20%
Vanadium	µg/L	0.4	< 0.40	0.51	NC	≤20%
Zinc	µg/L	5	< 5.0	< 5.0	NC	≤20%
Petroleum Hydrocarbons						
Benzene	µg/L	25	< 0.20	< 0.20	NC	≤30%
Toluene	µg/L	25	< 0.20	< 0.20	NC	≤30%
Ethylbenzene	µg/L	100	< 0.10	< 0.10	NC	≤30%
o-Xylene	µg/L	100	< 0.10	< 0.10	NC	≤30%
m,p-Xylenes	µg/L	100	< 0.20	< 0.20	NC	≤30%
Xylenes, Total	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
PHC - F1 (C6-C10)	µg/L	0.4	< 25	< 25	NC	≤30%
PHC - F1 (C6-C10)-BTEX	µg/L	0.2	< 25	< 25	NC	≤30%
PHC - F2 (C10-C16)	µg/L	0.2	< 100	< 100	NC	≤30%
PHC - F2 (C10-C16) less Naphthalene	µg/L	0.4	< 100	< 100	NC	≤30%
PHC - F3 (C16-C34)	µg/L	0.4	< 100	< 100	NC	≤30%
PHC - F3 (C16-C34) less PAHs	µg/L	100	< 100	< 100	NC	≤30%
PHC - F4 (C34-C50)	µg/L	100	< 100	< 100	NC	≤30%
Polycyclic Aromatic Hydrocarbons						
4-Methyl-2-pentanone	µg/L	2	< 1.0	< 1.0	NC	≤30%
Acenaphthene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Acenaphthylene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Anthracene	µg/L	0.1	< 0.10	< 0.10	NC	≤30%
Benzo[a]anthracene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Benzo[a]pyrene	µg/L	0.01	< 0.01	< 0.01	NC	≤30%
Benzo[b]fluoranthene	µg/L	0.1	< 0.10	< 0.10	NC	≤30%
Benzo[g,h,i]perylene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Benzo[k]fluoranthene	µg/L	0.1	< 0.10	< 0.10	NC	≤30%
Chrysene	µg/L	0.1	< 0.10	< 0.10	NC	≤30%
Dibenzo[a,h]anthracene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Fluoranthene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Fluorene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Indeno[1,2,3-cd]pyrene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Naphthalene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Phenanthrene	µg/L	0.1	< 0.10	< 0.10	NC	≤30%
Pyrene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%
Styrene	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
1- & 2-Methylnaphthalene	µg/L	0.2	< 0.20	< 0.20	NC	≤30%

Table 7f
Quality Assurance and Control for Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

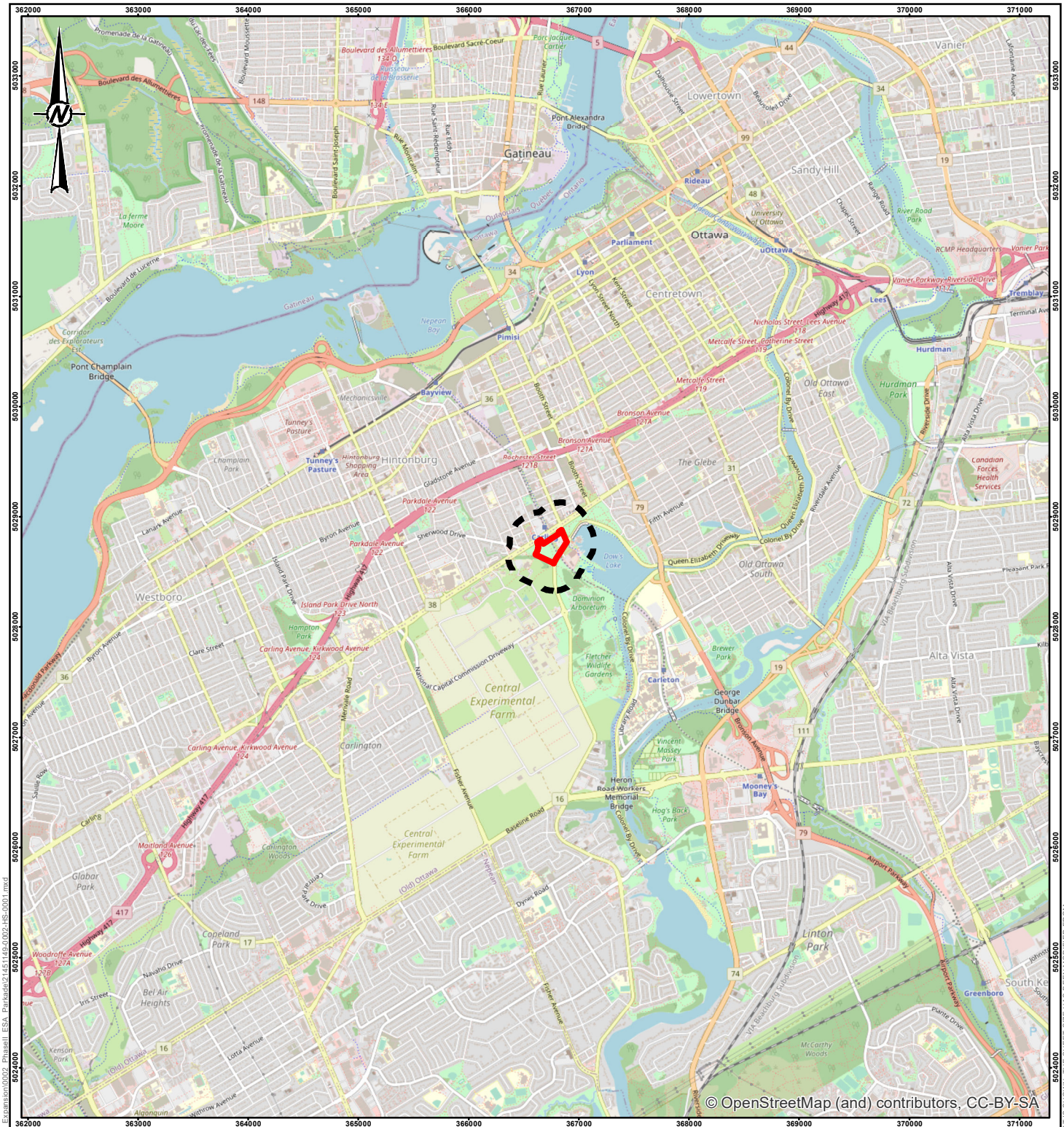
		Sample Name	Parent Sample	Duplicate Sample		
		Sample Name	BH21-03	DUP-3	Calculated RPD[1]	Acceptance Criteria[2]
		Sample Date	2021-05-27	2021-05-27		
Parameter	**Unit**	**Reporting Limit**				
Volatile Organic Compounds						
1,1,1,2-Tetrachloroethane	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
1,1,1-Trichloroethane	µg/L	0.6	< 0.30	< 0.30	NC	≤30%
1,1,2,2-Tetrachloroethane	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
1,1,2-Trichloroethane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
1,1-Dichloroethane	µg/L	0.6	< 0.30	< 0.30	NC	≤30%
1,1-Dichloroethylene	µg/L	0.6	< 0.30	< 0.30	NC	≤30%
1,2-DibroMECPthane	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
1,2-Dichlorobenzene	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
1,2-Dichloroethane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
1,2-Dichloropropane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
1,3-Dichlorobenzene	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
1,3-Dichloropropene, Total	µg/L	0.6	< 0.30	< 0.30	NC	≤30%
1,4-Dichlorobenzene	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
Methyl Ethyl Ketone	µg/L	0.2	< 1.0	< 1.0	NC	≤30%
Acetone	µg/L	2	< 1.0	< 1.0	NC	≤30%
Bromodichloromethane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Bromoform	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
Bromomethane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Carbon Tetrachloride	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Chlorobenzene	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
Chloroform	µg/L	0.4	1.06	0.87	NC	≤30%
cis-1,2-Dichloroethene	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Dibromochloromethane	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
Dichlorodifluoromethane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Methyl tert-Butyl Ether	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Methylene Chloride	µg/L	0.6	< 0.30	< 0.30	NC	≤30%
n-Hexane	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Tetrachloroethylene	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
trans-1,2-Dichloroethene	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Trichloroethene	µg/L	0.4	< 0.20	< 0.20	NC	≤30%
Trichlorofluoromethane	µg/L	0.8	< 0.40	< 0.40	NC	≤30%
Vinyl Chloride	µg/L	0.34	< 0.17	< 0.17	NC	≤30%
Styrene	µg/L	0.2	< 0.10	< 0.10	NC	≤30%
Methyl Isobutyl Ketone	µg/L	0.2	< 1.0	< 1.0	NC	≤30%

Notes:
[1] RPD values only calculated when results are >2.5 times the reportable detection limit.
[2] O.Reg 153/04 (2011) Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.
RPD: Relative percent difference.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or calculated.

µg/L	microgram per Litre
Bold and shaded	Exceeding MECP RPD Acceptance Criteria

Table to be read in conjunction with accompanying report.
Where multiple reporting limits exist within the sample set, the highest reporting limit is used.

Figures



LEGEND

PHASE ONE STUDY AREA

PHASE TWO SITE BOUNDARY AND RSC PROPERTY

0 500 1,000 2,000

1:50,000 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

PARSONS INC.

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE

KEY PLAN

CONSULTANT

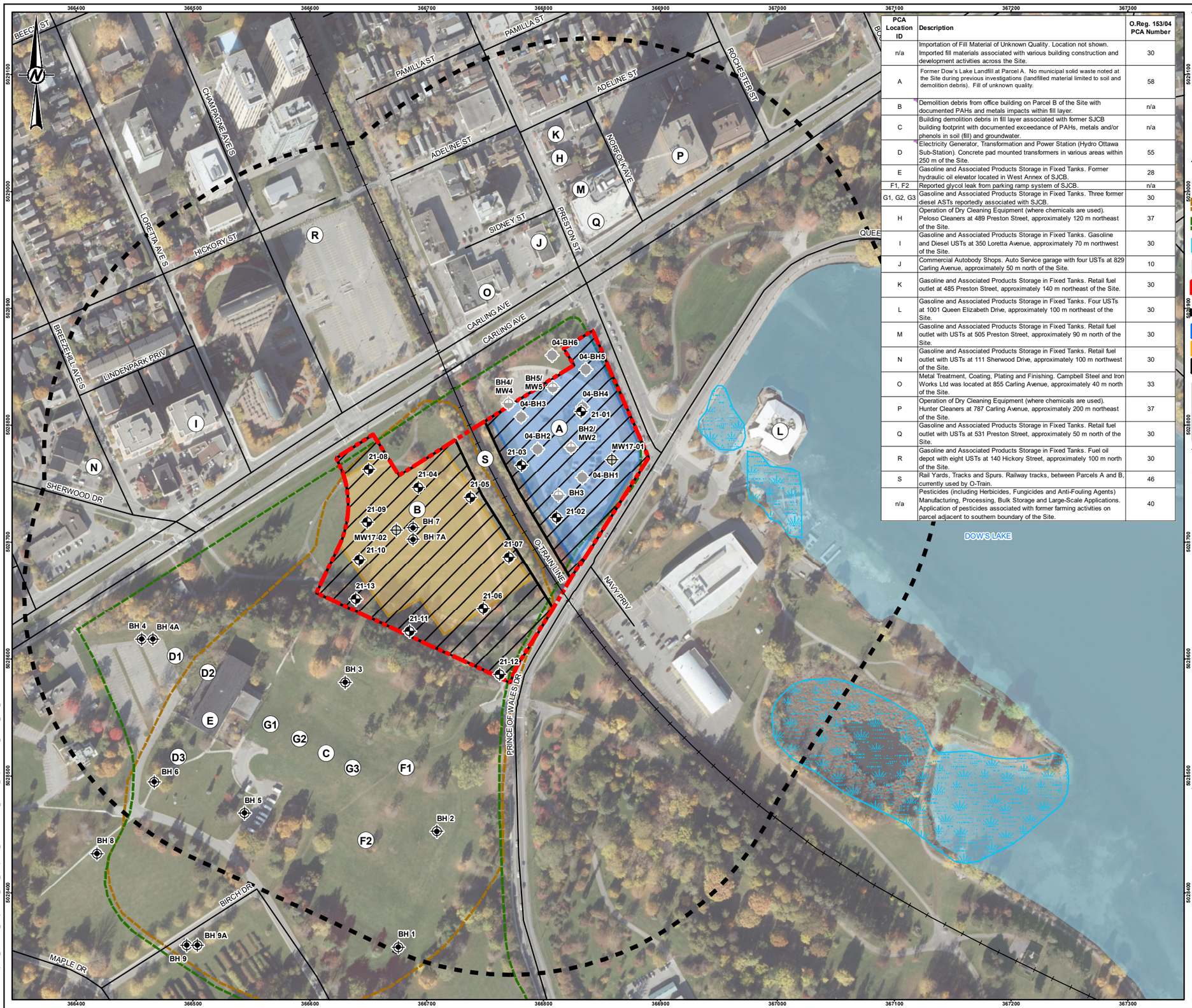
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-17
DESIGNED	----
PREPARED	JEM
REVIEWED	RM
APPROVED	KPH

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	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\Ottawa_Hospital\New_Civic_Campus\99_PROJ\21451149_Parsons_Expansion\0002_Phase II_ESA_Parkade\21451149-0002-HS-0001.mxd



PCA Location ID	Description	O.Reg. 153/04 PCA Number
n/a	Importation of Fill Material of Unknown Quality. Location not shown. Imported fill materials associated with various building construction and development activities across the Site.	30
A	Former Dow's Lake Landfill at Parcel A. No municipal solid waste noted at the Site during previous investigations (landfilled material limited to soil and demolition debris). Fill of unknown quality.	58
B	Demolition debris from office building on Parcel B of the Site with documented PAHs and metals impacts within fill layer.	n/a
C	Building demolition debris in fill layer associated with former SJCB building footprint with documented exceedance of PAHs, metals and/or phenols in soil (fill) and groundwater.	n/a
D	Electricity Generator, Transformation and Power Station (Hydro Ottawa Sub-Station). Concrete pad mounted transformers in various areas within 250 m of the Site.	55
E	Gasoline and Associated Products Storage in Fixed Tanks. Former hydraulic oil elevator located in West Annex of SJCB.	28
F1, F2	Reported glycol leak from parking ramp system of SJCB.	n/a
G1, G2, G3	Gasoline and Associated Products Storage in Fixed Tanks. Three former diesel ASTs reportedly associated with SJCB.	30
H	Operation of Dry Cleaning Equipment (where chemicals are used). Peloso Cleaners at 489 Preston Street, approximately 120 m northeast of the Site.	37
I	Gasoline and Associated Products Storage in Fixed Tanks. Gasoline and Diesel USTs at 350 Loretta Avenue, approximately 70 m northwest of the Site.	30
J	Commercial Autobody Shops. Auto Service garage with four USTs at 829 Carling Avenue, approximately 50 m north of the Site.	10
K	Gasoline and Associated Products Storage in Fixed Tanks. Retail fuel outlet at 485 Preston Street, approximately 140 m northeast of the Site.	30
L	Gasoline and Associated Products Storage in Fixed Tanks. Four USTs at 1001 Queen Elizabeth Drive, approximately 100 m northeast of the Site.	30
M	Gasoline and Associated Products Storage in Fixed Tanks. Retail fuel outlet with USTs at 505 Preston Street, approximately 90 m north of the Site.	30
N	Gasoline and Associated Products Storage in Fixed Tanks. Retail fuel outlet with USTs at 111 Sherwood Drive, approximately 100 m northwest of the Site.	30
O	Metal Treatment, Coating, Plating and Finishing. Campbell Steel and Iron Works Ltd was located at 855 Carling Avenue, approximately 40 m north of the Site.	33
P	Operation of Dry Cleaning Equipment (where chemicals are used). Hunter Cleaners at 787 Carling Avenue, approximately 200 m northeast of the Site.	37
Q	Gasoline and Associated Products Storage in Fixed Tanks. Retail fuel outlet with USTs at 531 Preston Street, approximately 50 m north of the Site.	30
R	Gasoline and Associated Products Storage in Fixed Tanks. Fuel oil depot with eight USTs at 140 Hickory Street, approximately 100 m north of the Site.	30
S	Rail Yards, Tracks and Spurs. Railway tracks, between Parcels A and B, currently used by O-Train.	46
n/a	Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications. Application of pesticides associated with former farming activities on parcel adjacent to southern boundary of the Site.	40

LEGEND

- APPROXIMATE BOREHOLE LOCATION (GOLDER 2021)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (STANTEC, 2017)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 SUPP PHASE II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 PHASE I/II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (PATERSON, 2017)
- ROADWAY
- O-TRAIN RAILWAY TRACK
- EXTENT OF ESTIMATED SOIL CONTAMINATION FROM STANTENC INVESTIGATIONS
- EXTENT OF ESTIMATED GROUNDWATER CONTAMINATION FROM STANTENC INVESTIGATIONS
- WETLAND
- WATERBODY
- PHASE TWO SITE BOUNDARY AND RSC PROPERTY
- PHASE ONE STUDY AREA
- APEC 1
- APEC 2
- APEC 3

APEC	Description	O .Reg. 153/04 PCA Number
1	Former Dow's Lake Landfill	58
2	Demolition debris from former office building	n/a
3	Imported fill materials of unknown quality	30

REFERENCE(S)

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

0 30 60 120

1:3,250 METRES

CLIENT
PARSONS INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE
SITE PLAN

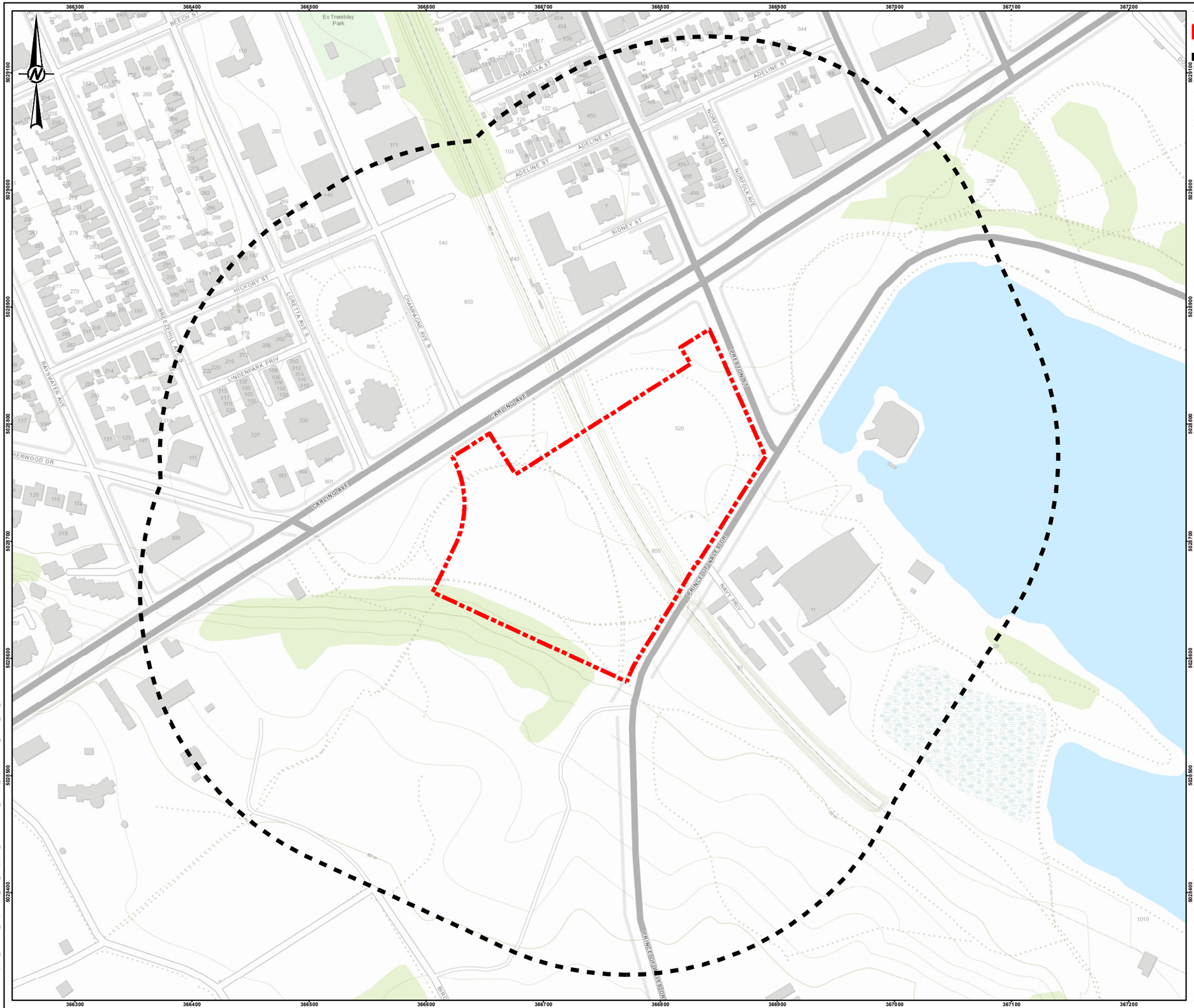
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-13
DESIGNED	---
PREPARED	JEM
REVIEWED	RM
APPROVED	KPH

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	0002	0	2

Path: N:\Active\Spatial_IM\Ottawa_Hospital\New_Civic_Campus\99_PROJ\21451149_Parsons_Expansion\0002_Phase_ESA_Parkade\21451149-0002-HS-0002.mxd

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



LEGEND

PHASE TWO SITE BOUNDARY AND RSC PROPERTY

PHASE ONE STUDY AREA

REFERENCE(S)

1. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 30 60 120

1:3,250 METRES

CLIENT
PARSONS INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE
TOPOGRAPHIC MAP AND AREAS OF NATURAL SIGNIFICANCE

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-13
DESIGNED	----
PREPARED	JEM
REVIEWED	RM
APPROVED	KPH

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	0002	0	3

Path: N:\Active\Spatial_IM\Ottawa_Hospital\New_Civic_Campus\99_PROJ\21451149_Parsons_Expansion\0002_PhaseII_ESA_Parkade\21451149-0002-HS-0003.mxd

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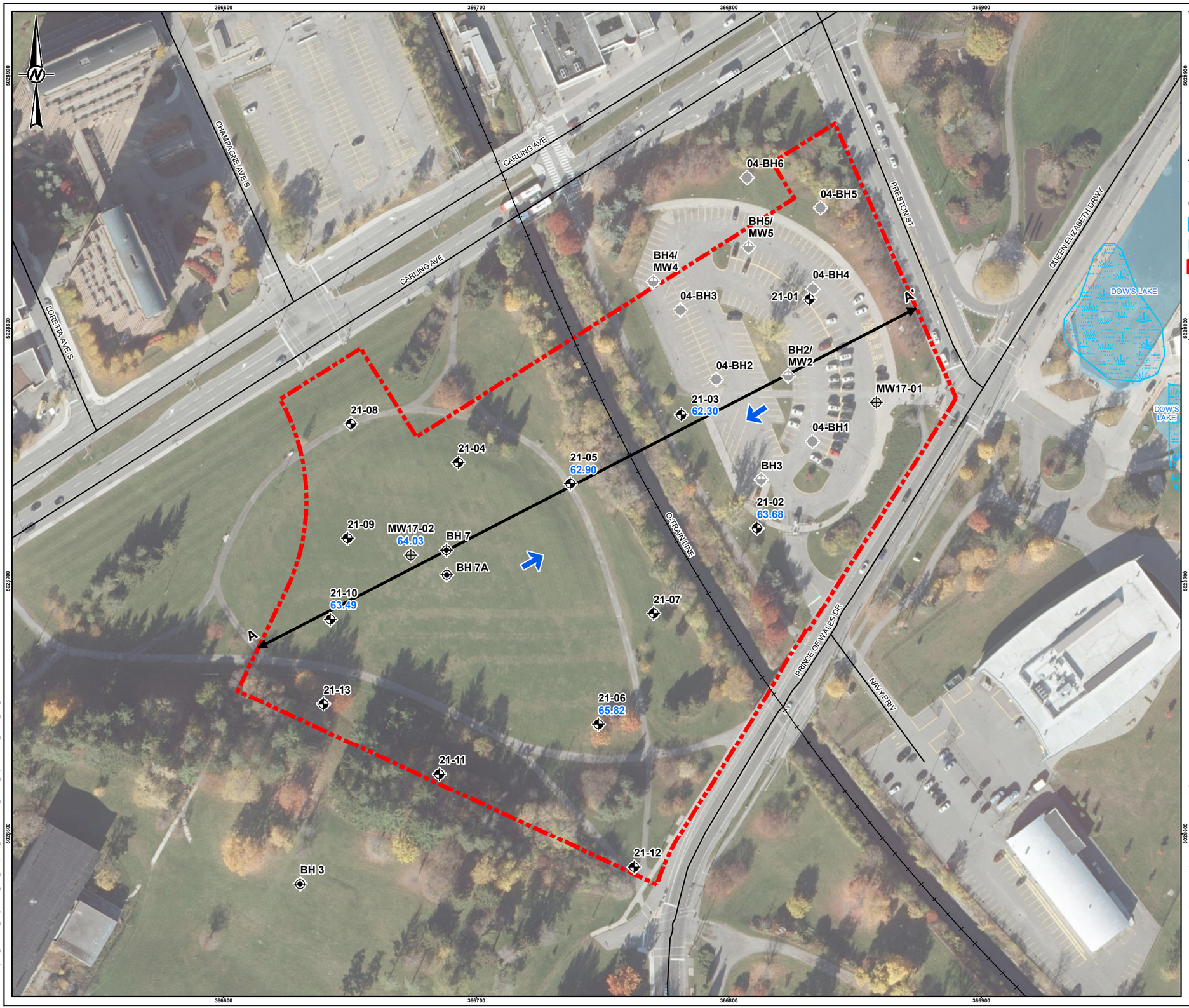
0



LEGEND

- APPROXIMATE BOREHOLE LOCATION (GOLDER 2021)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (STANTEC, 2017)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 SUPP PHASE II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 PHASE I/II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (PATERSON, 2017)
- ROADWAY
- O-TRAIN RAILWAY TRACK
- CROSS-SECTION LOCATION
- WETLAND
- WATERBODY
- PHASE TWO SITE BOUNDARY AND RSC PROPERTY
- 99.99 GROUNDWATER ELEVATION, mASL (MAY 27, 2021)
- INFERRED GROUNDWATER FLOW DIRECTION

REFERENCE(S)

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

0 15 30 60

1:1,500 METRES

CLIENT

PARSONS INC.

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE

SHALLOW GROUNDWATER ELEVATIONS AND INTERPRETED GROUNDWATER FLOW DIRECTION

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-13
DESIGNED	----
PREPARED	JEM
REVIEWED	RM
APPROVED	KPH

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	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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Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
BH5	Anthracene	0.67	0.68
	Benzo[a]anthracene	0.96	1.8
	Benzo[a]pyrene	0.3	1.4
	Benzo[b]fluoranthene	0.96	2
	Dibenzo[a,h]anthracene	0.1	0.28

Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
04-BH6	Acenaphthylene	0.15	0.5
	Anthracene	0.67	1.5
	Benzo[a]anthracene	0.96	3.4
	Benzo[a]pyrene	0.3	2.7
	Benzo[b]fluoranthene	0.96	3.5
	Benzo[k]fluoranthene	0.96	1.4
	Dibenzo[a,h]anthracene	0.1	0.48
	Indeno[1,2,3-cd]pyrene	0.76	1.4

Location	Parameter	MOE Table 7 Standards[1]	Concentration
BH21-01	Conductivity	1400 µS/cm	2860 µS/cm
	Benzo[a]pyrene	0.3 µg/g	0.46 µg/g
	Dibenzo[a,h]anthracene	0.1 µg/g	0.29 µg/g

Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
SS-1	Anthracene	0.67	2.4
	Benzo[a]anthracene	0.96	5.6
	Benzo[a]pyrene	0.3	4.2
	Benzo[b]fluoranthene	0.96	6.6
	Dibenzo[a,h]anthracene	0.1	0.4
	Fluoranthene	9.6	14
	Indeno[1,2,3-cd]pyrene	0.76	2

Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
SS-4	Benzo[a]pyrene	0.3	0.78
	Dibenzo[a,h]anthracene	0.1	0.16

Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
BH21-04	Vanadium	86	104

Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
BH21-02	Anthracene	0.67	0.84
	Benzo[a]anthracene	0.96	2.61
	Benzo[a]pyrene	0.3	1.86
	Benzo[b]fluoranthene	0.96	2.39
	Benzo[k]fluoranthene	0.96	0.98
	Dibenzo[a,h]anthracene	0.1	0.26

Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/g)
BH21-07	Benzo[a]pyrene	0.3	0.38

366600 366700 366800 366900 367000

5028900 5028800 5028700 5028600

CARLING AVE
CHAMPAGNE AV
LORETTA AVE S
PRESTON ST
QUEEN ELIZABETH DRWY
DOW'S LAKE
O-TRAIN LINE
PRINCE OF WALES DR
NAVY PRIV

04-BH6 SS-2 04-BH5 BH5/ MW5 SS-1 BH4/ MW4 04-BH4 04-BH3 21-01 BH2/ MW2 04-BH2 SS-5 MW17-01 21-03 SS-4 04-BH1 BH3 21-02 SS-3 21-07 21-08 21-04 21-05 21-09 MW17-02 BH 7 BH 7A 21-10 21-13 21-06 21-11 21-12 BH 3

LEGEND

- APPROXIMATE BOREHOLE LOCATION (GOLDER 2021)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (STANTEC, 2017)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (PATERSON, 2017)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 SUPP PHASE II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 PHASE I/II)
- PREVIOUS ENVIRONMENTAL SUB-SAMPLE LOCATION (INTERA, 2005 RA)
- PREVIOUS ENVIRONMENTAL COMPOSITE SURFICIAL SOIL SAMPLING LOCATION (INTERA, 2005 RA)
- VANADIUM IS OF NATURAL ORIGIN AND MEETS STANDARDS
- EXCEEDS MECP TABLE 7 SITE STANDARDS
- ROADWAY
- O-TRAIN RAILWAY TRACK
- WETLAND
- WATERBODY
- EXTENT OF PAH IMPACTS
- PHASE TWO SITE BOUNDARY AND RSC PROPERTY

REFERENCE(S)
1. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 15 30 60
1:1,500 METRES

CLIENT
PARSONS INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE
SOIL EXEEDANCES AND DELINEATION

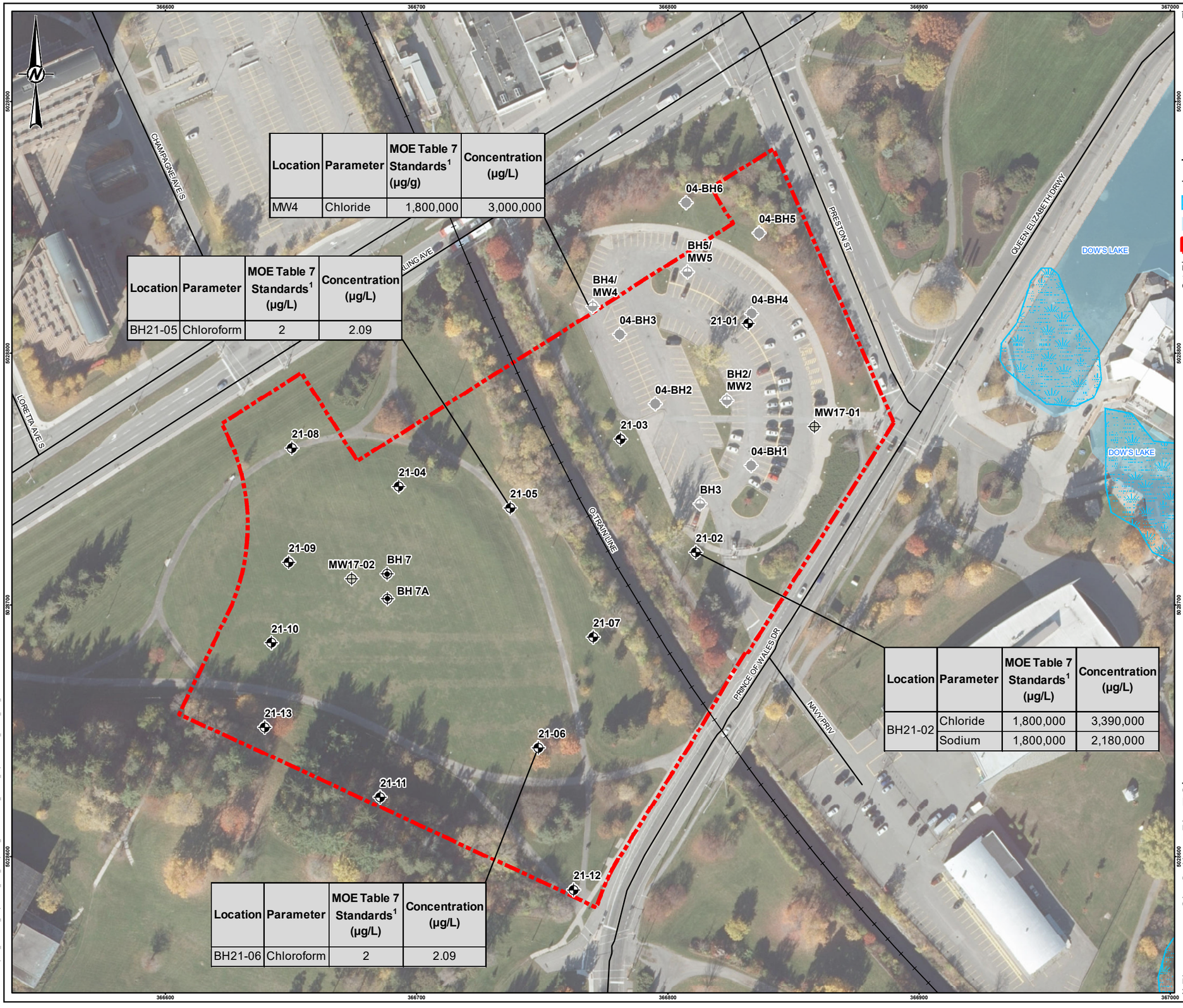
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-13
DESIGNED	----
PREPARED	JEM
REVIEWED	RM
APPROVED	KPH

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	0002	0	5

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

Path: N:\Active\Spatial_IM\Ottawa_Hospital\New_Civic_Campus\99_PRO\21451149_Parsons_Expansion\0002_Phase\I_ESA_Parkade\21451149-0002-HS-0005.mxd



Location	Parameter	MOE Table 7 Standards[1] (µg/g)	Concentration (µg/L)
MW4	Chloride	1,800,000	3,000,000

Location	Parameter	MOE Table 7 Standards[1] (µg/L)	Concentration (µg/L)
BH21-05	Chloroform	2	2.09

Location	Parameter	MOE Table 7 Standards[1] (µg/L)	Concentration (µg/L)
BH21-02	Chloride	1,800,000	3,390,000
	Sodium	1,800,000	2,180,000

Location	Parameter	MOE Table 7 Standards[1] (µg/L)	Concentration (µg/L)
BH21-06	Chloroform	2	2.09

LEGEND

- APPROXIMATE BOREHOLE LOCATION (GOLDER 2021)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (STANTEC, 2017)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 SUPP PHASE II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (INTERA, 2004 PHASE I/II)
- PREVIOUS ENVIRONMENTAL BOREHOLE OR MONITORING WELL LOCATION (PATERSON, 2017)
- ROADWAY
- O-TRAIN RAILWAY TRACK
- WETLAND
- WATERBODY
- PHASE TWO SITE BOUNDARY AND RSC PROPERTY

REFERENCE(S)

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

0 15 30 60

1:1,500 METRES

CLIENT

PARSONS INC.

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE

GROUNDWATER EXEEDANCES AND DELINEATION

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-13
DESIGNED	----
PREPARED	JEM
REVIEWED	RM
APPROVED	KPH

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	0002	0	6

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

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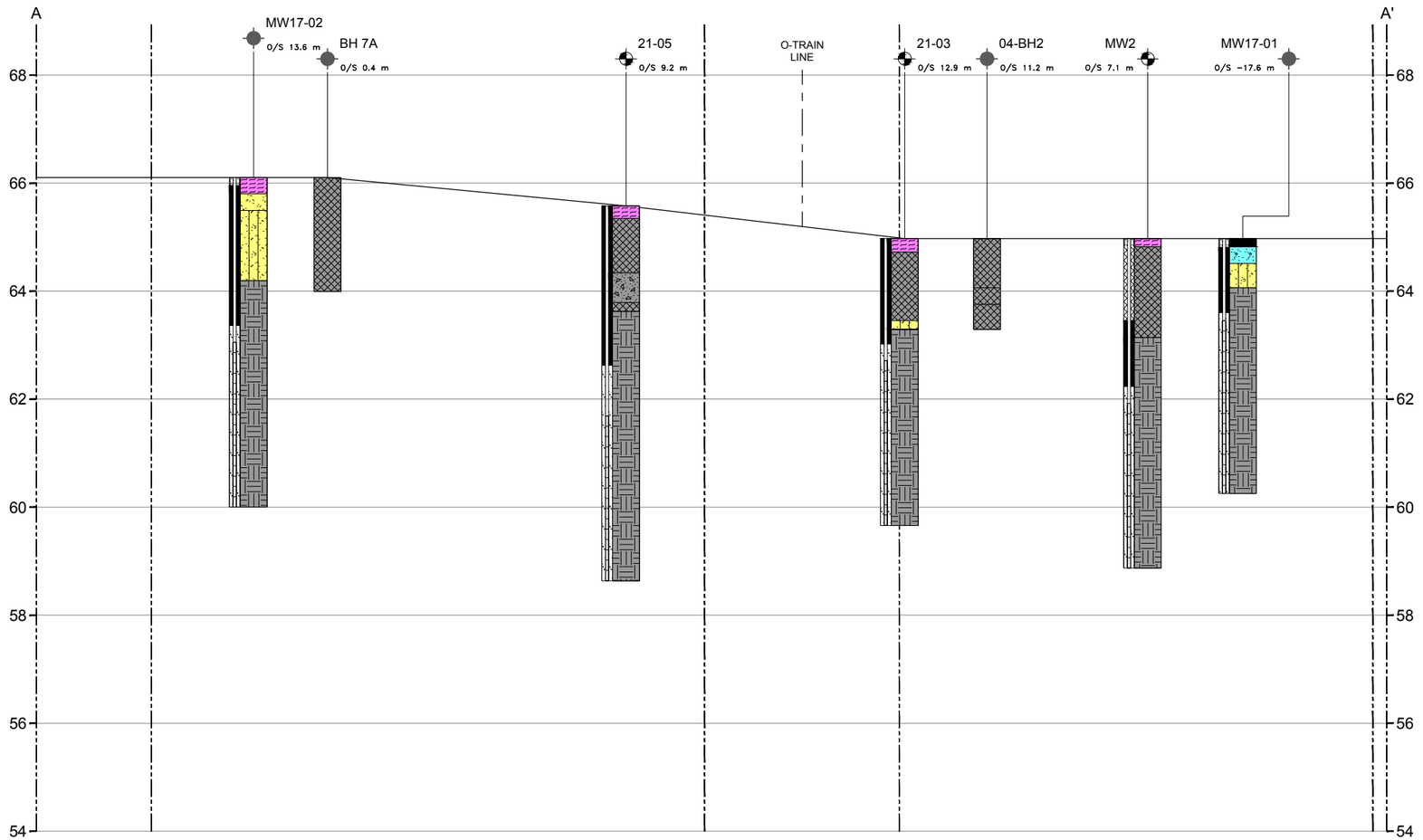
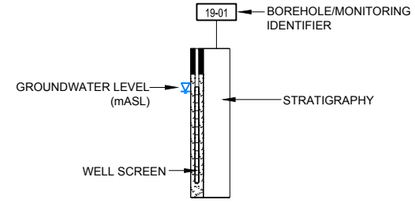


LEGEND

- SITE BOUNDARY
- BOREHOLE
- HISTORICAL BOREHOLE



SOIL STRATIGRAPHY

- FILL
- TOPSOIL
- ASPHALT
- SAND
- SAND AND GRAVEL
- SILTY SAND
- SILTY CLAY
- GLACIAL TILL
- BEDROCK

NOTE(S)

1. ELEVATION OF HISTORICAL BOREHOLES ARE APPROXIMATE.

CLIENT
PARSONS INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

TITLE
INTERPRETED CROSS-SECTION A-A'

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-06-15
DESIGNED	----
PREPARED	ZS
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
21451149	0002	A	7

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

0 25 mm

APPENDIX A

Sampling and Analysis Plan

GOLDER
MEMBER OF WSP

MEMORANDUM

DATE 11 May 2021 21451149-M02

TO Robert Ireland, Field Staff
Golder

CC Keith Holmes, Kim MacDonald, Lobke Rotteveel, Rochelle Matthew

FROM Laura Jones **EMAIL Laura_Jones@golder.com**

SAMPLING ANALYSIS PLAN – NEW CIVIC DEVELOPMENT FOR THE OTTAWA HOSPITAL - PARKADE

OBJECTIVE

The intent of the current investigation is to further characterize the lateral and vertical extent of soil and groundwater impacts identified at the Site (Parcels A and B of the Phase One Environmental Site Assessment (ESA) to support a Phase Two ESA.

SITE BACKGROUND

The new Ottawa Hospital campus was formerly occupied by a number of properties owned by the Crown which previously operated for commercial, industrial, and residential land uses. As part of redevelopment to a parkade structure and associated roadway and utilities modification (commercial land use) a Phase II ESA will be required.

A Phase I ESA was completed in 2019 and identified the following Areas of Potential Environmental Concern (APECs) on Site:

APEC 1 Former Dow's Lake landfill.

APEC 2 Demolition debris from former office building on Parcel B.

APEC 3 Imported fill materials associated with various building construction and site development activities across the site.

Surficial geology maps indicate the Site is underlain by a number of major soil types. The southwestern portion of the Site is indicated to be overlain by marine deposits (silt and clay), while the northern and eastern portions are indicated to be underlain by shallow bedrock and glacial till.

Drift thickness (depth to bedrock) indicated in available mapping varies considerably across the Site. The deepest soil deposits are indicated to be in the southwestern portion of the Parcel B. Bedrock is indicated to be relatively shallow in a central portion of the west side of the Parcel B, becoming deeper again to the northeast. Parcel A is indicated to have relatively shallow bedrock. Relevant borehole logs by others are attached for reference.

Shallow groundwater in the vicinity of the site varies significantly due to the elevation differences across the Site.

Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, K2H 5B7, Canada T: +1 613 592 9600 F: +1 613 592 9601

GENERAL REQUIREMENTS

- A Record of Site Condition is not anticipated to be required; however, standard operating procedures (SOPs) should be followed.
- Complete a Daily Log for every day of field work. Use standard field forms.
- Initial calibration of field equipment should be performed at the start of each field day, with a daily check of calibration using a standard of known concentration.
- Clean disposable Nitrile™ gloves will be used at each sampling location to prevent cross-contamination.
- All non-dedicated sampling equipment (e.g., water level meters, split spoons) will be decontaminated between sampling locations. Sampling equipment in contact with soil, groundwater, or sediment will be: cleaned with a brush; washed with a laboratory-grade detergent solution (e.g., phosphate-free LiquiNox or AlcoNox) and thoroughly rinsed with analyte-free water.

BOREHOLE DRILLING, WELL INSTALLATION AND WELL DEVELOPMENT

- **** Confirm that every drilling location has been cleared by the private locator. ****
- A detailed description of the drilling scope and well construction details is provided in the driller work order.
- Screen soil samples at 2-foot intervals (1 split spoon per 2 feet) using an RKI eagle calibrated to hexane and isobutylene.
- At each drilling location collect samples at 2 foot intervals for the parameters listed in Table 1 below.
- For well installation, see detailed instructions in driller work order: 2-inch inner diameter (ID) Schedule 40 polyvinyl chloride (PVC) casing and 2-inch ID Schedule 40 PVC well screens (1.5 metres in length, #10 slot size); sand pack surrounding each screen will be #00N; each monitoring well will be completed at ground surface with a flush-mount protective casing set in concrete and sealed with a PVC j-plug.
- Mark the reference point at the top of well pipe with a small notch. Install waterra tubing and footvalve in each new monitoring well.
- Monitoring well construction details are provided in Table 2.

MONITORING WELL DEVELOPMENT

- Develop each MW in accordance with our SOP.

GROUNDWATER MONITORING

Before measuring the water levels, open the J-plugs to allow air in the casing to vent and the water level to stabilize.

Table 1 Borehole and soil sampling plan

Borehole ID	APEC	COCs	Well Installed (Y/N)	Depth (mbgs)	Soil Samples	Duplicate Samples
21-01	APEC 1 and APEC 3	PHCs, BTEX, VOCs, PAHs, Metals, and Inorganics	Y shallow and deep	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, VOCs, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	Duplicate Samples
21-02	APEC 1 and APEC 3	PHCs, BTEX, VOCs, PAHs, Metals, and Inorganics	Y	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, VOCs, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-03	APEC 1 and APEC 3	PHCs, BTEX, VOCs, PAHs, Metals, and Inorganics	Y	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, VOCs, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-04	APEC 2 and APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	Y for Hydro G	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	Duplicate Samples
21-05	APEC 2 and APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-06	APEC 2 and APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	Y	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-07	APEC 2 and APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	Duplicate Samples

Borehole ID	APEC	COCs	Well Installed (Y/N)	Depth (mbgs)	Soil Samples	Duplicate Samples
21-08	APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-09	APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-10	APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	Y	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	Duplicate Samples
21-11	APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-12	APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	
21-13	APEC 3	PHCs, BTEX, PAHs, Metals, and Inorganics	N	Env sampling to deeper of 5' below fill or 5' below water table or bedrock interface	PHCs, BTEX, PAHs, Metals, Cr(VI), Hg, B-HWS, EC, and SAR in fill. Collect samples from first 5' of native.	Duplicate samples

*Locations provided on Figure 1
PHCs – Petroleum Hydrocarbon Fractions F1-F4
PAHs – Polycyclic Aromatic Hydrocarbons
VOCs – Volatile Organic Compounds
SAR – Sodium Absorption Ratio
BTEX – Benzene, toluene, ethylbenzene, xylene
B-HWS – Hot water soluble boron
EC – Electrical Conductivity

Table 2 Monitoring well construction.

Borehole ID	Depth of screen base (m bgs)	Screen length (m)	Well diameter (cm)	Protective Casing Type
21-01	Confirm Installation details with Laura and Caitlin	3	5	Flush mount
21-02	Confirm Installation details with Laura and Caitlin	3	5	Stick-up
21-03	Confirm Installation details with Laura and Caitlin	3	5	Stick-up
21-04	Confirm Installation details with Laura and Caitlin	3	5	Stick-up
21-06	Confirm Installation details with Laura and Caitlin	3	5	Stick-up
21-10	Confirm Installation details with Laura and Caitlin	3	5	Stick-up

- Collect a round of water level measurements using the water level meter. Use the “Static Water Level Field Form”.
- Collect groundwater samples from monitoring wells following SOP10 (Low Flow Sample Collection) using a peristaltic pump for the parameters in Table 3. Allow the water level to stabilize in the monitoring well before starting measurement of field parameters.
- If drawdown in the well exceeds 0.3 metres during purging, then complete purging in accordance with the SOP9 procedure for low-yield monitoring wells.
- The multi-parameter meter should be initially calibrated the equipment supplier and thereafter at the start of each day. Check calibration to known pH, conductivity, ORP and DO concentration at mid-day. If equipment is out of calibration (i.e., reading is off by more than 10%), call Laura.
- If field parameters do not stabilize during low flow purging, do not purge longer than 30 minutes before collecting a groundwater sample.
- Samples are to be collected from all the locations listed in Table 3. Samples for metals, As, Se, Sb, CrVI and Hg filtered in the field with inline filter.
- Samples do not need to be submitted day of sampling provided you keep them on ice during the day and/or refrigerate them overnight (i.e., keep them cold from collection to submission).
- Collect quality assurance samples as indicated in Tables 1 and 3. The duplicate groundwater samples should be labelled in a manner in which the laboratory cannot readily identify the sample as a duplicate.
- Please call Laura if you see or suspect that there is product in any monitoring well.
- Use the “Groundwater Sample Collection” form to collect all data during groundwater sampling.

Table 3 Groundwater sampling plan

Borehole ID	Field Parameter Measurements	Groundwater Analyses to be Requested	QA/QC samples
BH21-01, BH21-02, BH21-03, BH21-04, BH21-06, BH21-10, MW17-1, MW17-2	pH; EC; temp; DO; ORP	PHCs, BTEX, VOCs, PAHs, Metals, Cr(VI), Hg, Na, Cl, As, Se, Sb	Collect one duplicate sample. Trip blank during 1 sampling event.

CHAIN-OF-CUSTODY

Chain-of-Custody Item	Information
Analytical Laboratory	AGAT
Generic Site Condition Standards	Table 7 Commercial, coarse textured soil
Use Record of Site Condition analytical procedures?	Yes
Turn-around Time	Regular
Golder Reporting Contact	Laura_Jones@golder.com, Environmental Lead Gal_Equis@golder.com
Project-Specific Quote Number (if applicable)	None
Golder Billing Contact	Laura Jones Ljjones@golder.com
Is an EQuiS EDD Required?	Yes – Facility ID - 229413340

MANAGEMENT OF INVESTIGATION DERIVED WASTE

- Keep waste soil and water segregated into separate drums
- Label drums for waste management purposes, include Golder Associates, project number, date and drum contents (soil, purge water)
- Leave drums in an easily accessible location by vehicle)
- Record inventory of waste containers on Daily Log

SPECIAL INSTRUCTIONS

- Check in with Laura and Caitlin prior to well installation as indicated.

GOLDER ASSOCIATES LTD.

Laura Jones, MASc, PEng
Senior Environmental Engineer

Keith Holmes, MSc, PGeo
Associate

LR/LJ/

Attachments: Figure 1

https://golderassociates.sharepoint.com/sites/140130/project files/6 deliverables/02 - environmental/02- parkade - sap2/app a - sap/21451149-m02 sap 2 parkade.docx

APPENDIX B

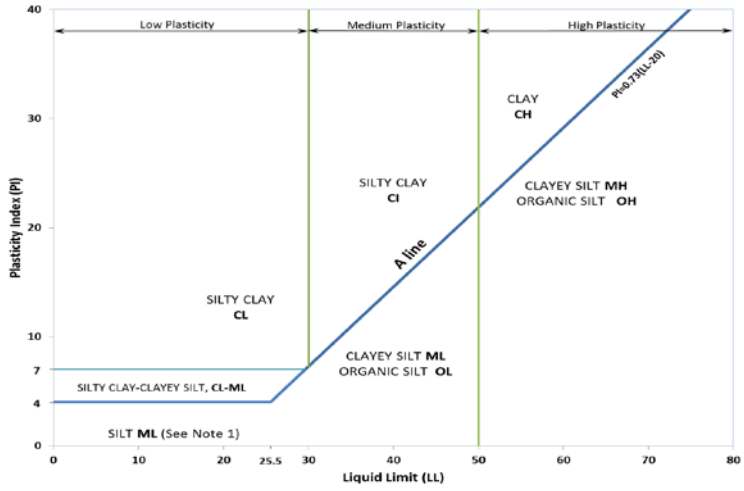
Record of Borehole Logs

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.

LIST OF SYMBOLS

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: 21451149

RECORD OF BOREHOLE: 21-01

SHEET 1 OF 1

LOCATION: N 5028807.8 ;E 366831.0

BORING DATE: June 11, 2021

DATUM: NAD 1983

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		65.05									
0	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.05									Flush Mount Casing
		FILL - (SW/GW) gravelly SAND to sandy GRAVEL, angular; grey (PAVEMENT STRUCTURE)		64.44	1	SS	14		ND				Backfill; Bentonite Seal
		FILL - (SW) gravelly SILTY SAND; dark brown to brown; non-cohesive, moist to wet, compact		0.61				⊕					Silica Sand
1				63.85	2	SS	18		□		105 ⊕		52 mm Diam. PVC #10 Slot Screen
		FILL - Wood; brown; non-cohesive, moist		1.20									
				1.30									
		FILL/WASTE - (SM) gravelly SILTY SAND; dark brown to black, contains asphalt; non-cohesive, moist, compact		1.45									
				63.37	3	SS	>50		⊕				Cave
				1.68									
		FILL - (SM) gravelly SILTY SAND; brown, with black staining; non-cohesive, moist to wet, compact		63.14									
2				1.91									
		FILL - (GW) sandy GRAVEL; grey; non-cohesive, moist, very dense											
		End of Borehole Auger Refusal											
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-02

SHEET 1 OF 2

LOCATION: N 5028720.9 ;E 366811.1

BORING DATE: May 18, 2021

DATUM: NAD 1983

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		65.67						
0	Power Auger 200 mm Diam. (Holow Stem)	TOPSOIL - (SM) SILTY SAND; dark brown, contains organic matter (rootlets); non-cohesive, moist loose		0.00						
		FILL - (SM) gravelly SILTY SAND; dark brown, contains brick, ash, organic matter and silty clay layers; non-cohesive, moist, loose to compact		0.15	1	SS	9	⊕ ND	○	M
1					2	SS	>50	□ ⊕ ND		
				64.40						Bentontie Seal
		Borehole continued on RECORD OF DRILLHOLE 21-02		1.27						
2										
3										
4										
5										
6										
7										
8										
9										
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-02

SHEET 2 OF 2

LOCATION: N 5028720.9 ;E 366811.1

DRILLING DATE: May 18, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		64.40															
2	Rotary Drill / NQ Core	Fresh, thinly to medium bedded, grey to dark grey, fine to medium grained, non-porous, medium strong SHALEY NODULAR LIMESTONE - Broken core from 1.44 m to 1.55 m		1.27	1	100													Bentontie Seal Silica Sand UCS = 130 MPa
3					2	100													32 mm Diam. PVC #10 Slot Screen
5					3	100													
6																			Silica Sand
7				58.38	4	100													
		End of Drillhole Note(s): 1. Water level in screen measured at 2.09 m (Elev. 63.59 m) on May 28, 2021		7.29															

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED: KM

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-03

SHEET 1 OF 2

LOCATION: N 5028765.9 ;E 366781.2

BORING DATE: May 18, 2021

DATUM: NAD 1983

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		64.97									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM) SILTY SAND, trace gravel; dark brown, contains organic matter (rootlets); non-cohesive, moist, loose		0.00 64.72	1	SS	5	ND	⊕				
				0.25									
1		FILL - (SM) SILTY SAND, trace gravel; dark brown to grey brown, contains organic matter and brick fragments; non-cohesive, moist, compact			2	SS	10	ND	⊕				Bentontie Seal
				63.45									
		(SM) gravelly SILTY SAND; grey brown (GLACIAL TILL); non-cohesive, moist, compact		1.52	3	SS	>50	ND	⊕				
				1.68									
2		Borehole continued on RECORD OF DRILLHOLE 21-03											
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-03

SHEET 2 OF 2

LOCATION: N 5028765.9 ;E 366781.2

DRILLING DATE: May 18, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		63.29															
2	Rotary Drill / NQ Core	Fresh, thinly to medium bedded, grey to dark grey, fine to medium grained, non-porous, medium strong SHALEY NODULAR LIMESTONE - Broken core from 2.05 m to 2.07 m		1.68	1	100													Bentontie Seal UCS = 130 MPa Silica Sand
3					2	100													
		- Broken core from 3.57 m to 3.58 m																	32 mm Diam. PVC #10 Slot Screen
4					3	100													
5		- Broken core from 4.64 m to 4.66 m		59.66															
		End of Drillhole		5.31															
6		Note(s): 1. Water level in screen measured at 2.59 m (Elev. 62.38 m) on May 28, 2021 2. Water level in screen measured at 2.67 m (Elev. 62.30 m) on June 23, 2021																	
7																			
8																			
9																			
10																			
11																			

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED: KM

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-04

SHEET 1 OF 1

LOCATION: N 5028747.0 ;E 366692.9

BORING DATE: May 13, 2021

DATUM: NAD 1983

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	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		67.61									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (ML) sandy SILT; dark brown, contains organic matter (rootlets); non-cohesive, moist, very loose		0.00									
				67.31	1	SS	5	⊕ ND	□				
		FILL - (CL/CI) SILTY CLAY, trace to some sand, trace gravel; grey brown, contains concrete fragments and organic matter; cohesive, w>PL, firm		0.30									
1					2	SS	6	⊕ ND	□		○		
					3	SS	5	⊕ ND	□				
2				65.32									
		FILL - (SM/ SP/GP) SILTY GRAVEL and SAND; dark brown, contains concrete, brick and wood fragments; non-cohesive, moist to wet, compact to very loose		2.29	4	SS	18	⊕ ND	□		○	M	
3					5	SS	1	⊕	□				
				63.80	6	SS	>50	⊕	□				
		End of Borehole Auger Refusal		3.81									
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-05

SHEET 1 OF 2

LOCATION: N 5028738.6 ;E 366737.3

BORING DATE: May 14, 2021

DATUM: NAD 1983

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		65.58						
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (ML/SM) SILTY SAND to sandy SILT, trace gravel; dark brown, contains brick fragments and organic matter (rootlets); non-cohesive, moist, loose		0.00 65.35 0.23	1	SS	12	⊕ □		
1		FILL - (SM/SP) gravelly SILTY SAND, some low-plastisity fines; dark brown, contains concrete, carpet and organic matter (rootlets); non-cohesive, moist, compact to loose		64.34	2	SS	>55	□ ⊕	○	MH
	Rotary Drill NQ Core	CONCRETE		1.24 63.79	1	RC	DD			
2		FILL - (SM) gravelly SILTY SAND; brown; non-cohesive, moist to wet		1.79 1.95						
		Borehole continued on RECORD OF DRILLHOLE 21-05								

Bentonite Seal

Bentonite Seal

3 4 5 6 7 8 9 10

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-05

SHEET 2 OF 2

LOCATION: N 5028738.6 ;E 366737.3

DRILLING DATE: May 14, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		63.63															
2	Rotary Drill / NQ Core	Fresh, thinly to medium bedded, grey to dark brey, fine to medium grained, non-porous, mediuum strong SHALEY NODULAR LIMESTONE		1.95															UCS = 97 MPa
3					2	0													Bentonite Seal
4					3	0-25													Silica Sand
5																			
6					4	0-25													38 mm Diam. PVC #10 Slot Screen
7				58.64															
		End of Drillhole		6.94															
8		Note(s):																	
9		1. Water level in screen measured at 2.72 m (Elev. 62.86 m) on May 28, 2021																	
10		2. Water level in screen measured at 2.73 m (Elev. 62.85 m) on June 2, 2021																	
11																			

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-06

SHEET 1 OF 2

LOCATION: N 5028643.3 ;E 366748.4

BORING DATE: May 12, 2021

DATUM: NAD 1983

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		67.00									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (ML) sandy SILT, trace gravel; dark brown, contains organic matter (rootlets); non-cohesive, moist, loose		0.00									
				0.15	1	SS	11	⊕ ND	□				Bentonite Seal
		FILL - (ML/SM) SILTY SAND to sandy SILT, some low-medium plasticity fines, trace gravel; brown to dark brown, with black staining, contains wood, organic matter (rootlets); non-cohesive, moist, compact											
1					2	SS	14	⊕	□				Backfill
					3	SS	15	⊕ ND				MH	Bentonite Seal
2				64.97									
		Borehole continued on RECORD OF DRILLHOLE 21-06		2.03									
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-06

SHEET 2 OF 2

LOCATION: N 5028643.3 ;E 366748.4

DRILLING DATE: May 12, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		64.97															
3	Rotary Drill / NQ Core	Fresh, thinly to medium bedded, grey to dark grey, fine to medium grained, non-porous, medium strong SHALEY NODULAR LIMESTONE		2.03	1	100													Bentonite Seal UCS = 109 MPa Silica Sand
					2	100													
4		- Broken core from 4.03 m to 4.04 m			3	100													38 mm Diam. PVC #10 Slot Screen
5				61.60															
		End of Drillhole Note(s): 1. Water level in screen measured at 1.19 m (Elev. 65.82 m) on May 27, 2021 2. Water level in screen measured at 2.70 m (Elev. 64.31 m) on June 23, 2021		5.40															
6																			
7																			
8																			
9																			
10																			
11																			
12																			

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-07

SHEET 1 OF 2

LOCATION: N 5028686.9 ;E 366770.2

BORING DATE: May 17, 2021

DATUM: NAD 1983

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		66.70						
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM/ML) SILTY SAND to sandy SILT, trace gravel, trace clay; dark brown, contains organic matter (rootlets); non-cohesive, moist, loose		0.00 66.47						
				0.23	1	SS	8	⊕ □	○	Bentonite Seal
1		FILL - (SM) SILTY SAND, trace gravel, trace to some clay; dark brown to brown, contains ashr, organic matter, brick fragments, concrete fragments, silty clay layers and wood; non-cohesive, moist, loose to compact			2	SS	19	□ ⊕ ND	○	
					3	SS	>50	□ ⊕	○	64 mm Diam. VSP Pipe
2										
				64.16	4	SS	>50	□ ⊕ ND	○	
		Borehole continued on RECORD OF DRILLHOLE 21-07		2.54						
3										
4										
5										
6										
7										
8										
9										
10										

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-07

SHEET 2 OF 2

LOCATION: N 5028686.9 ;E 366770.2

DRILLING DATE: May 17, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		64.16															
3	Rotary Drill NQ Core	Fresh, thinly to medium bedded, grey to dark grey, fine to medium grained, non-porous, medium strong SHALEY NODULAR LIMESTONE - Lost core from 2.54 m to 2.64 m - Broken core from 3.08 m to 3.10 m		2.54	1	100													
4					2	100													UCS = 95 MPa
5					3	100													UCS = 106 MPa
6		- Broken core from 6.21 m to 6.23 m																	
7					4	100													64 mm Diam. VSP Pipe
8					5	100													
9																			
10					6	100													
				55.79															
11		End of Borehole		10.91															
12																			

DEPTH SCALE
1 : 50

GOLDER

LOGGED: RI
CHECKED: KM

PROJECT: 21451149

RECORD OF BOREHOLE: 21-08

SHEET 1 OF 1

LOCATION: N 5028762.3 ;E 366650.3

BORING DATE: May 18, 2021

DATUM: NAD 1983

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		66.02						
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM) gravelly SILTY SAND; brown, contains organics; cohesive, moist, dense		0.00						
		FILL - (SM) gravelly SILTY SAND, trace organics andgravel; brown, contains brick fragments; cohesive, moist, dense to very dense		0.15	1	SS	30	□ ⊕	○	
1					2	SS	>50	□ ⊕	○	
				64.80						
		End of Borehole Auger Refusal		1.22						
2										
3										
4										
5										
6										
7										
8										
9										
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKP

CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-09

SHEET 1 OF 2

LOCATION: N 5028717.0 ;E 366649.1

BORING DATE: May 18, 2021

DATUM: NAD 1983

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		66.35									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM) gravelly SILTY SAND; brown, contains organics; non-cohesive, moist, loose		0.00									
				0.15	1	SS	10	⊕	□ ND				
		FILL - (SM) gravelly SILTY SAND; dark brown to brown, trace organics; non-cohesive, moist, loose to dense											
1					2	SS	41	⊕	□ ND		○	M	
				64.78	3	SS	>50		□ ⊕				
		Borehole continued on RECORD OF DRILLHOLE 21-09		1.57									
2													
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKP
CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-09

SHEET 2 OF 2

LOCATION: N 5028717.0 ;E 366649.1

DRILLING DATE: May 18, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		64.78														
2	Rortary Drill / BW Casing	Fresh, thinly bedded, medium to dark brownish grey, fine grained, non-porous, medium strong to weak SHALEY NODULAR LIMESTONE - veritcal join from 2.04 to 2.09 m depth - vertical joint from 2.38 to 2.43 m depth		1.57	1							BD,, BD,, BD,, BD,, BD,, BD,,						
3				63.23														
		End of Drillhole		3.12														
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKP
CHECKED: KM

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-10

SHEET 1 OF 2

LOCATION: N 5028684.9 ;E 366642.2

BORING DATE: May 18, 2021

DATUM: NAD 1983

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		66.19						
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM) gravelly SILTY SAND; brown, contains organics; non-cohesive, moist, loose		0.00						
		FILL - (SM) gravelly SILTY SAND; dark brown to brown, contains organics, brick fragments and clay pockets; non-cohesive, moist, loose to compact		0.15	1	SS	10	□ ⊕ ND		
1					2	SS	15	□ ⊕ ND		Bentonite Seal
					3	SS	>50	□ ⊕ ND		
2				64.01						
		Borehole continued on RECORD OF DRILLHOLE 21-10		2.18						
3										
4										
5										
6										
7										
8										
9										
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKP

CHECKED: KM

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-10

SHEET 2 OF 2

LOCATION: N 5028684.9 ;E 366642.2

DRILLING DATE: May 18, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		64.01															
3	Rotary Drill / NQ Core	Fresh, thinly to medium bedded, medium grey to brownish grey, fine to medium grained, non-porous, medium strong to weak SHALEY LIMESTONE -broken core from 2.38 to 2.45 m depth - vertical joint from 2.69 to 4.06 m		2.18	1		80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90	BD,, BD,, BD,, BD,,				10^{-6} 10^{-5} 10^{-4} 10^{-3}	2 4 6		
4												BD,,							
5		- broken core from 5.1 to 5.22 m depth			2							BD,, BD,,							
				60.70															
		End of Drillhole		5.49															
6		Note(s): 1. Water level in screen measured at 2.66 m (Elev. 63.53 m) on May 28, 2021 2. Water level in screen measured at 2.66 m (Elev. 63.53 m) on June 23, 2021																	
7																			
8																			
9																			
10																			
11																			
12																			

Bentonite Seal

Silica Sand

38 mm Diam. PVC #10 Slot Screen

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKP

CHECKED: KM

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-11

SHEET 1 OF 1

LOCATION: N 5028623.7 ;E 366685.5

BORING DATE: May 13, 2021

DATUM: NAD 1983

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		67.35						
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM) SILTY SAND, some clay; dark brown, contains organic matter (rootlets); non-cohesive, moist, very loose		0.00	1	SS	3	□ ND ⊕		
				67.05						
		FILL - (SM) gravelly SILTY SAND, trace to some clay; dark brown, contains organic matter; non-cohesive, moist to wet, very loose to compact		0.30						
1					2	SS	11	□ ND ⊕		
					3	SS	>50	□	⊕ 230	
				65.67						
		End of Borehole Auger Refusal		1.68						
2										
3										
4										
5										
6										
7										
8										
9										
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED:

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-12

SHEET 1 OF 2

LOCATION: N 5028586.9 ;E 366762.5

BORING DATE: May 19, 2021

DATUM: NAD 1983

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		68.72									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (SM) gravelly SILTY SAND; brown, contains organics; non-cohesive, moist, dense		0.00									
				0.15	1	SS	26	ND ⊕	□				
1		FILL - (SM) gravellly SILTY SAND; dark brown to brown with black mottling; non-cohesive, moist, compact to dense			2	SS	20	ND ⊕	□				
				67.32									
		Borehole continued on RECORD OF DRILLHOLE 21-12		1.4									
2													
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKP

CHECKED:

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-12

SHEET 2 OF 2

LOCATION: N 5028586.9 ;E 366762.5

DRILLING DATE: May 19, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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		67.32														
2	Rotary Drill / NQ Core	Fresh, thinly bedded, medium to dark brownish grey, fine grained, non-porous, medium strong to weak SHALEY NODULAR LIMESTONE - broken core from 1.61 to 1.70 m depth - broken core from 2.15 to 2.19 m depth		1.40								BD,, BD,, BD,, BD,, BD,, BD,,						
3		End of Drillhole		65.75 2.97														
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKP

CHECKED:

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

PROJECT: 21451149

RECORD OF BOREHOLE: 21-13

SHEET 1 OF 2

LOCATION: N ;E

BORING DATE: May 13, 2021

DATUM: NAD 1983

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									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL - (ML) sandy SILT, trace clay; dark brown, contains organic matter (rootlets); non-cohesive, moist, very loose		0.00							
		FILL - (CL/CI) SILTY CLAY, trace sand, trace gravel; grey brown, contains organic matter; cohesive, w~PL, firm		0.23	1	SS	6	⊕ ND; □			
1		(SM/ML) SILTY SAND to sandy SILT, some gravel to gravelly; grey (GLACIAL TILL); non-cohesive, moist to wet, compact		0.76	2	SS	23	⊕ ND		M	
2					3	SS	10	□	⊕ 160		
3		Borehole continued on RECORD OF DRILLHOLE 21-13		2.97							
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED:

MIS-BHS 001 21451149.GPJ GAL-MIS.GDT 7/23/21

PROJECT: 21451149

RECORD OF DRILLHOLE: 21-13

SHEET 2 OF 2

LOCATION: N ;E

DRILLING DATE: May 13, 2021

DATUM: NAD 1983

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

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																
3	Rotary Drill / NQ Core	Slightly weathered to fresh, thinly to medium bedded, medium grey to brownish grey, fine to medium grained, non-porous, medium strong to weak SHALEY LIMESTONE - broken core from 2.97 to 3.05 m depth - vertical joint from 2.97 to 3.27 m depth		2.97							30	BD,, BD,, BD,, JN,,						
4		- lost core from 3.88 to 4.30 m depth			1						30	BD,, BD,,						
											30	BD,,						
											30	BD,, Si Sa BD,, Si Sa BD,, Si Sa/Sa Si BD,, Si Sa/Sa Si						
5											30	JN,, BD,,						
		End of Drillhole		4.98														
6																		
7																		
8																		
9																		
10																		
11																		
12																		

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED:

MIS-RCK 004 21451149.GPJ GAL-MISS.GDT 7/23/21

APPENDIX C

Certificates of Analysis

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Laura Jones

PROJECT: 21451149

AGAT WORK ORDER: 21Z750737

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Jun 01, 2021

PAGES (INCLUDING COVER): 20

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - All Metals (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

SAMPLE DESCRIPTION:				BH21-02 SA2	BH21-03 SA2	BH21-03 SA22	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-11 SA1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-13
Parameter	Unit	G / S	RDL	2501962	2501964	2501965	2501970	2501971	2501972	2501974	2501975
Antimony	µg/g	40	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	6	6	5	2	3	2	2	2
Barium	µg/g	670	2.0	131	339	207	320	175	157	74.0	102
Beryllium	µg/g	8	0.4	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Boron	µg/g	120	5	9	10	8	<5	<5	<5	<5	6
Boron (Hot Water Soluble)	µg/g	2	0.10	0.25	0.22	0.19	0.38	0.23	0.27	<0.10	0.24
Cadmium	µg/g	1.9	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	160	5	21	31	32	108	51	37	25	27
Cobalt	µg/g	80	0.5	6.7	12.8	10.5	21.2	12.0	9.6	6.2	8.2
Copper	µg/g	230	1.0	10.1	12.0	10.5	46.6	25.3	21.4	9.3	14.5
Lead	µg/g	120	1	59	75	42	37	18	24	9	18
Molybdenum	µg/g	40	0.5	1.3	1.4	0.7	0.7	0.9	0.8	0.5	<0.5
Nickel	µg/g	270	1	12	18	16	56	29	22	13	15
Selenium	µg/g	5.5	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Silver	µg/g	40	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	µg/g	3.3	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Uranium	µg/g	33	0.50	0.94	0.70	0.63	1.09	0.79	0.85	0.67	0.67
Vanadium	µg/g	86	0.4	28.2	47.2	47.7	104	56.5	46.0	30.9	42.2
Zinc	µg/g	340	5	60	45	41	128	84	68	34	67
Chromium, Hexavalent	µg/g	8	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury	µg/g	3.9	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - All Metals (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

		SAMPLE DESCRIPTION:		BH21-13 SA3
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-05-13
Parameter	Unit	G / S	RDL	2501976
Antimony	µg/g	40	0.8	<0.8
Arsenic	µg/g	18	1	<1
Barium	µg/g	670	2.0	65.6
Beryllium	µg/g	8	0.4	<0.4
Boron	µg/g	120	5	5
Boron (Hot Water Soluble)	µg/g	2	0.10	<0.10
Cadmium	µg/g	1.9	0.5	<0.5
Chromium	µg/g	160	5	17
Cobalt	µg/g	80	0.5	5.7
Copper	µg/g	230	1.0	11.7
Lead	µg/g	120	1	4
Molybdenum	µg/g	40	0.5	<0.5
Nickel	µg/g	270	1	9
Selenium	µg/g	5.5	0.8	<0.8
Silver	µg/g	40	0.5	<0.5
Thallium	µg/g	3.3	0.5	<0.5
Uranium	µg/g	33	0.50	0.59
Vanadium	µg/g	86	0.4	26.6
Zinc	µg/g	340	5	23
Chromium, Hexavalent	µg/g	8	0.2	<0.2
Mercury	µg/g	3.9	0.10	<0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
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TEL (905)712-5100
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Certificate of Analysis

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: BH21-02 SA2	BH21-03 SA2	BH21-03 SA22	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-11 SA1
				SAMPLE TYPE: Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED: 2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-13
				2501962	2501964	2501965	2501970	2501971	2501972	2501974	2501975
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	0.320	0.398	0.373	0.242	0.289	0.347	0.201	0.203
Sodium Adsorption Ratio (2:1) (Calc.)	N/A	12	N/A	0.718	2.34	2.43	0.349	0.182	0.163	0.130	0.329

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: BH21-13 SA3
				SAMPLE TYPE: Soil
				DATE SAMPLED: 2021-05-13
				2501976
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	0.261
Sodium Adsorption Ratio (2:1) (Calc.)	N/A	12	N/A	0.269

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501962-2501976 EC was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). SAR is a calculated parameter.

Analysis perfomed at AGAT Toronto (unless marked by *)

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

SAMPLE DESCRIPTION:				BH21-02 SA2	BH21-03 SA2	BH21-03 SA22	BH21-03 SA3	BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13	2021-05-14	2021-05-14	2021-05-17
Parameter	Unit	G / S	RDL	2501962	2501964	2501965	2501966	2501970	2501971	2501972	2501974
Naphthalene	µg/g	9.6	0.05	0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08
Acenaphthene	µg/g	96	0.05	0.48	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	0.47	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	4.85	<0.05	<0.05	<0.05	0.12	0.05	<0.05	0.19
Anthracene	µg/g	0.67	0.05	0.84	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10
Fluoranthene	µg/g	9.6	0.05	6.27	0.05	<0.05	<0.05	0.27	0.14	<0.05	0.51
Pyrene	µg/g	96	0.05	4.80	<0.05	<0.05	<0.05	0.23	0.12	<0.05	0.44
Benz(a)anthracene	µg/g	0.96	0.05	2.61	<0.05	<0.05	<0.05	0.12	0.06	<0.05	0.28
Chrysene	µg/g	9.6	0.05	2.15	<0.05	<0.05	<0.05	0.14	0.07	<0.05	0.29
Benzo(b)fluoranthene	µg/g	0.96	0.05	2.39	<0.05	<0.05	<0.05	0.20	0.15	<0.05	0.40
Benzo(k)fluoranthene	µg/g	0.96	0.05	0.98	<0.05	<0.05	<0.05	0.17	0.13	<0.05	0.19
Benzo(a)pyrene	µg/g	0.3	0.05	1.86	<0.05	<0.05	<0.05	0.10	0.09	<0.05	0.38
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	0.76	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.18
Dibenz(a,h)anthracene	µg/g	0.1	0.05	0.26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	0.68	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.17
1 and 2 Methlynaphthalene	µg/g	76	0.05	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	11.2	19.1	6.9	8.4	25.9	15.2	8.9	13.3
Surrogate	Unit	Acceptable Limits									
Naphthalene-d8	%	50-140		68	65	68	65	64	61	61	76
Acenaphthene-d10	%	50-140		64	77	79	76	74	69	71	68
Chrysene-d12	%	50-140		60	70	80	78	71	67	70	61

Certified By: NPopowkolof

AGAT Laboratories

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FAX (905)712-5122
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Certificate of Analysis

AGAT WORK ORDER: 21Z750737
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

		SAMPLE DESCRIPTION:		BH21-11 SA1	BH21-13 SA3	BH21-07 SA3
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2021-05-13	2021-05-13	2021-05-17
Parameter	Unit	G / S	RDL	2501975	2501976	2501977
Naphthalene	µg/g	9.6	0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	96	0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	<0.05	<0.05	0.12
Anthracene	µg/g	0.67	0.05	<0.05	<0.05	0.05
Fluoranthene	µg/g	9.6	0.05	0.06	<0.05	0.24
Pyrene	µg/g	96	0.05	<0.05	<0.05	0.19
Benz(a)anthracene	µg/g	0.96	0.05	<0.05	<0.05	0.09
Chrysene	µg/g	9.6	0.05	<0.05	<0.05	0.09
Benzo(b)fluoranthene	µg/g	0.96	0.05	<0.05	<0.05	0.09
Benzo(k)fluoranthene	µg/g	0.96	0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	<0.05	<0.05	0.09
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	<0.05	<0.05	<0.05
1 and 2 Methlynaphthalene	µg/g	76	0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	23.7	10.1	5.8
Surrogate	Unit	Acceptable Limits				
Naphthalene-d8	%	50-140		74	87	89
Acenaphthene-d10	%	50-140		69	71	75
Chrysene-d12	%	50-140		76	68	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501962-2501977 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: NPopowich

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)

DATE RECEIVED: 2021-05-21 DATE REPORTED: 2021-06-01

				SAMPLE DESCRIPTION:	BH21-02 SA2	BH21-03 SA2	BH21-03 SA22	BH21-03 SA3	BH21-13 SA3
				SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED:	2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13
Parameter	Unit	G / S	RDL		2501962	2501964	2501965	2501966	2501976
F1 (C6 - C10)	µg/g		5		<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5		<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	230	10		<10	<10	<10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10		<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	1700	50		57	<50	<50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50		<50	<50	<50	<50	<50
F4 (C34 to C50)	µg/g	3300	50		<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50		NA	NA	NA	NA	NA
Moisture Content	%		0.1		11.2	19.1	6.9	8.4	10.1
Surrogate	Unit	Acceptable Limits							
Toluene-d8	% Recovery	50-140			82	81	78	87	85
Terphenyl	%	60-140			100	108	78	81	86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501962-2501976 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: NPopowkolof

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

		SAMPLE DESCRIPTION:		BH21-04 SA3	BH21-05 SA1	BH21-06 SA2	BH21-07 SA2	BH21-11 SA1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2021-05-13	2021-05-14	2021-05-14	2021-05-17	2021-05-13
Parameter	Unit	G / S	RDL	2501970	2501971	2501972	2501974	2501975
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	68	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m & p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 - C10)	µg/g		5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	230	10	<10	<10	<10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	1700	50	<50	<50	<50	54	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50	<50	<50	51	<50
F4 (C34 to C50)	µg/g	3300	50	<50	<50	<50	86	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA	NA	NA	NA	NA
Moisture Content	%		0.1	25.9	15.2	8.9	13.3	23.7
Surrogate	Unit	Acceptable Limits						
Toluene-d8	% Recovery	60-140		82	80	78	88	78
Terphenyl	%	60-140		112	103	107	73	95

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501970-2501975 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popowich

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AGAT WORK ORDER: 21Z750737
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

SAMPLE DESCRIPTION:				BH21-02 SA2	BH21-03 SA2	BH21-03 SA22	BH21-03 SA3	BH21-13 SA3
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13
Parameter	Unit	G / S	RDL	2501962	2501964	2501965	2501966	2501976
Dichlorodifluoromethane	µg/g	16	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.032	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Bromomethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	ug/g	4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	ug/g	16	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	ug/g	0.064	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	ug/g	1.6	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl Ether	ug/g	11	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	ug/g	17	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methyl Ethyl Ketone	ug/g	70	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g	55	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chloroform	ug/g	0.47	0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichloroethane	ug/g	0.05	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,1,1-Trichloroethane	ug/g	6.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.21	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzene	ug/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	ug/g	0.16	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichloroethylene	ug/g	0.91	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Bromodichloromethane	ug/g	18	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Isobutyl Ketone	ug/g	31	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	ug/g	0.05	0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Toluene	ug/g	68	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	ug/g	13	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	ug/g	0.05	0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Tetrachloroethylene	ug/g	4.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Chlorobenzene	ug/g	2.4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	ug/g	9.5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m & p-Xylene	ug/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Certified By: NPopowich

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Certificate of Analysis

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-01

SAMPLE DESCRIPTION:				BH21-02 SA2	BH21-03 SA2	BH21-03 SA22	BH21-03 SA3	BH21-13 SA3
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2021-05-18	2021-05-18	2021-05-18	2021-05-18	2021-05-13
Parameter	Unit	G / S	RDL	2501962	2501964	2501965	2501966	2501976
Bromoform	ug/g	0.61	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	ug/g	34	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	ug/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g	9.6	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/g	0.2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/g	6.8	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	ug/g	26	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene (Cis + Trans)	µg/g	0.18	0.04	<0.04	<0.04	<0.04	<0.04	<0.04
n-Hexane	µg/g	46	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	11.2	19.1	6.9	8.4	10.1
Surrogate	Unit	Acceptable Limits						
Toluene-d8	% Recovery	50-140		88	87	89	87	86
4-Bromofluorobenzene	% Recovery	50-140		89	92	90	89	89

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501962-2501976 The sample was analyzed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: NPopowkolof

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Exceedance Summary

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Anthracene	µg/g	0.67	0.84
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benz(a)anthracene	µg/g	0.96	2.61
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(a)pyrene	µg/g	0.3	1.86
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(b)fluoranthene	µg/g	0.96	2.39
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(k)fluoranthene	µg/g	0.96	0.98
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Dibenz(a,h)anthracene	µg/g	0.1	0.26
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)	Benzo(a)anthracene	µg/g	0.96	2.61
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)	Benzo(a)pyrene	µg/g	0.3	1.86
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)	Benzo(b)fluoranthene	µg/g	0.96	2.39
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)	Benzo(k)fluoranthene	µg/g	0.96	0.98
2501962	BH21-02 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)	Dibenzo(a,h)anthracene	µg/g	0.1	0.26
2501970	BH21-04 SA3	ON T7 S ICC CT	O. Reg. 153(511) - All Metals (Soil)	Vanadium	µg/g	86	104
2501974	BH21-07 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(a)pyrene	µg/g	0.3	0.38
2501974	BH21-07 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)	Benzo(a)pyrene	µg/g	0.3	0.38

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z750737
PROJECT: 21451149
ATTENTION TO: Laura Jones
SAMPLING SITE:Ottawa Hospital
SAMPLED BY:Robert Ireland

Soil Analysis

RPT Date: Jun 01, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - All Metals (Soil)															
Antimony	2512502		<0.8	<0.8	NA	< 0.8	100%	70%	130%	97%	80%	120%	100%	70%	130%
Arsenic	2512502		7	7	0.0%	< 1	103%	70%	130%	108%	80%	120%	105%	70%	130%
Barium	2512502		71.4	71.1	0.4%	< 2.0	99%	70%	130%	99%	80%	120%	99%	70%	130%
Beryllium	2512502		0.8	0.7	NA	< 0.4	98%	70%	130%	108%	80%	120%	99%	70%	130%
Boron	2512502		15	14	NA	< 5	94%	70%	130%	101%	80%	120%	92%	70%	130%
Boron (Hot Water Soluble)	2509593		0.37	0.28	NA	< 0.10	86%	60%	140%	103%	70%	130%	92%	60%	140%
Cadmium	2512502		<0.5	<0.5	NA	< 0.5	114%	70%	130%	99%	80%	120%	104%	70%	130%
Chromium	2512502		31	32	3.2%	< 5	101%	70%	130%	101%	80%	120%	108%	70%	130%
Cobalt	2512502		18.4	18.2	1.1%	< 0.5	102%	70%	130%	109%	80%	120%	100%	70%	130%
Copper	2512502		39.4	39.3	0.3%	< 1.0	100%	70%	130%	101%	80%	120%	101%	70%	130%
Lead	2512502		12	12	0.0%	< 1	98%	70%	130%	98%	80%	120%	85%	70%	130%
Molybdenum	2512502		<0.5	<0.5	NA	< 0.5	102%	70%	130%	101%	80%	120%	101%	70%	130%
Nickel	2512502		37	37	0.0%	< 1	100%	70%	130%	107%	80%	120%	98%	70%	130%
Selenium	2512502		<0.8	<0.8	NA	< 0.8	100%	70%	130%	91%	80%	120%	103%	70%	130%
Silver	2512502		<0.5	<0.5	NA	< 0.5	97%	70%	130%	109%	80%	120%	101%	70%	130%
Thallium	2512502		<0.5	<0.5	NA	< 0.5	101%	70%	130%	110%	80%	120%	102%	70%	130%
Uranium	2512502		0.74	0.73	NA	< 0.50	109%	70%	130%	102%	80%	120%	106%	70%	130%
Vanadium	2512502		40.3	40.9	1.5%	< 0.4	103%	70%	130%	109%	80%	120%	108%	70%	130%
Zinc	2512502		80	79	1.3%	< 5	103%	70%	130%	98%	80%	120%	104%	70%	130%
Chromium, Hexavalent	2501971	2501971	<0.2	<0.2	NA	< 0.2	92%	70%	130%	93%	80%	120%	81%	70%	130%
Mercury	2512502		<0.10	<0.10	NA	< 0.10	105%	70%	130%	92%	80%	120%	99%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

O. Reg. 153(511) - ORPs (Soil)									
Electrical Conductivity (2:1)	2501962	2501962	0.320	0.329	2.8%	< 0.005	111%	80%	120%
Sodium Adsorption Ratio (2:1) (Calc.)	2501962	2501962	0.718	0.758	5.4%	NA			

Comments: NA signifies Not Applicable.
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Duplicate NA: results are under 5X the RDL and will not be calculated.

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z750737
PROJECT: 21451149
ATTENTION TO: Laura Jones
SAMPLING SITE:Ottawa Hospital
SAMPLED BY:Robert Ireland

Trace Organics Analysis

RPT Date: Jun 01, 2021

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)															
F2 (C10 to C16)	2381640		< 10	< 10	NA	< 10	90%	60%	140%	85%	60%	140%	73%	60%	140%
F3 (C16 to C34)	2381640		< 10	< 10	NA	< 10	111%	60%	140%	84%	60%	140%	73%	60%	140%
F4 (C34 to C50)	2381640		< 50	< 50	NA	< 50	101%	60%	140%	100%	60%	140%	118%	60%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	2502030		<0.05	<0.05	NA	< 0.05	85%	50%	140%	89%	50%	140%	66%	50%	140%
Acenaphthylene	2502030		<0.05	<0.05	NA	< 0.05	103%	50%	140%	75%	50%	140%	75%	50%	140%
Acenaphthene	2502030		<0.05	<0.05	NA	< 0.05	107%	50%	140%	84%	50%	140%	78%	50%	140%
Fluorene	2502030		<0.05	<0.05	NA	< 0.05	111%	50%	140%	75%	50%	140%	82%	50%	140%
Phenanthrene	2502030		<0.05	<0.05	NA	< 0.05	90%	50%	140%	89%	50%	140%	72%	50%	140%
Anthracene	2502030		<0.05	<0.05	NA	< 0.05	121%	50%	140%	86%	50%	140%	91%	50%	140%
Fluoranthene	2502030		<0.05	<0.05	NA	< 0.05	126%	50%	140%	85%	50%	140%	96%	50%	140%
Pyrene	2502030		<0.05	<0.05	NA	< 0.05	120%	50%	140%	84%	50%	140%	93%	50%	140%
Benz(a)anthracene	2502030		<0.05	<0.05	NA	< 0.05	85%	50%	140%	102%	50%	140%	76%	50%	140%
Chrysene	2502030		<0.05	<0.05	NA	< 0.05	132%	50%	140%	85%	50%	140%	99%	50%	140%
Benzo(b)fluoranthene	2502030		<0.05	<0.05	NA	< 0.05	64%	50%	140%	86%	50%	140%	64%	50%	140%
Benzo(k)fluoranthene	2502030		<0.05	<0.05	NA	< 0.05	93%	50%	140%	89%	50%	140%	83%	50%	140%
Benzo(a)pyrene	2502030		<0.05	<0.05	NA	< 0.05	84%	50%	140%	85%	50%	140%	81%	50%	140%
Indeno(1,2,3-cd)pyrene	2502030		<0.05	<0.05	NA	< 0.05	65%	50%	140%	84%	50%	140%	57%	50%	140%
Dibenz(a,h)anthracene	2502030		<0.05	<0.05	NA	< 0.05	68%	50%	140%	78%	50%	140%	62%	50%	140%
Benzo(g,h,i)perylene	2502030		<0.05	<0.05	NA	< 0.05	63%	50%	140%	89%	50%	140%	56%	50%	140%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	2502030		<0.05	<0.05	NA	< 0.05	88%	50%	140%	99%	50%	140%	101%	50%	140%
Vinyl Chloride	2502030		<0.02	<0.02	NA	< 0.02	104%	50%	140%	99%	50%	140%	86%	50%	140%
Bromomethane	2502030		<0.05	<0.05	NA	< 0.05	81%	50%	140%	73%	50%	140%	76%	50%	140%
Trichlorofluoromethane	2502030		<0.05	<0.05	NA	< 0.05	78%	50%	140%	79%	50%	140%	75%	50%	140%
Acetone	2502030		<0.50	<0.50	NA	< 0.50	75%	50%	140%	88%	50%	140%	89%	50%	140%
1,1-Dichloroethylene	2502030		<0.05	<0.05	NA	< 0.05	87%	50%	140%	116%	60%	130%	76%	50%	140%
Methylene Chloride	2502030		<0.05	<0.05	NA	< 0.05	94%	50%	140%	112%	60%	130%	99%	50%	140%
Trans- 1,2-Dichloroethylene	2502030		<0.05	<0.05	NA	< 0.05	88%	50%	140%	106%	60%	130%	76%	50%	140%
Methyl tert-butyl Ether	2502030		<0.05	<0.05	NA	< 0.05	82%	50%	140%	87%	60%	130%	83%	50%	140%
1,1-Dichloroethane	2502030		<0.02	<0.02	NA	< 0.02	92%	50%	140%	112%	60%	130%	86%	50%	140%
Methyl Ethyl Ketone	2502030		<0.50	<0.50	NA	< 0.50	99%	50%	140%	88%	50%	140%	81%	50%	140%
Cis- 1,2-Dichloroethylene	2502030		<0.02	<0.02	NA	< 0.02	77%	50%	140%	96%	60%	130%	79%	50%	140%
Chloroform	2502030		<0.04	<0.04	NA	< 0.04	80%	50%	140%	103%	60%	130%	82%	50%	140%
1,2-Dichloroethane	2502030		<0.03	<0.03	NA	< 0.03	106%	50%	140%	101%	60%	130%	101%	50%	140%
1,1,1-Trichloroethane	2502030		<0.05	<0.05	NA	< 0.05	73%	50%	140%	94%	60%	130%	102%	50%	140%
Carbon Tetrachloride	2502030		<0.05	<0.05	NA	< 0.05	90%	50%	140%	95%	60%	130%	81%	50%	140%
Benzene	2502030		<0.02	<0.02	NA	< 0.02	113%	50%	140%	95%	60%	130%	110%	50%	140%

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z750737
PROJECT: 21451149
ATTENTION TO: Laura Jones
SAMPLING SITE:Ottawa Hospital
SAMPLED BY:Robert Ireland

Trace Organics Analysis (Continued)

RPT Date: Jun 01, 2021

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,2-Dichloropropane	2502030		<0.03	<0.03	NA	< 0.03	105%	50%	140%	85%	60%	130%	108%	50%	140%
Trichloroethylene	2502030		<0.03	<0.03	NA	< 0.03	107%	50%	140%	94%	60%	130%	106%	50%	140%
Bromodichloromethane	2502030		<0.05	<0.05	NA	< 0.05	76%	50%	140%	93%	60%	130%	80%	50%	140%
Methyl Isobutyl Ketone	2502030		<0.50	<0.50	NA	< 0.50	94%	50%	140%	97%	50%	140%	87%	50%	140%
1,1,2-Trichloroethane	2502030		<0.04	<0.04	NA	< 0.04	100%	50%	140%	93%	60%	130%	117%	50%	140%
Toluene	2502030		<0.05	<0.05	NA	< 0.05	96%	50%	140%	103%	60%	130%	111%	50%	140%
Dibromochloromethane	2502030		<0.05	<0.05	NA	< 0.05	79%	50%	140%	81%	60%	130%	76%	50%	140%
Ethylene Dibromide	2502030		<0.04	<0.04	NA	< 0.04	95%	50%	140%	85%	60%	130%	109%	50%	140%
Tetrachloroethylene	2502030		<0.05	<0.05	NA	< 0.05	89%	50%	140%	101%	60%	130%	104%	50%	140%
1,1,1,2-Tetrachloroethane	2502030		<0.04	<0.04	NA	< 0.04	100%	50%	140%	109%	60%	130%	84%	50%	140%
Chlorobenzene	2502030		<0.05	<0.05	NA	< 0.05	91%	50%	140%	97%	60%	130%	113%	50%	140%
Ethylbenzene	2502030		<0.05	<0.05	NA	< 0.05	91%	50%	140%	95%	60%	130%	108%	50%	140%
m & p-Xylene	2502030		<0.05	<0.05	NA	< 0.05	93%	50%	140%	109%	60%	130%	114%	50%	140%
Bromoform	2502030		<0.05	<0.05	NA	< 0.05	78%	50%	140%	77%	60%	130%	70%	50%	140%
Styrene	2502030		<0.05	<0.05	NA	< 0.05	114%	50%	140%	94%	60%	130%	105%	50%	140%
1,1,2,2-Tetrachloroethane	2502030		<0.05	<0.05	NA	< 0.05	100%	50%	140%	102%	60%	130%	98%	50%	140%
o-Xylene	2502030		<0.05	<0.05	NA	< 0.05	94%	50%	140%	98%	60%	130%	97%	50%	140%
1,3-Dichlorobenzene	2502030		<0.05	<0.05	NA	< 0.05	104%	50%	140%	109%	60%	130%	116%	50%	140%
1,4-Dichlorobenzene	2502030		<0.05	<0.05	NA	< 0.05	82%	50%	140%	90%	60%	130%	75%	50%	140%
1,2-Dichlorobenzene	2502030		<0.05	<0.05	NA	< 0.05	100%	50%	140%	101%	60%	130%	110%	50%	140%
n-Hexane	2502030		<0.05	<0.05	NA	< 0.05	94%	50%	140%	78%	60%	130%	107%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popnikolof

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET 93 -6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Mercury	MET-93-6103	modified from EPA 7471B and SM 3112 B	ICP-MS
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Sodium Adsorption Ratio (2:1) (Calc.)	INOR-93-6007	modified from EPA 6010D & Analytical Protocol	ICP/OES

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z750737
PROJECT: 21451149
ATTENTION TO: Laura Jones
SAMPLING SITE:Ottawa Hospital
SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluorene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benz(a)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
1 and 2 Methlynaphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5106	modified from EPA 3541 and EPA 8270E	GC/MS
Acenaphthene-d10	ORG-91-5106	modified from EPA 3541 and EPA 8270E	GC/MS
Chrysene-d12	ORG-91-5106	modified from EPA 3541 and EPA 8270E	GC/MS
Moisture Content	ORG-91-5009	CCME Tier 1 Method	BALANCE
F1 (C6 - C10)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
Toluene-d8	VOL-91-5009	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34) minus PAHs	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Benzene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Toluene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Ethylbenzene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
m & p-Xylene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
o-Xylene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Xylenes (Total)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Dichlorodifluoromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750737

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1,1,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene (Cis + Trans)	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

AGAT Laboratories

1 Cr BIK

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Laboratory Use Only
Work Order #: 21750737

Cooler Quantity: one - ice
Arrival Temperatures: 9.3 | 9.1 | 9.5
(LT Ice) 7.1 | 5.1 | 3.1
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Report Information:
Company: Golder Associates
Contact: Laura Jones
Address: 1931 Robertson Road, Nepean Ontario
Phone: (226) 378-2489 Fax:
Reports to be sent to:
1. Email: Laura_Jones@golder.com; GAL_EQUIS@golder.com
2. Email: Rochelle_Mathew@Golder.com

Regulatory Requirements: ☐ No Regulatory Requirement
(Please check all applicable boxes)

☑ Regulation 153/04
Table 7 *Indicate One*
☑ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☑ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region _____ *Indicate One*

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other _____ *Indicate One*

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☑ Yes ☐ No

Turnaround Time (TAT) Required:
Regular TAT ☑ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Project Information:
Project: 21451149
Site Location: Ottawa Hospital
Sampled By: Robert Ireland
AGAT Quote #: SO
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:
Bill To Same: Yes ☑ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend
B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☑ B-HWS ☐ Cl⁻ ☐ CN⁻ ☑ Cr⁶⁺ ☑ EC ☐ FOC ☐ NO_3/NO_2 ☑ Hg ☐ pH ☑ SAR ☐ Total N	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	Volatiles: ☐ VOC ☑ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use			VOCs	pH					
BH21-02 SA2	05/18/21		3	Soil			☑	☑		☑			☑		☑							☑							
BH21-03 SA2	05/18/21		3	Soil			☑	☑		☑			☑		☑							☑							
BH21-03 SA22	05/18/21		2	Soil	Limited sample		☑	☑		☑			☑		☑							☑							
BH21-03 SA3	05/18/21		3	Soil	Extract&hold/Hold metals/ORF		☑	☑		☑			☑		☑							☑							
BH21-04 SA3	05/13/21		2	Soil	Limited sample		☑	☑		☑		☑	☑		☑														
BH21-05 SA1	05/14/21		2	Soil	Limited sample		☑	☑		☑		☑	☑		☑														
BH21-06 SA2	05/14/21		3	Soil			☑	☑		☑		☑	☑		☑														
BH21-07 SA2	05/17/21		2	Soil	Limited sample		☑	☑		☑		☑	☑		☑														
BH21-11 SA1	05/13/21		3	Soil			☑	☑		☑		☑	☑		☑														
BH21-13 SA3	05/13/21		3	Soil			☑	☑		☑			☑		☑							☑							
BH21-07 SA3	05/17/21		1	Soil											☑														

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Rochelle Mathew	05/21/2021	15:00		21/5/21	15h30
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
	21/5/21	16h00	Adriana Bellavia	May 22/21	11:30

Page 1 of 1
N°:

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

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CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Laura Jones

PROJECT: 21451149

AGAT WORK ORDER: 21Z750739

SOIL ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Jun 02, 2021

PAGES (INCLUDING COVER): 13

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

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Certificate of Analysis

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - All Metals (Soil)

DATE RECEIVED: 2021-05-21

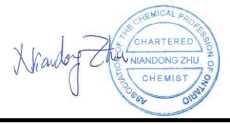
DATE REPORTED: 2021-06-02

		SAMPLE DESCRIPTION:		BH21-13 SA1
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-05-18
Parameter	Unit	G / S	RDL	2501939
Antimony	µg/g	40	0.8	<0.8
Arsenic	µg/g	18	1	3
Barium	µg/g	670	2.0	188
Beryllium	µg/g	8	0.4	<0.4
Boron	µg/g	120	5	<5
Boron (Hot Water Soluble)	µg/g	2	0.10	0.21
Cadmium	µg/g	1.9	0.5	<0.5
Chromium	µg/g	160	5	48
Cobalt	µg/g	80	0.5	11.8
Copper	µg/g	230	1.0	24.9
Lead	µg/g	120	1	18
Molybdenum	µg/g	40	0.5	0.7
Nickel	µg/g	270	1	29
Selenium	µg/g	5.5	0.8	<0.8
Silver	µg/g	40	0.5	<0.5
Thallium	µg/g	3.3	0.5	<0.5
Uranium	µg/g	33	0.50	0.78
Vanadium	µg/g	86	0.4	53.9
Zinc	µg/g	340	5	82
Chromium, Hexavalent	µg/g	8	0.2	<0.2
Mercury	µg/g	3.9	0.10	<0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-02

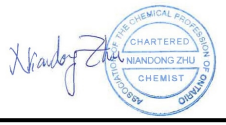
		SAMPLE DESCRIPTION:		BH21-13 SA1
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-05-18
Parameter	Unit	G / S	RDL	2501939
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	0.166
Sodium Adsorption Ratio (2:1) (Calc.)	N/A	12	N/A	0.110

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501939 EC was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). SAR is a calculated parameter.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 21Z750739
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-02

		SAMPLE DESCRIPTION:		BH21-13 SA1
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-05-18
Parameter	Unit	G / S	RDL	2501939
Naphthalene	µg/g	9.6	0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05
Acenaphthene	µg/g	96	0.05	<0.05
Fluorene	µg/g	62	0.05	<0.05
Phenanthrene	µg/g	12	0.05	0.06
Anthracene	µg/g	0.67	0.05	<0.05
Fluoranthene	µg/g	9.6	0.05	0.13
Pyrene	µg/g	96	0.05	0.12
Benz(a)anthracene	µg/g	0.96	0.05	0.06
Chrysene	µg/g	9.6	0.05	0.06
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.11
Benzo(k)fluoranthene	µg/g	0.96	0.05	0.10
Benzo(a)pyrene	µg/g	0.3	0.05	0.07
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	<0.05
1 and 2 Methlynaphthalene	µg/g	76	0.05	<0.05
Moisture Content	%		0.1	22.7
Surrogate	Unit	Acceptable Limits		
Naphthalene-d8	%	50-140		78
Acenaphthene-d10	%	50-140		90
Chrysene-d12	%	50-140		92

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501939 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: NPopowich

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Certificate of Analysis

AGAT WORK ORDER: 21Z750739
PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Ottawa Hospital

ATTENTION TO: Laura Jones
SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-02

		SAMPLE DESCRIPTION:		BH21-13 SA1
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-05-18
Parameter	Unit	G / S	RDL	2501939
Benzene	µg/g	0.32	0.02	<0.02
Toluene	µg/g	68	0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05
m & p-Xylene	µg/g		0.05	<0.05
o-Xylene	µg/g		0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05
F1 (C6 - C10)	µg/g	55	5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5
F2 (C10 to C16)	µg/g	230	10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10
F3 (C16 to C34)	µg/g	1700	50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50
F4 (C34 to C50)	µg/g	3300	50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA
Moisture Content	%		0.1	22.7
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	60-140		82
Terphenyl	%	60-140		100

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-05-21

DATE REPORTED: 2021-06-02

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2501939 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popowich

AGAT Laboratories

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

Soil Analysis

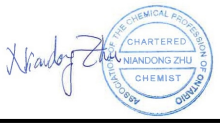
RPT Date: Jun 02, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - All Metals (Soil)															
Antimony	2519108		<0.8	<0.8	NA	< 0.8	130%	70%	130%	108%	80%	120%	101%	70%	130%
Arsenic	2519108		2	2	NA	< 1	113%	70%	130%	109%	80%	120%	110%	70%	130%
Barium	2519108		12.1	12.3	1.6%	< 2.0	109%	70%	130%	105%	80%	120%	104%	70%	130%
Beryllium	2519108		<0.4	<0.4	NA	< 0.4	73%	70%	130%	106%	80%	120%	100%	70%	130%
Boron	2519108		5	5	NA	< 5	98%	70%	130%	98%	80%	120%	90%	70%	130%
Boron (Hot Water Soluble)	2502027		<0.10	<0.10	NA	< 0.10	82%	60%	140%	92%	70%	130%	92%	60%	140%
Cadmium	2519108		<0.5	<0.5	NA	< 0.5	88%	70%	130%	106%	80%	120%	103%	70%	130%
Chromium	2519108		8	8	NA	< 5	96%	70%	130%	109%	80%	120%	112%	70%	130%
Cobalt	2519108		3.1	3.1	0.0%	< 0.5	99%	70%	130%	110%	80%	120%	106%	70%	130%
Copper	2519108		7.7	7.8	1.3%	< 1.0	85%	70%	130%	107%	80%	120%	94%	70%	130%
Lead	2519108		6	6	0.0%	< 1	107%	70%	130%	103%	80%	120%	93%	70%	130%
Molybdenum	2519108		<0.5	<0.5	NA	< 0.5	114%	70%	130%	114%	80%	120%	113%	70%	130%
Nickel	2519108		6	5	18.2%	< 1	97%	70%	130%	109%	80%	120%	100%	70%	130%
Selenium	2519108		<0.8	<0.8	NA	< 0.8	131%	70%	130%	103%	80%	120%	106%	70%	130%
Silver	2519108		<0.5	<0.5	NA	< 0.5	98%	70%	130%	110%	80%	120%	94%	70%	130%
Thallium	2519108		<0.5	<0.5	NA	< 0.5	98%	70%	130%	105%	80%	120%	98%	70%	130%
Uranium	2519108		<0.50	<0.50	NA	< 0.50	103%	70%	130%	103%	80%	120%	102%	70%	130%
Vanadium	2519108		13.9	14.0	0.7%	< 0.4	104%	70%	130%	108%	80%	120%	117%	70%	130%
Zinc	2519108		32	32	0.0%	< 5	101%	70%	130%	112%	80%	120%	113%	70%	130%
Chromium, Hexavalent	2512724		<0.2	<0.2	NA	< 0.2	92%	70%	130%	93%	80%	120%	73%	70%	130%
Mercury	2519108		<0.10	<0.10	NA	< 0.10	107%	70%	130%	104%	80%	120%	100%	70%	130%

Comments: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

O. Reg. 153(511) - ORPs (Soil)									
Electrical Conductivity (2:1)	2519880	0.222	0.217	2.3%	< 0.005	93%	80%	120%	
Sodium Adsorption Ratio (2:1) (Calc.)	2519880	0.144	0.147	2.1%	N/A				

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:



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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

Trace Organics Analysis

RPT Date: Jun 02, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	2519888		<0.02	<0.02	NA	< 0.02	116%	60%	140%	106%	60%	140%	90%	60%	140%
Toluene	2519888		<0.05	<0.05	NA	< 0.05	113%	60%	140%	107%	60%	140%	84%	60%	140%
Ethylbenzene	2519888		<0.05	<0.05	NA	< 0.05	116%	60%	140%	97%	60%	140%	98%	60%	140%
m & p-Xylene	2519888		<0.05	<0.05	NA	< 0.05	105%	60%	140%	101%	60%	140%	88%	60%	140%
o-Xylene	2519888		<0.05	<0.05	NA	< 0.05	104%	60%	140%	95%	60%	140%	93%	60%	140%
F1 (C6 - C10)	2519888		<5	<5	NA	< 5	103%	60%	140%	100%	60%	140%	99%	60%	140%
F2 (C10 to C16)	2381640		< 10	< 10	NA	< 10	90%	60%	140%	85%	60%	140%	73%	60%	140%
F3 (C16 to C34)	2381640		< 10	< 10	NA	< 10	111%	60%	140%	84%	60%	140%	73%	60%	140%
F4 (C34 to C50)	2381640		< 50	< 50	NA	< 50	101%	60%	140%	100%	60%	140%	118%	60%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	2501391		<0.05	<0.05	NA	< 0.05	84%	50%	140%	89%	50%	140%	74%	50%	140%
Acenaphthylene	2501391		<0.05	<0.05	NA	< 0.05	104%	50%	140%	75%	50%	140%	83%	50%	140%
Acenaphthene	2501391		<0.05	<0.05	NA	< 0.05	109%	50%	140%	85%	50%	140%	87%	50%	140%
Fluorene	2501391		<0.05	<0.05	NA	< 0.05	112%	50%	140%	84%	50%	140%	91%	50%	140%
Phenanthrene	2501391		<0.05	<0.05	NA	< 0.05	95%	50%	140%	76%	50%	140%	79%	50%	140%
Anthracene	2501391		<0.05	<0.05	NA	< 0.05	116%	50%	140%	85%	50%	140%	96%	50%	140%
Fluoranthene	2501391		<0.05	<0.05	NA	< 0.05	124%	50%	140%	89%	50%	140%	101%	50%	140%
Pyrene	2501391		<0.05	<0.05	NA	< 0.05	119%	50%	140%	86%	50%	140%	96%	50%	140%
Benz(a)anthracene	2501391		<0.05	<0.05	NA	< 0.05	92%	50%	140%	85%	50%	140%	77%	50%	140%
Chrysene	2501391		<0.05	<0.05	NA	< 0.05	114%	50%	140%	84%	50%	140%	95%	50%	140%
Benzo(b)fluoranthene	2501391		<0.05	<0.05	NA	< 0.05	69%	50%	140%	75%	50%	140%	59%	50%	140%
Benzo(k)fluoranthene	2501391		<0.05	<0.05	NA	< 0.05	88%	50%	140%	89%	50%	140%	71%	50%	140%
Benzo(a)pyrene	2501391		<0.05	<0.05	NA	< 0.05	86%	50%	140%	86%	50%	140%	73%	50%	140%
Indeno(1,2,3-cd)pyrene	2501391		<0.05	<0.05	NA	0.29	64%	50%	140%	85%	50%	140%	54%	50%	140%
Dibenz(a,h)anthracene	2501391		<0.05	<0.05	NA	< 0.05	70%	50%	140%	84%	50%	140%	58%	50%	140%
Benzo(g,h,i)perylene	2501391		<0.05	<0.05	NA	0.31	59%	50%	140%	78%	50%	140%	51%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popowkolof

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QA Violation

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

ATTENTION TO: Laura Jones

RPT Date: Jun 02, 2021

PARAMETER	Sample Id	Sample Description	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - All Metals (Soil)											
Selenium		BH21-13 SA1	131%	70%	130%	103%	80%	120%	106%	70%	130%

Comments: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET 93 -6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Mercury	MET-93-6103	modified from EPA 7471B and SM 3112 B	ICP-MS
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Sodium Adsorption Ratio (2:1) (Calc.)	INOR-93-6007	modified from EPA 6010D & Analytical Protocol	ICP/OES

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z750739
PROJECT: 21451149
ATTENTION TO: Laura Jones
SAMPLING SITE:Ottawa Hospital
SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluorene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benz(a)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
1 and 2 Methlynaphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5106	modified from EPA 3541 and EPA 8270E	GC/MS
Acenaphthene-d10	ORG-91-5106	modified from EPA 3541 and EPA 8270E	GC/MS
Chrysene-d12	ORG-91-5106	modified from EPA 3541 and EPA 8270E	GC/MS
Moisture Content	ORG-91-5009	CCME Tier 1 Method	BALANCE
Benzene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Toluene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Ethylbenzene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
m & p-Xylene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
o-Xylene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Xylenes (Total)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
F1 (C6 - C10)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
Toluene-d8	VOL-91-5009	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z750739

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:Ottawa Hospital

SAMPLED BY:Robert Ireland

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
F3 (C16 to C34) minus PAHs	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

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Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only
Work Order #: 21775073 9

Cooler Quantity: one ice
Arrival Temperatures: 9.3 | 9.1 | 9.5
(LTCICE) 7.1 | 5.1 | 3.1
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes:

Report Information:
Company: Golder Associates
Contact: Laura Jones
Address: 1931 Robertson Road, Nepean Ontario
Phone: (226) 378-2489 Fax:
Reports to be sent to:
1. Email: Laura_Jones@golder.com; GAL_EQUIS@golder.com
2. Email: Rochelle_Mathew@Golder.com

Regulatory Requirements:
☐ No Regulatory Requirement
(Please check all applicable boxes)

☑ Regulation 153/04 Table 7 (Indicate One)
☑ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One) ☑ Coarse ☐ Fine

☐ Sewer Use ☐ Sanitary ☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☑ Yes ☐ No

Turnaround Time (TAT) Required:
Regular TAT ☑ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Project Information:
Project: 21451149
Site Location: Ottawa Hospital
Sampled By: Robert Ireland
AGAT Quote #: SO
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:
Bill To Same: Yes ☑ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend
B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☑ B-HWS ☐ Cl ☐ CN ☑ Cr⁶⁺ ☒ EC ☐ FOC ☐ NO_3/NO_2 ☐ Total N ☑ Hg ☐ pH ☑ SAR	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_2 ☐ NO_3/NO_2	Volatiles: ☐ VOC ☑ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use			VOCs	pH					
BH21-13 SA1	05/18/21		3	Soil			☑	☑		☑		☑	☑		☑														

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Rochelle Mathew	05/21/2021	15:00		21-5-21	15h30
Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
	21-5-21	16h00	Adriana Bellavia	May 22/21	11:30

Page 1 of 1
№:

Pink Copy - Client | Yellow Copy - AGAT | White Copy - AGAT

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Certificate of Analysis

AGAT WORK ORDER: 21Z753437

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - All Metals (Soil)

DATE RECEIVED: 2021-05-28

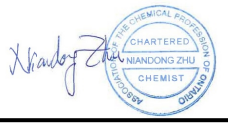
DATE REPORTED: 2021-06-10

SAMPLE DESCRIPTION:				BH21-08 SA1	BH21-09 SA2	BH21-10 SA2	BH21-12 SA1
SAMPLE TYPE:				Soil	Soil	Soil	Soil
DATE SAMPLED:				2021-05-18	2021-05-18	2021-05-18	2021-05-19
Parameter	Unit	G / S	RDL	2530200	2530201	2530203	2530204
Antimony	µg/g	40	0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	3	5	4	2
Barium	µg/g	670	2.0	130	125	133	73.5
Beryllium	µg/g	8	0.4	0.4	0.4	0.5	<0.4
Boron	µg/g	120	5	<5	7	6	<5
Boron (Hot Water Soluble)	µg/g	2	0.10	0.28	0.30	0.45	0.18
Cadmium	µg/g	1.9	0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	160	5	35	26	35	18
Cobalt	µg/g	80	0.5	10.1	10.3	9.6	5.9
Copper	µg/g	230	1.0	22.0	24.0	23.8	12.6
Lead	µg/g	120	1	13	56	28	11
Molybdenum	µg/g	40	0.5	1.0	1.4	1.3	0.8
Nickel	µg/g	270	1	22	20	21	11
Selenium	µg/g	5.5	0.8	<0.8	<0.8	<0.8	<0.8
Silver	µg/g	40	0.5	<0.5	<0.5	<0.5	<0.5
Thallium	µg/g	3.3	0.5	<0.5	<0.5	<0.5	<0.5
Uranium	µg/g	33	0.50	0.97	0.79	0.80	0.63
Vanadium	µg/g	86	0.4	43.7	35.1	37.5	29.0
Zinc	µg/g	340	5	62	84	72	40
Chromium, Hexavalent	µg/g	8	0.2	<0.2	<0.2	<0.2	<0.2
Mercury	µg/g	3.9	0.10	<0.10	<0.10	<0.10	<0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 21Z753437

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - EC/SAR

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

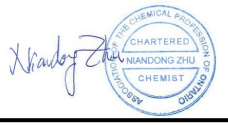
		SAMPLE DESCRIPTION:		BH21-08 SA1	BH21-09 SA2	BH21-10 SA2	BH21-12 SA1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2021-05-18	2021-05-18	2021-05-18	2021-05-19
Parameter	Unit	G / S	RDL	2530200	2530201	2530203	2530204
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	0.197	0.446	0.351	0.185
Sodium Adsorption Ratio	NA	12	NA	0.213	0.142	0.103	0.923

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2530200-2530204 SAR is a calculated parameter.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 21Z753437

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

		SAMPLE DESCRIPTION:		BH21-08 SA1	BH21-09 SA2	BH21-10 SA1	BH21-12 SA1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2021-05-18	2021-05-18	2021-05-18	2021-05-19
Parameter	Unit	G / S	RDL	2530200	2530201	2530202	2530204
Naphthalene	µg/g	9.6	0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	96	0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	12	0.05	0.05	0.27	<0.05	<0.05
Anthracene	µg/g	0.67	0.05	<0.05	0.09	<0.05	<0.05
Fluoranthene	µg/g	9.6	0.05	0.11	0.37	<0.05	0.06
Pyrene	µg/g	96	0.05	0.09	0.30	<0.05	0.05
Benz(a)anthracene	µg/g	0.96	0.05	<0.05	0.13	<0.05	<0.05
Chrysene	µg/g	9.6	0.05	<0.05	0.13	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.10	0.38	0.06	0.08
Benzo(k)fluoranthene	µg/g	0.96	0.05	<0.05	0.19	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	0.08	0.26	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	<0.05	0.12	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	9.6	0.05	<0.05	0.13	<0.05	<0.05
1 and 2 Methlynaphthalene	µg/g	76	0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	5.1	8.2	14.1	15.8
Surrogate	Unit	Acceptable Limits					
Naphthalene-d8	%	50-140		60	69	72	76
Acenaphthene-d10	%	50-140		63	70	73	76
Chrysene-d12	%	50-140		64	60	72	60

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2530200-2530204 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: NPopowkolof

AGAT Laboratories

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CANADA L4Z 1Y2
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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 21Z753437

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

		SAMPLE DESCRIPTION:		BH21-08 SA1	BH21-09 SA2	BH21-10 SA1	BH21-12 SA1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2021-05-18	2021-05-18	2021-05-18	2021-05-19
Parameter	Unit	G / S	RDL	2530200	2530201	2530202	2530204
Benzene	µg/g	0.32	0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	68	0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05	<0.05	<0.05	<0.05
m & p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 - C10)	µg/g		5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	230	10	<10	<10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	1700	50	<50	<50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50	<50	<50	<50
F4 (C34 to C50)	µg/g	3300	50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA	NA	NA	NA
Moisture Content	%		0.1	5.1	8.2	14.1	15.8
Surrogate	Unit	Acceptable Limits					
Toluene-d8	% Recovery	60-140		84	77	88	90
Terphenyl	%	60-140		110	98	122	102

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z753437

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2530200-2530204 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popowkolof

AGAT Laboratories

LT 8.1/8.2/7.4 Free ICE

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Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 21275343 7

Cooler Quantity: 1

Arrival Temperatures: 8.2 | 8.4 | 8.4

Custody Seal Intact: ☐ Yes ☐ No ☒ N/A

Notes: IQ

Report Information:

Company: Golder Associates

Contact: Laura Jones

Address: 1931 Robertson Road, Nepean Ontario

Phone: (226) 378-2489 Fax:

Reports to be sent to:

1. Email: Laura_Jones@golder.com; GAL_EQUIS@golder.com
2. Email: Rochelle_Mathew@Golder.com

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☑ Regulation 153/04
Table 7 (Indicate One)
☑ Ind/Com
☐ Res/Park
☐ Agriculture

Soil Texture (Check One)
☑ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm

Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☑ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Project Information:

Project: 21451149

Site Location: Ottawa Hospital

Sampled By: Robert Ireland

AGAT Quote #: SO

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:

Contact:

Address:

Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions
~~BH~~21-08 SA1	05/18/21		2	Soil	limited sample
~~BH~~21-09 SA2	05/18/21		2	Soil	limited sample
~~BH~~21-10 SA1	05/18/21		3	Soil	
~~BH~~21-10 SA2	05/18/21		2	Soil	limited sample
~~BH~~21-12 SA1	05/19/21		3	Soil	

(Check Applicable)

Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☑ B-HWS ☐ Cl ☐ CN ☑ EC ☑ Cr^{6+} ☐ FOC ☐ NO_3/NO_2 ☐ Total N ☑ Hg ☐ pH ☑ SAR	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	Volatiles: ☐ VOC ☑ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use	VOCs	pH
	☑	☑		☑		☑	☑		☑							
	☑	☑		☑		☑	☑		☑							
						☑	☑		☑							
	☑	☑		☑												
	☑	☑		☑		☑	☑		☑							

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Rochelle Mathew	05/28/2021	15:00		28 May 21	15:10
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
			NEAL G	29 May 21	11:30 am

Page 1 of 1

N°:

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

AGAT Laboratories

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http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600
ATTENTION TO: Laura Jones
PROJECT: Ottawa Hospital
AGAT WORK ORDER: 21Z753765
TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist
WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer
DATE REPORTED: Jun 10, 2021
PAGES (INCLUDING COVER): 20
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

VERSION 1:Revised report with IDs updated as per client request. 2021/06/10

AGAT Laboratories
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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

				SAMPLE DESCRIPTION:	BH21-05	BH21-02	MW17-2	BH21-10	DUP-3	BH21-03	BH21-06
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2021-05-27 11:45	2021-05-27 10:00	2021-05-27 13:00	2021-05-27 12:15	2021-05-27 08:55	2021-05-27 08:50	2021-05-27 10:40
Parameter	Unit	G / S	RDL		2535433	2535653	2535654	2535776	2535777	2535778	2535779
Naphthalene	µg/L	1400	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	µg/L	1.8	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthene	µg/L	600	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Fluorene	µg/L	400	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phenanthrene	µg/L	580	0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	2.4	0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	130	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	µg/L	68	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)anthracene	µg/L	4.7	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	µg/L	1	0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b)fluoranthene	µg/L	0.75	0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(k)fluoranthene	µg/L	0.4	0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene	µg/L	0.81	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	µg/L	0.52	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	µg/L	0.2	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-and 1-methyl Naphthalene	µg/L	1800	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Sediment					NO	NO	NO	NO	NO	NO	NO
Surrogate	Unit	Acceptable Limits									
Naphthalene-d8	%	50-140			105	101	108	106	112	117	108
Acridine-d9	%	50-140			118	109	112	118	108	119	109
Terphenyl-d14	%	50-140			90	61	106	64	81	111	105

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2535433-2535779 Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popnikolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

				SAMPLE DESCRIPTION:	BH21-05	BH21-02	MW17-2	BH21-10	DUP-3	BH21-03	BH21-06
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2021-05-27 11:45	2021-05-27 10:00	2021-05-27 13:00	2021-05-27 12:15	2021-05-27 08:55	2021-05-27 08:50	2021-05-27 10:40
Parameter	Unit	G / S	RDL		2535433	2535653	2535654	2535776	2535777	2535778	2535779
F1 (C6-C10)	µg/L	750	25		<25	<25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25		<25	<25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100		<100	<100	<100	<100	<100	<100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100		<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100		<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34) minus PAHs	µg/L		100		<100	<100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100		<100	<100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500		NA	NA	NA	NA	NA	NA	NA
Sediment					No	No	No	No	No	No	No
Surrogate	Unit	Acceptable Limits									
Toluene-d8	% Recovery	50-140			89.2	96.2	93.8	86.2	92	76	108
Terphenyl	% Recovery	60-140			103	83	93	92	117	111	106

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2535433-2535779 The C6-C10 fraction is calculated using toluene response factor.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popnikolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1/BTEX (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

		SAMPLE DESCRIPTION:		TRIP BLANK
		SAMPLE TYPE:		Water
		DATE SAMPLED:		
Parameter	Unit	G / S	RDL	2535742
Benzene	µg/L	44	0.20	<0.20
Toluene	µg/L	18000	0.20	<0.20
Ethylbenzene	µg/L	2300	0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20
o-Xylene	µg/L		0.10	<0.10
Xylenes (Total)	µg/L	4200	0.20	<0.20
F1 (C6-C10)	µg/L	750	25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	60-140		95.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2535742 The C6-C10 fraction is calculated using Toluene response factor.
Total C6-C10 results are corrected for BTEX contributions.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
Extraction and holding times were met for this sample.
NA = Not Applicable

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popowkolof

AGAT Laboratories
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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

SAMPLE DESCRIPTION:				BH21-05		BH21-02		MW17-2	BH21-10	DUP-3	BH21-03
SAMPLE TYPE:				Water		Water		Water	Water	Water	Water
DATE SAMPLED:				2021-05-27 11:45		2021-05-27 10:00		2021-05-27 13:00	2021-05-27 12:15	2021-05-27 08:55	2021-05-27 08:50
Parameter	Unit	G / S	RDL	2535433	RDL	2535653	RDL	2535654	2535776	2535777	2535778
Dichlorodifluoromethane	µg/L	4400	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L	0.5	0.17	<0.17	0.34	<0.34	0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L	5.6	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	2500	0.40	<0.40	0.80	<0.80	0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L	130000	1.0	<1.0	2.0	<2.0	1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L	1.6	0.30	<0.30	0.60	<0.60	0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L	610	0.30	<0.30	0.60	<0.60	0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L	190	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L	320	0.30	<0.30	0.60	<0.60	0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L	470000	1.0	<1.0	2.0	<2.0	1.0	<1.0	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	0.20	2.09	0.40	<0.40	0.20	<0.20	1.98	0.87	1.06
1,2-Dichloroethane	µg/L	1.6	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L	640	0.30	<0.30	0.60	<0.60	0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	0.79	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	44	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L	16	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	1.6	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	85000	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L	140000	1.0	<1.0	2.0	<2.0	1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L	4.7	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	18000	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L	82000	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L	0.25	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L	1.6	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L	630	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2300	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10

Certified By: N Popnikolof

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

		SAMPLE DESCRIPTION:		BH21-05		BH21-02		MW17-2	BH21-10	DUP-3	BH21-03
		SAMPLE TYPE:		Water		Water		Water	Water	Water	Water
		DATE SAMPLED:		2021-05-27 11:45		2021-05-27 10:00		2021-05-27 13:00	2021-05-27 12:15	2021-05-27 08:55	2021-05-27 08:50
Parameter	Unit	G / S	RDL	2535433	RDL	2535653	RDL	2535654	2535776	2535777	2535778
m & p-Xylene	µg/L		0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	µg/L	380	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L	1300	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L	3.2	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L	9600	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	8	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	4600	0.10	<0.10	0.20	<0.20	0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L	5.2	0.30	<0.30	0.60	<0.60	0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	4200	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
n-Hexane	µg/L	51	0.20	<0.20	0.40	<0.40	0.20	<0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits									
Toluene-d8	% Recovery	50-140		100	2	99	1	93	95	100	94
4-Bromofluorobenzene	% Recovery	50-140		86	2	88	1	82	84	86	84

Certified By: NPopowich

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

				SAMPLE DESCRIPTION:	BH21-06
				SAMPLE TYPE:	Water
				DATE SAMPLED:	2021-05-27 10:40
Parameter	Unit	G / S	RDL		2535779
Dichlorodifluoromethane	µg/L	4400	0.40		<0.40
Vinyl Chloride	µg/L	0.5	0.34		<0.34
Bromomethane	µg/L	5.6	0.40		<0.40
Trichlorofluoromethane	µg/L	2500	0.80		<0.80
Acetone	µg/L	130000	2.0		<2.0
1,1-Dichloroethylene	µg/L	1.6	0.60		<0.60
Methylene Chloride	µg/L	610	0.60		<0.60
trans- 1,2-Dichloroethylene	µg/L	1.6	0.40		<0.40
Methyl tert-butyl ether	µg/L	190	0.40		<0.40
1,1-Dichloroethane	µg/L	320	0.60		<0.60
Methyl Ethyl Ketone	µg/L	470000	2.0		<2.0
cis- 1,2-Dichloroethylene	µg/L	1.6	0.40		<0.40
Chloroform	µg/L	2.4	0.40		2.09
1,2-Dichloroethane	µg/L	1.6	0.40		<0.40
1,1,1-Trichloroethane	µg/L	640	0.60		<0.60
Carbon Tetrachloride	µg/L	0.79	0.40		<0.40
Benzene	µg/L	44	0.40		<0.40
1,2-Dichloropropane	µg/L	16	0.40		<0.40
Trichloroethylene	µg/L	1.6	0.40		<0.40
Bromodichloromethane	µg/L	85000	0.40		<0.40
Methyl Isobutyl Ketone	µg/L	140000	2.0		<2.0
1,1,2-Trichloroethane	µg/L	4.7	0.40		<0.40
Toluene	µg/L	18000	0.40		0.81
Dibromochloromethane	µg/L	82000	0.20		<0.20
Ethylene Dibromide	µg/L	0.25	0.20		<0.20
Tetrachloroethylene	µg/L	1.6	0.40		<0.40
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.20		<0.20
Chlorobenzene	µg/L	630	0.20		<0.20
Ethylbenzene	µg/L	2300	0.20		<0.20

Certified By: NPopowich

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

				SAMPLE DESCRIPTION:	BH21-06
				SAMPLE TYPE:	Water
				DATE SAMPLED:	2021-05-27 10:40
Parameter	Unit	G / S	RDL		2535779
m & p-Xylene	µg/L		0.40		<0.40
Bromoform	µg/L	380	0.20		<0.20
Styrene	µg/L	1300	0.20		<0.20
1,1,2,2-Tetrachloroethane	µg/L	3.2	0.20		<0.20
o-Xylene	µg/L		0.20		<0.20
1,3-Dichlorobenzene	µg/L	9600	0.20		<0.20
1,4-Dichlorobenzene	µg/L	8	0.20		<0.20
1,2-Dichlorobenzene	µg/L	4600	0.20		<0.20
1,3-Dichloropropene	µg/L	5.2	0.60		<0.60
Xylenes (Total)	µg/L	4200	0.40		<0.40
n-Hexane	µg/L	51	0.40		<0.40
Surrogate	Unit	Acceptable Limits			
Toluene-d8	% Recovery	50-140			96
4-Bromofluorobenzene	% Recovery	50-140			85

Certified By: N Popowkolof

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2535433 Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.
The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

2535653 Dilution factor=2
The sample was diluted because it was foamy. The reporting detection limit has been corrected for the dilution factor used.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.
The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

2535654-2535778 Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.
The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

2535779 Dilution factor=2
The sample was diluted because it was foamy. The reporting detection limit has been corrected for the dilution factor used.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.
The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popowkolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - All Metals (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

				SAMPLE DESCRIPTION:	BH21-05	BH21-02	MW17-2	BH21-10	DUP-3	BH21-03	BH21-06
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2021-05-27 11:45	2021-05-27 10:00	2021-05-27 13:00	2021-05-27 12:15	2021-05-27 08:55	2021-05-27 08:50	2021-05-27 10:40
Parameter	Unit	G / S	RDL		2535433	2535653	2535654	2535776	2535777	2535778	2535779
Dissolved Antimony	µg/L	20000	1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Arsenic	µg/L	1900	1.0		1.6	17.9	3.9	<1.0	1.1	3.6	<1.0
Dissolved Barium	µg/L	29000	2.0		101	234	51.1	63.7	150	154	187
Dissolved Beryllium	µg/L	67	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Boron	µg/L	45000	10.0		42.9	75.0	85.3	79.7	48.2	58.5	113
Dissolved Cadmium	µg/L	2.7	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Chromium	µg/L	810	2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Dissolved Cobalt	µg/L	66	0.50		0.64	<0.50	1.07	0.78	<0.50	0.58	1.60
Dissolved Copper	µg/L	87	1.0		2.2	1.2	2.0	1.2	2.7	2.2	4.4
Dissolved Lead	µg/L	25	0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dissolved Molybdenum	µg/L	9200	0.50		4.92	10.5	1.90	5.66	1.37	1.70	1.83
Dissolved Nickel	µg/L	490	3.0		3.7	4.2	3.9	3.7	<3.0	<3.0	12.6
Dissolved Selenium	µg/L	63	1.0		2.1	<1.0	3.0	2.7	4.2	3.9	3.5
Dissolved Silver	µg/L	1.5	0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Thallium	µg/L	510	0.30		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dissolved Uranium	µg/L	420	0.50		3.06	2.46	2.90	2.80	1.82	1.92	1.87
Dissolved Vanadium	µg/L	250	0.40		1.30	0.42	<0.40	<0.40	0.51	<0.40	0.79
Dissolved Zinc	µg/L	1100	5.0		10.3	18.1	236	<5.0	<5.0	<5.0	6.3
Mercury	µg/L	0.29	0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium VI	µg/L	140	2		<2	<2	<2	<2	<2	<2	<2

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2535433-2535779 Metals analysis completed on a filtered sample.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Water)

DATE RECEIVED: 2021-05-28

DATE REPORTED: 2021-06-10

		SAMPLE DESCRIPTION:		BH21-05		BH21-02		MW17-2	BH21-10	DUP-3	BH21-03
		SAMPLE TYPE:		Water		Water		Water	Water	Water	Water
		DATE SAMPLED:		2021-05-27 11:45		2021-05-27 10:00		2021-05-27 13:00	2021-05-27 12:15	2021-05-27 08:55	2021-05-27 08:50
Parameter	Unit	G / S	RDL	2535433	RDL	2535653	RDL	2535654	2535776	2535777	2535778
Dissolved Sodium	µg/L	2300000	100	29500	500	2180000	100	42400	29000	217000	217000
Chloride	µg/L	2300000	100	5710	244	3390000	100	19000	5440	173000	103000

		SAMPLE DESCRIPTION:		BH21-06
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2021-05-27 10:40
Parameter	Unit	G / S	RDL	2535779
Dissolved Sodium	µg/L	2300000	100	85900
Chloride	µg/L	2300000	100	18400

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2535433-2535779 Dilution required, RDL has been increased accordingly.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Exceedance Summary

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
2535653	BH21-02	ON T3 NPGW CT	O. Reg. 153(511) - ORPs (Water)	Chloride	µg/L	2300000	3390000

AGAT Laboratories
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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z753765
PROJECT: Ottawa Hospital
ATTENTION TO: Laura Jones
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Jun 10, 2021

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)															
F1 (C6-C10)	2517770		<25	<25	NA	< 25	93%	60%	140%	107%	60%	140%	107%	60%	140%
F2 (C10 to C16)	2538374		390	340	NA	< 100	102%	60%	140%	75%	60%	140%	90%	60%	140%
F3 (C16 to C34)	2538374		< 100	< 100	NA	< 100	99%	60%	140%	72%	60%	140%	88%	60%	140%
F4 (C34 to C50)	2538374		< 100	< 100	NA	< 100	102%	60%	140%	74%	60%	140%	103%	60%	140%
O. Reg. 153(511) - PAHs (Water)															
Naphthalene	2535778	2535778	<0.20	<0.20	NA	< 0.20	88%	50%	140%	101%	50%	140%	106%	50%	140%
Acenaphthylene	2535778	2535778	<0.20	<0.20	NA	< 0.20	110%	50%	140%	102%	50%	140%	103%	50%	140%
Acenaphthene	2535778	2535778	<0.20	<0.20	NA	< 0.20	112%	50%	140%	93%	50%	140%	96%	50%	140%
Fluorene	2535778	2535778	<0.20	<0.20	NA	< 0.20	116%	50%	140%	97%	50%	140%	101%	50%	140%
Phenanthrene	2535778	2535778	<0.10	<0.10	NA	< 0.10	109%	50%	140%	98%	50%	140%	98%	50%	140%
Anthracene	2535778	2535778	<0.10	<0.10	NA	< 0.10	98%	50%	140%	86%	50%	140%	87%	50%	140%
Fluoranthene	2535778	2535778	<0.20	<0.20	NA	< 0.20	114%	50%	140%	101%	50%	140%	100%	50%	140%
Pyrene	2535778	2535778	<0.20	<0.20	NA	< 0.20	120%	50%	140%	105%	50%	140%	102%	50%	140%
Benzo(a)anthracene	2535778	2535778	<0.20	<0.20	NA	< 0.20	79%	50%	140%	76%	50%	140%	75%	50%	140%
Chrysene	2535778	2535778	<0.10	<0.10	NA	< 0.10	107%	50%	140%	140%	50%	140%	87%	50%	140%
Benzo(b)fluoranthene	2535778	2535778	<0.10	<0.10	NA	< 0.10	98%	50%	140%	93%	50%	140%	81%	50%	140%
Benzo(k)fluoranthene	2535778	2535778	<0.10	<0.10	NA	< 0.10	82%	50%	140%	111%	50%	140%	94%	50%	140%
Benzo(a)pyrene	2535778	2535778	<0.01	<0.01	NA	< 0.01	107%	50%	140%	90%	50%	140%	88%	50%	140%
Indeno(1,2,3-cd)pyrene	2535778	2535778	<0.20	<0.20	NA	< 0.20	85%	50%	140%	78%	50%	140%	77%	50%	140%
Dibenz(a,h)anthracene	2535778	2535778	<0.20	<0.20	NA	< 0.20	77%	50%	140%	82%	50%	140%	85%	50%	140%
Benzo(g,h,i)perylene	2535778	2535778	<0.20	<0.20	NA	< 0.20	118%	50%	140%	112%	50%	140%	110%	50%	140%
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	2529730		<0.20	<0.20	NA	< 0.20	81%	50%	140%	89%	50%	140%	97%	50%	140%
Vinyl Chloride	2529730		<0.17	<0.17	NA	< 0.17	101%	50%	140%	104%	50%	140%	83%	50%	140%
Bromomethane	2529730		<0.20	<0.20	NA	< 0.20	93%	50%	140%	119%	50%	140%	105%	50%	140%
Trichlorofluoromethane	2529730		<0.40	<0.40	NA	< 0.40	95%	50%	140%	98%	50%	140%	109%	50%	140%
Acetone	2529730		<1.0	<1.0	NA	< 1.0	103%	50%	140%	85%	50%	140%	89%	50%	140%
1,1-Dichloroethylene	2529730		<0.30	<0.30	NA	< 0.30	113%	50%	140%	115%	60%	130%	82%	50%	140%
Methylene Chloride	2529730		<0.30	<0.30	NA	< 0.30	117%	50%	140%	90%	60%	130%	98%	50%	140%
trans- 1,2-Dichloroethylene	2529730		<0.20	<0.20	NA	< 0.20	82%	50%	140%	115%	60%	130%	84%	50%	140%
Methyl tert-butyl ether	2529730		<0.20	<0.20	NA	< 0.20	80%	50%	140%	96%	60%	130%	107%	50%	140%
1,1-Dichloroethane	2529730		<0.30	<0.30	NA	< 0.30	93%	50%	140%	116%	60%	130%	107%	50%	140%
Methyl Ethyl Ketone	2529730		<1.0	<1.0	NA	< 1.0	88%	50%	140%	93%	50%	140%	88%	50%	140%
cis- 1,2-Dichloroethylene	2529730		<0.20	<0.20	NA	< 0.20	86%	50%	140%	111%	60%	130%	106%	50%	140%
Chloroform	2529730		<0.20	<0.20	NA	< 0.20	103%	50%	140%	98%	60%	130%	108%	50%	140%
1,2-Dichloroethane	2529730		<0.20	<0.20	NA	< 0.20	115%	50%	140%	112%	60%	130%	94%	50%	140%
1,1,1-Trichloroethane	2529730		<0.30	<0.30	NA	< 0.30	101%	50%	140%	113%	60%	130%	109%	50%	140%
Carbon Tetrachloride	2529730		<0.20	<0.20	NA	< 0.20	117%	50%	140%	104%	60%	130%	98%	50%	140%

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z753765
PROJECT: Ottawa Hospital
ATTENTION TO: Laura Jones
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Jun 10, 2021

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzene	2529730		0.51	0.55	NA	< 0.20	106%	50%	140%	101%	60%	130%	87%	50%	140%
1,2-Dichloropropane	2529730		<0.20	<0.20	NA	< 0.20	95%	50%	140%	83%	60%	130%	83%	50%	140%
Trichloroethylene	2529730		<0.20	<0.20	NA	< 0.20	106%	50%	140%	103%	60%	130%	54%	50%	140%
Bromodichloromethane	2529730		<0.20	<0.20	NA	< 0.20	105%	50%	140%	98%	60%	130%	103%	50%	140%
Methyl Isobutyl Ketone	2529730		<1.0	<1.0	NA	< 1.0	97%	50%	140%	109%	50%	140%	111%	50%	140%
1,1,2-Trichloroethane	2529730		<0.20	<0.20	NA	< 0.20	107%	50%	140%	92%	60%	130%	88%	50%	140%
Toluene	2529730		<0.20	<0.20	NA	< 0.20	100%	50%	140%	96%	60%	130%	103%	50%	140%
Dibromochloromethane	2529730		<0.10	<0.10	NA	< 0.10	115%	50%	140%	98%	60%	130%	117%	50%	140%
Ethylene Dibromide	2529730		<0.10	<0.10	NA	< 0.10	96%	50%	140%	94%	60%	130%	81%	50%	140%
Tetrachloroethylene	2529730		<0.20	<0.20	NA	< 0.20	119%	50%	140%	97%	60%	130%	95%	50%	140%
1,1,1,2-Tetrachloroethane	2529730		<0.10	<0.10	NA	< 0.10	115%	50%	140%	94%	60%	130%	79%	50%	140%
Chlorobenzene	2529730		<0.10	<0.10	NA	< 0.10	102%	50%	140%	92%	60%	130%	94%	50%	140%
Ethylbenzene	2529730		<0.10	<0.10	NA	< 0.10	103%	50%	140%	115%	60%	130%	119%	50%	140%
m & p-Xylene	2529730		<0.20	<0.20	NA	< 0.20	102%	50%	140%	111%	60%	130%	99%	50%	140%
Bromoform	2529730		<0.10	<0.10	NA	< 0.10	78%	50%	140%	98%	60%	130%	97%	50%	140%
Styrene	2529730		<0.10	<0.10	NA	< 0.10	97%	50%	140%	86%	60%	130%	85%	50%	140%
1,1,2,2-Tetrachloroethane	2529730		<0.10	<0.10	NA	< 0.10	104%	50%	140%	108%	60%	130%	80%	50%	140%
o-Xylene	2529730		<0.10	<0.10	NA	< 0.10	95%	50%	140%	86%	60%	130%	82%	50%	140%
1,3-Dichlorobenzene	2529730		<0.10	<0.10	NA	< 0.10	110%	50%	140%	95%	60%	130%	95%	50%	140%
1,4-Dichlorobenzene	2529730		<0.10	<0.10	NA	< 0.10	87%	50%	140%	98%	60%	130%	107%	50%	140%
1,2-Dichlorobenzene	2529730		<0.10	<0.10	NA	< 0.10	105%	50%	140%	92%	60%	130%	86%	50%	140%
n-Hexane	2529730		<0.20	<0.20	NA	< 0.20	83%	50%	140%	99%	60%	130%	111%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

O. Reg. 153(511) - PHCs F1/BTEX (Water)

Benzene	2517770		0.40	0.35	NA	< 0.20	119%	60%	140%	108%	60%	140%	86%	60%	140%
Toluene	2517770		0.37	0.30	NA	< 0.20	111%	60%	140%	103%	60%	140%	80%	60%	140%
Ethylbenzene	2517770		<0.10	<0.10	NA	< 0.10	100%	60%	140%	99%	60%	140%	80%	60%	140%
m & p-Xylene	2517770		<0.20	<0.20	NA	< 0.20	99%	60%	140%	92%	60%	140%	103%	60%	140%
o-Xylene	2517770		<0.10	<0.10	NA	< 0.10	88%	60%	140%	104%	60%	140%	90%	60%	140%
F1 (C6-C10)	2517770		<25	<25	NA	< 25	93%	60%	140%	107%	60%	140%	107%	60%	140%

Certified By: N Popnikolof

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 21Z753765
PROJECT: Ottawa Hospital
ATTENTION TO: Laura Jones
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Jun 10, 2021

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	DUPLICATE Dup #2	DUPLICATE RPD	Method Blank	REFERENCE MATERIAL Measured Value	REFERENCE MATERIAL Acceptable Limits Lower	REFERENCE MATERIAL Acceptable Limits Upper	METHOD BLANK SPIKE Recovery	METHOD BLANK SPIKE Acceptable Limits Lower	METHOD BLANK SPIKE Acceptable Limits Upper	MATRIX SPIKE Recovery	MATRIX SPIKE Acceptable Limits Lower	MATRIX SPIKE Acceptable Limits Upper
O. Reg. 153(511) - All Metals (Water)															
Dissolved Antimony	2535433	2535433	<1.0	<1.0	NA	< 1.0	101%	70%	130%	99%	80%	120%	103%	70%	130%
Dissolved Arsenic	2535433	2535433	1.6	1.1	NA	< 1.0	95%	70%	130%	107%	80%	120%	112%	70%	130%
Dissolved Barium	2535433	2535433	101	101	0.0%	< 2.0	99%	70%	130%	98%	80%	120%	106%	70%	130%
Dissolved Beryllium	2535433	2535433	<0.5	<0.5	NA	< 0.5	102%	70%	130%	104%	80%	120%	111%	70%	130%
Dissolved Boron	2535433	2535433	42.9	47.0	NA	< 10.0	97%	70%	130%	101%	80%	120%	101%	70%	130%
Dissolved Cadmium	2535433	2535433	<0.20	<0.20	NA	< 0.20	100%	70%	130%	101%	80%	120%	99%	70%	130%
Dissolved Chromium	2535433	2535433	<2.0	<2.0	NA	< 2.0	101%	70%	130%	100%	80%	120%	104%	70%	130%
Dissolved Cobalt	2535433	2535433	0.64	<0.50	NA	< 0.50	95%	70%	130%	99%	80%	120%	102%	70%	130%
Dissolved Copper	2535433	2535433	2.2	2.7	NA	< 1.0	98%	70%	130%	100%	80%	120%	97%	70%	130%
Dissolved Lead	2535433	2535433	<0.50	<0.50	NA	< 0.50	95%	70%	130%	97%	80%	120%	101%	70%	130%
Dissolved Molybdenum	2535433	2535433	4.92	5.42	9.7%	< 0.50	96%	70%	130%	100%	80%	120%	105%	70%	130%
Dissolved Nickel	2535433	2535433	3.7	3.9	NA	< 3.0	95%	70%	130%	103%	80%	120%	96%	70%	130%
Dissolved Selenium	2535433	2535433	2.1	3.7	NA	< 1.0	100%	70%	130%	110%	80%	120%	107%	70%	130%
Dissolved Silver	2535433	2535433	0.28	<0.20	NA	< 0.20	94%	70%	130%	100%	80%	120%	97%	70%	130%
Dissolved Thallium	2535433	2535433	<0.30	<0.30	NA	< 0.30	97%	70%	130%	97%	80%	120%	101%	70%	130%
Dissolved Uranium	2535433	2535433	3.06	3.07	0.3%	< 0.50	100%	70%	130%	98%	80%	120%	105%	70%	130%
Dissolved Vanadium	2535433	2535433	1.30	0.94	NA	< 0.40	95%	70%	130%	103%	80%	120%	109%	70%	130%
Dissolved Zinc	2535433	2535433	10.3	6.5	NA	< 5.0	94%	70%	130%	106%	80%	120%	98%	70%	130%
Mercury	2530159		<0.02	<0.02	NA	< 0.02	99%	70%	130%	102%	80%	120%	100%	70%	130%
Chromium VI	2522698		<2	<2	NA	< 2	103%	70%	130%	106%	80%	120%	105%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

O. Reg. 153(511) - ORPs (Water)															
Dissolved Sodium	2535433	2535433	29500	29500	0.0%	< 50	100%	70%	130%	98%	80%	120%	96%	70%	130%
Chloride	2529726		511000	513000	0.4%	< 100	94%	70%	130%	103%	80%	120%	NA	70%	130%

Comments: NA signifies Not Applicable.
Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By:

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluorene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Chrysene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acridine-d9	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Terphenyl-d14	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Sediment			
F1 (C6-C10)	VOL-91-5010	modified from MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	modified from MOE PHC-E3421	P&T GC/FID
Toluene-d8	VOL-91-5010	modified from MOE PHC-E3421	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F3 (C16 to C34) minus PAHs	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	modified from MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
Benzene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5010	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F1 (C6-C10)	VOL-91-5010	modified from MOE E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	modified from MOE E3421	(P&T)GC/FID
Dichlorodifluoromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

AGAT Laboratories

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z753765

PROJECT: Ottawa Hospital

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Antimony	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Beryllium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cobalt	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Molybdenum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Nickel	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Selenium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silver	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Thallium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Uranium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Vanadium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Chromium VI	INOR-93-6034	modified from SM 3500-CR B	LACHAT FIA
Dissolved Sodium	MET-93-6105	modified from EPA 6010D	ICP/OES
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH

L·T → 10·1 | 10·4 | 9·9
8·1 | 8·4 | 9·6

AGAT Laboratories

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Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only

Work Order #: 21Z753765

Cooler Quantity: two · on ice ,

Arrival Temperatures: 2.9 | 2.4 | 2.6
2.4 | 3.2 | 3.2

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: Golder Associates Ltd.
Contact: Laura Jones
Address: 1931 Robertson Rd, Ottawa, Ont
Phone: Fax:
Reports to be sent to: Gal Equis @ Golder.com
1. Email: Laura Jones @ Golder.com
2. Email: RMathew @ Golder.com.

Regulatory Requirements:
(Please check all applicable boxes)

☒ Regulation 153/04 — Table 3 (Indicate One): ☐ Ind/Com ☒ Res/Park ☐ Agriculture

Soil Texture (Check One): ☒ Coarse ☐ Fine

☐ Excess Soils R406 — Table ____ (Indicate One)

☐ Regulation 558

☐ CCME

☐ Sewer Use ☐ Sanitary ☐ Storm — Region

☐ Prov. Water Quality Objectives (PWQO)

☐ Other ____ (Indicate One)

Is this submission for a Record of Site Condition? ☒ Yes ☐ No

Report Guideline on Certificate of Analysis ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT (Most Analysis) ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: Ottawa Hospital
Site Location:
Sampled By: Sam O / R Mathew
AGAT ID #: SO PO: 2145149-2000

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information: Bill To Same: Yes ☐ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

Code	Matrix
B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	O. Reg 153: Metals - ☒CrVI ☒Hg, ☐HWSB	O. Reg 153: BTEX, F1-F4 PHCs / Analyze F4G if required ☐Yes ☐No	PAHs	Total PCBs ☐Aroclor	VOC	O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐M&I ☐VOCs ☐ABNs ☐B(a)P ☐PCBs	O. Reg 406: Excess Soils SPLP Rainwater Leach SPLP: ☐Metals ☐VOCs ☐SVOCs	O. Reg 406: Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	Na, Cl	As, Se, Sb	Potentially Hazardous or High Concentration (Y/N)
BH21-05	27/05/21	11:45 AM/PM	17	GW		Y		✓	✓	✓		✓					✓	✓	
BH21-02	27/05/21	10:00 AM/PM	17	GW		Y		✓	✓	✓		✓					✓	✓	
MW 17-2	27/05/21	13:00 AM/PM	16	GW		Y		✓	✓	✓		✓					✓	✓	
Trip blank	—	— AM/PM	3	W		N			✓										
21-10	27/05/21	12:15 AM/PM	16	GW		Y		✓	✓	✓		✓					✓	✓	
DUP-3	27/05/21	08:55 AM/PM	16	GW		Y		✓	✓	✓		✓					✓	✓	
21-03	27/05/21	08:55 AM/PM	16	GW		Y		✓	✓	✓		✓					✓	✓	
21-06	27/05/21	10:40 AM/PM	16	GW		Y		✓	✓	✓		✓					✓	✓	
		AM PM																	
		AM PM																	
		AM PM																	

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Rachelle Mathew Mathew	27/05/21	1520	Uperthelet	21/5/28	9h30
to Kms	21/5/28	10hrs	Pakshaunya	May 29	11:30am

Page 1 of 1

Nº: T 118684

Pink Copy - Client | Yellow Copy - AGAT | White Copy - AGAT

AGAT Laboratories

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http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600
ATTENTION TO: Laura Jones
PROJECT: 21451149
AGAT WORK ORDER: 21Z764993
SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer
TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist
DATE REPORTED: Jun 29, 2021
PAGES (INCLUDING COVER): 13
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

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Certificate of Analysis

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - All Metals (Soil)

DATE RECEIVED: 2021-06-22

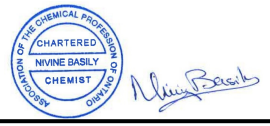
DATE REPORTED: 2021-06-29

		SAMPLE DESCRIPTION:		21-01 SA2
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-06-11
Parameter	Unit	G / S	RDL	2644793
Antimony	µg/g	40	0.8	1.5
Arsenic	µg/g	18	1	7
Barium	µg/g	670	2.0	211
Beryllium	µg/g	8	0.4	<0.4
Boron	µg/g	120	5	11
Boron (Hot Water Soluble)	µg/g	2	0.10	0.28
Cadmium	µg/g	1.9	0.5	<0.5
Chromium	µg/g	160	5	16
Cobalt	µg/g	80	0.5	6.7
Copper	µg/g	230	1.0	11.9
Lead	µg/g	120	1	83
Molybdenum	µg/g	40	0.5	3.8
Nickel	µg/g	270	1	11
Selenium	µg/g	5.5	0.8	<0.8
Silver	µg/g	40	0.5	<0.5
Thallium	µg/g	3.3	0.5	<0.5
Uranium	µg/g	33	0.50	0.63
Vanadium	µg/g	86	0.4	20.2
Zinc	µg/g	340	5	136
Chromium, Hexavalent	µg/g	8	0.2	<0.2
Mercury	µg/g	3.9	0.10	0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2021-06-22

DATE REPORTED: 2021-06-29

		SAMPLE DESCRIPTION:		21-01 SA2
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-06-11
Parameter	**Unit**	**G / S**	**RDL**	**2644793**
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	**2.86**
Cyanide, Free	µg/g	0.051	0.040	<0.040
Sodium Adsorption Ratio (2:1) (Calc.)	N/A	12	N/A	0.661

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2644793 EC was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). SAR is a calculated parameter.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2021-06-22

DATE REPORTED: 2021-06-29

		SAMPLE DESCRIPTION:		21-01 SA2
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-06-11
Parameter	**Unit**	**G / S**	**RDL**	**2644793**
Naphthalene	µg/g	9.6	0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	<0.05
Acenaphthene	µg/g	96	0.05	0.12
Fluorene	µg/g	62	0.05	0.18
Phenanthrene	µg/g	12	0.05	1.12
Anthracene	µg/g	0.67	0.05	0.43
Fluoranthene	µg/g	9.6	0.05	1.36
Pyrene	µg/g	96	0.05	1.09
Benz(a)anthracene	µg/g	0.96	0.05	0.55
Chrysene	µg/g	9.6	0.05	0.82
Benzo(b)fluoranthene	µg/g	0.96	0.05	0.62
Benzo(k)fluoranthene	µg/g	0.96	0.05	0.52
Benzo(a)pyrene	µg/g	0.3	0.05	**0.46**
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	**0.29**
Benzo(g,h,i)perylene	µg/g	9.6	0.05	0.17
1 and 2 Methlynaphthalene	µg/g	76	0.05	<0.05
Moisture Content	%		0.1	8.7
Surrogate	**Unit**	**Acceptable Limits**		
Naphthalene-d8	%	50-140		98
Acridine-d9	%	50-140		85
Terphenyl-d14	%	50-140		76

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2644793 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: NPopowich

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Certificate of Analysis

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-06-22

DATE REPORTED: 2021-06-29

		SAMPLE DESCRIPTION:		21-01 SA2
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-06-11
Parameter	**Unit**	**G / S**	**RDL**	**2644793**
Benzene	µg/g	0.32	0.02	<0.02
Toluene	µg/g	68	0.05	<0.05
Ethylbenzene	µg/g	9.5	0.05	<0.05
m & p-Xylene	µg/g		0.05	<0.05
o-Xylene	µg/g		0.05	<0.05
Xylenes (Total)	µg/g	26	0.05	<0.05
F1 (C6 - C10)	µg/g		5	21.9
F1 (C6 to C10) minus BTEX	µg/g	55	5	22
F2 (C10 to C16)	µg/g	230	10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10
F3 (C16 to C34)	µg/g	1700	50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50
F4 (C34 to C50)	µg/g	3300	50	73
Gravimetric Heavy Hydrocarbons	µg/g	3300	50	NA
Moisture Content	%		0.1	8.7
Surrogate	**Unit**	**Acceptable Limits**		
Toluene-d8	% Recovery	60-140		72
Terphenyl	%	60-140		69

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2021-06-22 **DATE REPORTED: 2021-06-29**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2644793 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Analysis perfomed at AGAT Toronto (unless marked by *)

Certified By: N Popowich

AGAT Laboratories

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CANADA L4Z 1Y2
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Exceedance Summary

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Laura Jones

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
2644793	21-01 SA2	ON T7 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	2.86
2644793	21-01 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Benzo(a)pyrene	µg/g	0.3	0.46
2644793	21-01 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PAHs (Soil)	Dibenz(a,h)anthracene	µg/g	0.1	0.29
2644793	21-01 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)	Benzo(a)pyrene	µg/g	0.3	0.46
2644793	21-01 SA2	ON T7 S ICC CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)	Dibenzo(a,h)anthracene	µg/g	0.1	0.29

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Jun 29, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - All Metals (Soil)															
Antimony	2661594		<0.8	<0.8	NA	< 0.8	120%	70%	130%	99%	80%	120%	77%	70%	130%
Arsenic	2661594		2	2	NA	< 1	116%	70%	130%	103%	80%	120%	97%	70%	130%
Barium	2661594		65.0	59.5	8.8%	< 2.0	107%	70%	130%	95%	80%	120%	81%	70%	130%
Beryllium	2661594		0.5	0.5	NA	< 0.4	110%	70%	130%	95%	80%	120%	97%	70%	130%
Boron	2661594		9	9	NA	< 5	92%	70%	130%	99%	80%	120%	83%	70%	130%
Boron (Hot Water Soluble)	2660343		0.37	0.38	NA	< 0.10	87%	60%	140%	93%	70%	130%	91%	60%	140%
Cadmium	2661594		<0.5	<0.5	NA	< 0.5	112%	70%	130%	101%	80%	120%	94%	70%	130%
Chromium	2661594		20	19	NA	< 5	108%	70%	130%	100%	80%	120%	85%	70%	130%
Cobalt	2661594		6.0	5.5	8.7%	< 0.5	104%	70%	130%	98%	80%	120%	90%	70%	130%
Copper	2661594		11.2	10.4	7.4%	< 1.0	91%	70%	130%	102%	80%	120%	85%	70%	130%
Lead	2661594		10	9	10.5%	< 1	106%	70%	130%	92%	80%	120%	82%	70%	130%
Molybdenum	2661594		<0.5	<0.5	NA	< 0.5	117%	70%	130%	100%	80%	120%	98%	70%	130%
Nickel	2661594		11	10	9.5%	< 1	100%	70%	130%	99%	80%	120%	86%	70%	130%
Selenium	2661594		<0.8	<0.8	NA	< 0.8	125%	70%	130%	99%	80%	120%	93%	70%	130%
Silver	2661594		<0.5	<0.5	NA	< 0.5	112%	70%	130%	100%	80%	120%	91%	70%	130%
Thallium	2661594		<0.5	<0.5	NA	< 0.5	114%	70%	130%	100%	80%	120%	92%	70%	130%
Uranium	2661594		0.73	0.67	NA	< 0.50	111%	70%	130%	99%	80%	120%	96%	70%	130%
Vanadium	2661594		31.6	30.0	5.2%	< 0.4	115%	70%	130%	98%	80%	120%	87%	70%	130%
Zinc	2661594		57	53	7.3%	< 5	102%	70%	130%	108%	80%	120%	103%	70%	130%
Chromium, Hexavalent	2637215		<0.2	<0.2	NA	< 0.2	108%	70%	130%	90%	80%	120%	110%	70%	130%
Mercury	2661594		<0.10	<0.10	NA	< 0.10	100%	70%	130%	98%	80%	120%	88%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

O. Reg. 153(511) - ORPs (Soil)															
Electrical Conductivity (2:1)	2660241	0.440	0.447	1.6%	< 0.005	108%	80%	120%							
Cyanide, Free	2649005	<0.040	<0.040	NA	< 0.040	96%	70%	130%	112%	80%	120%	94%	70%	130%
Sodium Adsorption Ratio (2:1) (Calc.)	2660343	1.86	1.95	4.6%	NA										

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Jun 29, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	2644793		NA	NA	NA	< 0.05	98%	50%	140%	101%	50%	140%	98%	50%	140%
Acenaphthylene	2644793		NA	NA	NA	< 0.05	97%	50%	140%	82%	50%	140%	85%	50%	140%
Acenaphthene	2644793		NA	NA	NA	< 0.05	95%	50%	140%	96%	50%	140%	96%	50%	140%
Fluorene	2644793		NA	NA	NA	< 0.05	129%	50%	140%	133%	50%	140%	85%	50%	140%
Phenanthrene	2644793		NA	NA	NA	< 0.05	97%	50%	140%	110%	50%	140%	76%	50%	140%
Anthracene	2644793		NA	NA	NA	< 0.05	107%	50%	140%	130%	50%	140%	95%	50%	140%
Fluoranthene	2644793		NA	NA	NA	< 0.05	112%	50%	140%	120%	50%	140%	85%	50%	140%
Pyrene	2644793		NA	NA	NA	< 0.05	109%	50%	140%	118%	50%	140%	96%	50%	140%
Benz(a)anthracene	2644793		NA	NA	NA	< 0.05	82%	50%	140%	104%	50%	140%	85%	50%	140%
Chrysene	2644793		NA	NA	NA	< 0.05	116%	50%	140%	103%	50%	140%	75%	50%	140%
Benzo(b)fluoranthene	2644793		NA	NA	NA	< 0.05	104%	50%	140%	110%	50%	140%	96%	50%	140%
Benzo(k)fluoranthene	2644793		NA	NA	NA	< 0.05	74%	50%	140%	117%	50%	140%	85%	50%	140%
Benzo(a)pyrene	2644793		NA	NA	NA	< 0.05	69%	50%	140%	100%	50%	140%	76%	50%	140%
Indeno(1,2,3-cd)pyrene	2644793		NA	NA	NA	< 0.05	62%	50%	140%	109%	50%	140%	95%	50%	140%
Dibenz(a,h)anthracene	2644793		NA	NA	NA	< 0.05	65%	50%	140%	98%	50%	140%	98%	50%	140%
Benzo(g,h,i)perylene	2644793		NA	NA	NA	< 0.05	50%	50%	140%	124%	50%	140%	85%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	2645720		<0.02	<0.02	NA	< 0.02	113%	60%	140%	109%	60%	140%	84%	60%	140%
Toluene	2645720		<0.05	<0.05	NA	< 0.05	92%	60%	140%	82%	60%	140%	100%	60%	140%
Ethylbenzene	2645720		<0.05	<0.05	NA	< 0.05	89%	60%	140%	116%	60%	140%	89%	60%	140%
m & p-Xylene	2645720		<0.05	<0.05	NA	< 0.05	93%	60%	140%	118%	60%	140%	109%	60%	140%
o-Xylene	2645720		<0.05	<0.05	NA	< 0.05	88%	60%	140%	90%	60%	140%	87%	60%	140%
F1 (C6 - C10)	2645720		<5	<5	NA	< 5	93%	60%	140%	110%	60%	140%	99%	60%	140%
F2 (C10 to C16)	2649028		< 10	< 10	NA	< 10	108%	60%	140%	96%	60%	140%	80%	60%	140%
F3 (C16 to C34)	2649028		< 50	< 50	NA	< 50	110%	60%	140%	76%	60%	140%	76%	60%	140%
F4 (C34 to C50)	2649028		< 50	< 50	NA	< 50	100%	60%	140%	124%	60%	140%	126%	60%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popowkolof

AGAT Laboratories

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET 93 -6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Mercury	MET-93-6103	modified from EPA 7471B and SM 3112 B	ICP-MS
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015, SM 4500-CN- I, G-387	TECHNICON AUTO ANALYZER
Sodium Adsorption Ratio (2:1) (Calc.)	INOR-93-6007	modified from EPA 6010D & Analytical Protocol	ICP/OES

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluorene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benz(a)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Chrysene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
1 and 2 Methlynaphthalene	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Acridine-d9	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Terphenyl-d14	ORG-91-5106	modified from EPA 3570 and EPA 8270E	GC/MS
Moisture Content	ORG-91-5009	CCME Tier 1 Method	BALANCE
Benzene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Toluene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Ethylbenzene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
m & p-Xylene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
o-Xylene	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
Xylenes (Total)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/MS
F1 (C6 - C10)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
Toluene-d8	VOL-91-5009	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 21Z764993

PROJECT: 21451149

ATTENTION TO: Laura Jones

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
F3 (C16 to C34) minus PAHs	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID

AGAT Laboratories

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Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only
Work Order #: 21Z 764993
Cooler Quantity: 1
Arrival Temperatures: 7.3 | 7.2 | 7.2 (7.3 | 6.9 | 7.4)
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: ICE ice pack

Report Information:
Company: Golder Associates
Contact: Laura Jones/Louise Rotteveel/RMathew
Address: 1931 Robertson Road
LRotteveel@Golder.com
Phone: CALEquis@golder.com Fax:
Reports to be sent to:
1. Email: Laura_Jones@Golder.com
2. Email: RMathew@Golder.com

Regulatory Requirements: ☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 7 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region _____ (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:
Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):
_____
Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays
For 'Same Day' analysis, please contact your AGAT CPM

Project Information:
Project: 21451149
Site Location: Ottawa Hospital
Sampled By: Robert Ireland
AGAT Quote #: 80 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:
Bill To Same: Yes ☒ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend
B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☒ Hydride Metals ☐ 153 Metals (incl. Hydrides))	O. Reg 153: ORPs: ☒ B-HWS ☐ Cl ☒ CN ☒ Cr6+ ☒ EC ☐ FOC ☒ Hg ☐ pH ☒ SAR	O. Reg 153: Full Metals Scan	O. Reg 153: Regulation/Custom Metals	O. Reg 153: Nutrients: ☐ TP ☐ NH4 ☐ TKN ☐ NO3 ☐ NO2 ☐ NO3+NO2	O. Reg 153: Volatiles: ☐ VOC ☒ BTEX ☐ THM	O. Reg 153: PHCs F1 - F4	O. Reg 153: ABNs	O. Reg 153: PAHs	O. Reg 153: PCBs: ☐ Total ☐ Aroclors	O. Reg 153: Organochlorine Pesticides	O. Reg 153: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ BaP ☐ PCBs	Sewer Use	Metals
21-01 SA2	June 2021		2	S			✓	✓				✓	✓		✓				✓

Samples Relinquished By (Print Name and Sign): Robert Ireland	Date: Jun/22/2021	Time: 12:00	Samples Received By (Print Name and Sign): Sarah Jones	Date: 22 Jun 21	Time: 1230
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date: 23/6/21	Time: 9:17
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page 1 of 1
N°: T077221

Document ID: DIV 78-1511.015

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APPENDIX D

Historic Analytical Data

Table D1
Historical Petroleum Hydrocarbons and BTEX in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW17-01		MW17-02
Sample Name			MW17-01-SS01	DUP-20170728-D	MW17-02-SS01
Sample Date			2017-07-28	2017-07-28	2017-07-28
Sample Depth			0-1.52 m	0-1.52 m	0-1.52 m
Historic Report			Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**			
Cyanide (free)	0.051	µg/g	< 0.01	< 0.01	< 0.01
Conductivity	1400	uS/cm	1100	1100	150
Fluoride	-	µg/g	< 5	< 5	< 5
Moisture, Percent	-	%	4.1	3.5	17
Sodium Adsorption Ratio	12	-	1.1	1.2	0.28
pH (1:2 CACL2)	-	-	11.3	11.3	7.66

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D2
Historical Petroleum Hydrocarbons and BTEX in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**03-BH2/MW2**	**03-BH5/MW5**	**MW17-01**		**MW17-02**
		Sample Name	**BH2-4-5**	**BH5-2-3**	**MW17-01-SS01**	**DUP-20170728-D (Field Duplicate of MW17-01-SS01)**	**MW17-02-SS01**
		Sample Date	**2003-10-28**	**2003-10-28**	**2017-07-28**	**2017-07-28**	**2017-07-28**
		Sample Depth	**0.8-2.1 m**	**0.8-1.5 m**	**0-1.52 m**	**0-1.52 m**	**0-1.52 m**
		Historic Report	**Intera, January 2004, Ph I/II**	**Intera, January 2004, Ph I/II**	**Stantec, 7 September 2017, Ph II**	**Stantec, 7 September 2017, Ph II**	**Stantec, 7 September 2017, Ph II**
Parameter	**MECP Table 7 Standards[1]**	**Unit**					
Benzene	0.32	µg/g	-	< 0.002	< 0.006	< 0.006	< 0.006
Toluene	68	µg/g	-	< 0.002	< 0.02	< 0.02	< 0.02
Ethylbenzene	9.5	µg/g	-	< 0.002	< 0.01	< 0.01	< 0.01
o-Xylene	-	µg/g	-	< 0.002	< 0.02	< 0.02	< 0.02
m,p-Xylenes	-	µg/g	-	< 0.002	< 0.02	< 0.02	< 0.02
Xylenes, Total	26	µg/g	-	< 0.002	< 0.02	< 0.02	< 0.02
PHC - F1 (C6-C10)-BTEX	55	µg/g	-	-	< 10	< 10	< 10
PHC - F1 (C6-C10)	55	µg/g	< 20	-	< 10	< 10	< 10
PHC - F2 (C10-C16)	230	µg/g	< 10	-	< 10	< 10	< 10
PHC - F3 (C16-C34)	1700	µg/g	160	-	< 50	< 50	< 50
PHC - F4 (C34-C50)	3300	µg/g	160	-	< 50	< 50	< 50
PHC - F4 Gravimetric	3300	µg/g	-	-	-	-	-

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D3
Historical Volatile Organic Compounds in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			03-BH5/MW5	MW17-01		MW17-02
Sample Name			BH5-2-3	MW17-01-SS01	DUP-20170728-D (Field Duplicate of MW17-01-SS01)	MW17-02-SS01
Sample Date			2003-10-28	2017-07-28	2017-07-28	2017-07-28
Sample Depth			0.8-1.5 m	0-1.52 m	0-1.52 m	0-1.52 m
Historical Report			Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	MECP Table 7 Standards[1]	Unit				
1,1,1,2-Tetrachloroethane	0.087	µg/g	< 0.003	< 0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	6.1	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	0.05	µg/g	< 0.003	< 0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	0.05	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,1-Dichloroethane	17	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,1-Dichloroethylene	0.064	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,2-DibroMECPthane	0.05	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	6.8	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,2-Dichloroethane	0.05	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,2-Dichloropropane	0.16	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,3,5-Trimethylbenzene	-	µg/g	< 0.003	-	-	-
1,3-Dichlorobenzene	9.6	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	0.2	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Methyl Ethyl Ketone	70	µg/g	-	< 0.5	< 0.5	< 0.5
Acetone	16	µg/g	-	< 0.5	< 0.5	< 0.5
Bromodichloromethane	18	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Bromoform	0.61	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Bromomethane	0.05	µg/g	< 0.003	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	0.21	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Chlorobenzene	2.4	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Chloroethane	-	µg/g	< 0.005	-	-	-
Chloroform	0.47	µg/g	< 0.003	< 0.05	< 0.05	< 0.05
Chloromethane	-	µg/g	< 0.02	-	-	-
cis-1,2-Dichloroethene	55	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
cis-1,3-Dichloropropene	-	µg/g	< 0.002	< 0.03	< 0.03	< 0.03
Dibromochloromethane	13	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	16	µg/g	-	< 0.05	< 0.05	< 0.05
Hexachloroethane	0.21	µg/g	-	-	-	< 0.002
Methyl tert-Butyl Ether	11	µg/g	-	< 0.05	< 0.05	< 0.05
Methylene Chloride	1.6	µg/g	< 0.02	< 0.05	< 0.05	< 0.05
n-Hexane	46	µg/g	-	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	4.5	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
trans-1,2-Dichloroethene	1.3	µg/g	< 0.003	< 0.05	< 0.05	< 0.05
trans-1,3-Dichloropropene	-	µg/g	< 0.002	< 0.04	< 0.04	< 0.04
Trichloroethene	0.91	µg/g	< 0.003	< 0.01	< 0.01	< 0.01
Trichlorofluoromethane	4	µg/g	< 0.005	< 0.05	< 0.05	< 0.05
Vinyl Chloride	0.032	µg/g	< 0.002	< 0.02	< 0.02	< 0.02
Styrene	34	µg/g	< 0.002	< 0.05	< 0.05	< 0.05
Methyl Isobutyl Ketone	31	µg/g	-	< 0.5	< 0.5	< 0.5

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition

< Indicates parameter was below laboratory equipment detection limit.

- Chemical not analyzed or criteria not defined.

Bold and italicised Detection limit above MECP Table 7 Standards

Bold and shaded Exceeding MECP Table 7 Standards

Table D4
Historical PAHs in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	03-BH2/MW2	03-BH5/MW5	04-BH1	04-BH2	04-BH3	04-BH4	04-BH5		04-BH6
		Sample Name	BH2-4-5/ 03-BH2-4-5	BH5-2-3/ 03-BH2-4-5	04-BH1-2	04-BH2-2	04-BH3-3	04-BH4-2-3	04-BH5-1-2	BHD (DUP 5-1-2)	04-BH6-2
		Sample Date	2003-10-28	2003-10-28	2004-08-31	2004-08-31	2004-08-31	2004-08-31	2004-08-31	2004-08-31	2005-05-31
		Sample Depth	0.8-2.1 m	0.8-1.5 m	0.61-1.07 m	0.61-1.22 m	1.22-1.83 m	0.61-1.52 m	0-1.22 m	0-1.22 m	0.61-1.22 m
		Historical Report	Intera, January 2004, Ph I/II	Intera, January 2004, Ph I/II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II	Intera, Oct. 2005, RA and Intera, 2004 Supp. Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**									
1-Methylnaphthalene	76	µg/g	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.36
2-Methylnaphthalene	76	µg/g	0.04	0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.26
4-Methyl-2-pentanone	31	µg/g	-	-	-	-	-	-	-	-	
Acenaphthene	96	µg/g	< 0.02	0.32	< 0.02	< 0.02	< 0.02	< 0.02	0.02	0.02	0.46
Acenaphthylene	0.15	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.04	0.04	**0.5**
Anthracene	0.67	µg/g	0.02	**0.68**	< 0.02	0.04	< 0.02	0.04	0.16	0.14	**1.5**
Benzo [b,j] fluoranthene	-	µg/g	-	-	-	-	-	-	-	-	
Benzo[a]anthracene	0.96	µg/g	0.06	**1.8**	< 0.02	0.04	< 0.02	0.06	0.28	0.28	**3.4**
Benzo[a]pyrene	0.3	µg/g	0.06	**1.4**	< 0.02	0.04	< 0.02	0.06	0.2	0.22	**2.7**
Benzo[b]fluoranthene	0.96	µg/g	0.12	**2**	< 0.02	0.06	< 0.02	0.08	0.3	0.36	**3.5**
Benzo[g,h,i]perylene	9.6	µg/g	0.08	0.92	< 0.02	0.02	< 0.02	0.08	0.14	0.18	1.7
Benzo[k]fluoranthene	0.96	µg/g	0.04	0.96	< 0.02	0.02	< 0.02	0.04	0.16	0.16	**1.4**
Biphenyl	52	µg/g	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.06
Chrysene	9.6	µg/g	0.1	2	< 0.02	0.06	< 0.02	0.1	0.26	0.28	2.4
Dibenzo[a,h]anthracene	0.1	µg/g	0.02	**0.28**	< 0.02	< 0.02	< 0.02	0.02	0.04	0.02	**0.48**
Fluoranthene	9.6	µg/g	0.12	4.1	< 0.02	0.1	< 0.02	0.12	0.44	0.4	6.6
Fluorene	62	µg/g	< 0.02	0.24	< 0.02	< 0.02	< 0.02	< 0.02	0.04	0.02	0.78
Hexachlorobenzene	0.66	µg/g	-	-	-	-	-	-	-	-	
Hexachlorobutadiene	0.031	µg/g	-	-	-	-	-	-	-	-	
Indeno[1,2,3-cd]pyrene	0.76	µg/g	0.06	0.2	< 0.02	0.02	< 0.02	0.02	0.1	0.12	**1.4**
Naphthalene	9.6	µg/g	0.06	0.08	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	1.1
Phenanthrene	12	µg/g	0.08	3	< 0.02	0.14	< 0.02	0.1	0.42	0.38	8
Pyrene	96	µg/g	0.12	3.6	< 0.02	0.06	< 0.02	0.1	0.34	0.36	5
Styrene	34	µg/g	-	< 0.002	-	-	-	-	-	-	
Methylnaphthalenes	-	µg/g	-	-	-	-	-	-	-	-	
Benzo(a)pyrene Total Potency Equivalence (TPE)	-	µg/g	-	-	-	-	-	-	-	-	

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition

< Indicates parameter was below laboratory equipment detection limit.

- Chemical not analyzed or criteria not defined.

Bold and italicised Detection limit above MECP Table 7 Standards

Bold and shaded Exceeding MECP Table 7 Standards

Table D4
Historical PAHs in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	SS-1	SS-2	SS-3	SS-4	SS-5	MW17-01		MW17-02
		Sample Name	SS-1	SS-2	SS-3	SS-4	SS-5	MW17-01-SS01	DUP-20170728-D	MW17-02-SS01
		Sample Date	2005-05-31	2005-05-31	2005-05-31	2005-05-31	2005-05-31	2017-07-28	2017-07-28	2017-07-28
		Sample Depth	0-0.15 m	0-0.15 m	0-0.15 m	0-0.15 m	0-0.15 m	0-1.52 m	0-1.52 m	0-1.52 m
		Historical Report	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**								
1-Methylnaphthalene	76	µg/g	< 0.02	0.02	< 0.02	0.06	< 0.02	< 0.005	< 0.005	0.048
2-Methylnaphthalene	76	µg/g	< 0.02	0.02	< 0.02	0.06	< 0.02	< 0.005	< 0.005	0.085
4-Methyl-2-pentanone	31	µg/g						< 0.5	< 0.5	< 0.5
Acenaphthene	96	µg/g	0.4	0.04	0.04	0.2	< 0.02	< 0.005	< 0.005	0.12
Acenaphthylene	0.15	µg/g	< 0.02	0.04	< 0.02	0.12	< 0.02	< 0.005	< 0.005	0.0082
Anthracene	0.67	µg/g	**2.4**	0.12	0.1	0.48	< 0.02	< 0.005	< 0.005	0.25
Benzo [b,j] fluoranthene	-	µg/g						< 0.005	0.0098	0.32
Benzo[a]anthracene	0.96	µg/g	**5.6**	0.3	0.3	0.92	< 0.02	< 0.005	0.0068	0.36
Benzo[a]pyrene	0.3	µg/g	**4.2**	0.24	0.24	**0.78**	< 0.02	< 0.005	0.0057	0.27
Benzo[b]fluoranthene	0.96	µg/g	**6.6**	0.34	0.36	0.92	< 0.02	-	-	-
Benzo[g,h,i]perylene	9.6	µg/g	2.2	0.22	0.22	0.68	< 0.02	< 0.005	0.0051	0.13
Benzo[k]fluoranthene	0.96	µg/g	**3.6**	0.14	0.14	0.3	< 0.02	< 0.005	< 0.005	0.13
Biphenyl	52	µg/g	< 0.02	< 0.02	< 0.02	0.02	< 0.02	-	-	-
Chrysene	9.6	µg/g	4.6	0.22	0.24	0.68	< 0.02	< 0.005	0.01	0.29
Dibenzo[a,h]anthracene	0.1	µg/g	**0.4**	0.06	0.06	**0.16**	< 0.02	< 0.005	< 0.005	0.043
Fluoranthene	9.6	µg/g	**14**	0.6	0.66	2	< 0.02	< 0.005	0.013	0.69
Fluorene	62	µg/g	1	0.04	0.04	0.18	< 0.02	< 0.005	< 0.005	0.15
Hexachlorobenzene	0.66	µg/g						-	-	< 0.002
Hexachlorobutadiene	0.031	µg/g						-	-	< 0.002
Indeno[1,2,3-cd]pyrene	0.76	µg/g	**2**	0.16	0.2	0.52	< 0.02	< 0.005	< 0.005	0.15
Naphthalene	9.6	µg/g	0.4	0.06	< 0.02	0.1	< 0.02	< 0.005	< 0.005	0.27
Phenanthrene	12	µg/g	11	0.48	0.42	2.4	< 0.02	0.012	0.016	0.88
Pyrene	96	µg/g	11	0.48	0.52	2.4	< 0.02	0.0067	0.014	0.59
Styrene	34	µg/g						< 0.05	< 0.05	< 0.05
Methylnaphthalenes	-	µg/g						< 0.0071	< 0.0071	0.13
Benzo(a)pyrene Total Potency Equivalence (TPE)	-	µg/g						0.006	0.011	0.413

Notes:
O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment de
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MEC
Bold and shaded Exceeding MECP Table 7

Table D5
Historical Metals in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	03-BH2/MW2	03-BH3	03-BH4/MW4	SS-1	SS-2	SS-3	SS-4	SS-5	BH7 (Paterson)	MW17-01		MW17-02
		Sample Name	BH2-2	BH3-2	BH4-1	SS-1	SS-2	SS-3	SS-4	SS-5	BH7 SS3	MW17-01-SS01	DUP-20170728-D	MW17-02-SS01
		Sample Date	2003-10-28	2003-10-28	2003-10-28	2005-05-31	2005-05-31	2005-05-31	2005-05-31	2005-05-31	2017-07-28	2017-07-28	2017-07-28	2017-07-28
		Sample Depth	0.8-1.4 m	0.8-1.4 m	0-0.6 m	0-0.15 m	0-0.15 m	0-0.15 m	0-0.15 m	0-0.15 m	1.1-1.8 m	0-1.52 m	0-1.52 m	0-1.52 m
		Historical Report	Intera, January 2004, Ph I/II	Intera, January 2004, Ph I/II	Intera, January 2004, Ph I/II	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Intera, October 2005, Risk Assess.	Paterson, 8 September 2017	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**												
Antimony	40	µg/g	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2
Arsenic	18	µg/g	2	4	7	3	3	2	2	1	< 1	9.1	9.4	1.4
Barium	670	µg/g	70	160	10	50	40	40	40	40	111	33	34	130
Beryllium	8	µg/g	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.25	0.24	0.41
Boron	120	µg/g	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6.7	0.2	0.19	0.21
Cadmium	1.9	µg/g	< 1	< 1	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.1
Calcium	-	µg/g	36000	66000	190000	7200	3600	4400	7200	3200	-	-	-	-
Chromium	160	µg/g	20	30	10	15	15	15	15	15	17.2	13	15	23
Hexavalent Chromium	8	µg/g	< 6	< 6	< 6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	< 0.2	< 0.2	1
Cobalt	80	µg/g	< 5	10	10	< 5	< 5	< 5	< 5	< 5	5.9	8.6	8	7
Copper	230	µg/g	10	10	10	10	10	5	10	5	15.2	11	12	16
Lead	120	µg/g	40	15	25	30	16	11	16	11	15.1	29	29	20
Magnesium	-	µg/g	8000	11000	97000	4400	2200	2600	3200	2400	-	-	-	-
Mercury	3.9	µg/g	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.05	< 0.05	< 0.05
Molybdenum	40	µg/g	< 1	2	7	< 1	< 1	< 1	< 1	< 1	< 1	8	8	0.51
Nickel	270	µg/g	10	25	20	10	10	10	10	10	12.6	17	16	16
Selenium	5.5	µg/g	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.5	< 0.5	< 0.5
Silver	40	µg/g	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2
Sodium	-	µg/g	< 200	400	< 200	< 200	< 200	< 200	< 200	< 200	-	-	-	-
Sulfur	-	µg/g	-	-	-	-	-	-	-	-	-	2700	2700	590
Thallium	3.3	µg/g	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.29	0.28	0.21
Tin	-	µg/g	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	-	< 1	< 1	1.3
Uranium	33	µg/g	-	-	-	-	-	-	-	-	< 1	0.8	0.77	0.63
Vanadium	86	µg/g	20	30	10	20	20	20	20	20	24.4	13	13	32
Zinc	340	µg/g	60	40	< 20	60	40	40	40	40	42	28	33	44
Iron	-	µg/g	14000	24000	9000	10000	9400	9400	10000	10000	-	-	-	-

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D6
Historical Phenols in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW17-01		MW17-02
Sample Name			MW17-01-SS01	DUP-20170728-D (Field Duplicate of MW17-01-SS01)	MW17-02-SS01
Sample Date			2017-07-28	2017-07-28	2017-07-28
Sample Depth			0-1.52 m	0-1.52 m	0-1.52 m
Historical Report			Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**			
2,3,4,5-Tetrachlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,3,4,6-Tetrachlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,3,4-Trichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,3,5,6-Tetrachlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,3,5-Trichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,3,6-Trichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,3-Dichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	10	µg/g	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	3.8	µg/g	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	3.4	µg/g	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	390	µg/g	< 0.1	< 0.1	< 0.1
2,4-Dinitrophenol	59	µg/g	< 0.1	< 0.1	< 0.1
2,5-Dichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2,6-Dichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
2-Chlorophenol	3.1	µg/g	< 0.05	< 0.05	< 0.05
2-Methylphenol	-	µg/g	< 0.1	< 0.1	< 0.1
2-Nitrophenol	-	µg/g	< 0.1	< 0.1	< 0.1
3,4,5-Trichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
3,4-Dichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
3,5-Dichlorophenol	-	µg/g	< 0.05	< 0.05	< 0.05
4,6-Dinitro-2-methylphenol	-	µg/g	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	-	µg/g	< 0.1	< 0.1	< 0.1
4-Nitrophenol	-	µg/g	< 0.1	< 0.1	< 0.1
Pentachlorophenol	2.9	µg/g	< 0.05	< 0.05	< 0.05
Phenol	9.4	µg/g	< 0.1	< 0.1	< 0.1
3-, 4-Methylphenol (total)	-	µg/g	< 0.1	< 0.1	< 0.1
3-, 4-Chlorophenol (total)	-	µg/g	< 0.05	< 0.05	< 0.05

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D7
Historical Pesticides in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**MW17-02**
		Sample Name	**MW17-02-SS01**
		Sample Date	**2017-07-28**
		Sample Depth	**0-1.52 m**
		Historical Report	**Stantec, 7 September 2017, Ph II**
Parameter	**MECP Table 7 Standards[1]**	**Unit**	
4,4-DDD	-	µg/g	< 0.002
4,4-DDE	-	µg/g	< 0.002
4,4-DDT	-	µg/g	< 0.002
Aldrin	0.088	µg/g	< 0.002
alpha-Chlordane	-	µg/g	< 0.002
Chlordane	0.05	µg/g	< 0.002
Dieldrin	0.088	µg/g	< 0.002
Endosulfan	0.3	µg/g	< 0.002
Endrin	0.04	µg/g	< 0.002
gamma-hexachlorocyclohexane	-	µg/g	< 0.002
Heptachlor	0.19	µg/g	< 0.002
Heptachlor Epoxide	0.05	µg/g	< 0.002
Methoxychlor	1.6	µg/g	< 0.005
o,p'-DDD	-	µg/g	< 0.002
o,p'-DDE	-	µg/g	< 0.002
o,p'-DDT	-	µg/g	< 0.002
DDD, Total	4.6	µg/g	< 0.002
DDT, Total	1.4	µg/g	< 0.002
gamma-Chlordane	-	µg/g	< 0.002
13C9-Endosulfan I	-	µg/g	< 0.002
13C9-Endosulfan II	-	µg/g	< 0.002
DDE, Total	-	µg/g	< 0.002

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D8
Historical Polychlorinated Biphenyls in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW17-01		MW17-02
Sample Name			MW17-01-SS01	DUP-20170728-D	MW17-02-SS01
Sample Date			2017-07-28	2017-07-28	2017-07-28
Sample Depth			0-1.52 m	0-1.52 m	0-1.52 m
Historical Report			Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**			
Aroclor 1242	-	µg/g	< 0.01	< 0.01	< 0.015
Aroclor 1248	-	µg/g	< 0.01	< 0.01	< 0.015
Aroclor 1254	-	µg/g	< 0.01	< 0.01	< 0.015
Aroclor 1260	-	µg/g	< 0.01	< 0.01	< 0.015
Polychlorinated Biphenyls	1.1	µg/g	< 0.01	< 0.01	< 0.015

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D9
Historical Dioxins and Furans in Soil Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			**MW17-01**	
Sample Name			**MW17-01-SS01**	**DUP-20170728-D**
Sample Date			**2017-07-28**	**2017-07-28**
Sample Depth			**0-1.52 m**	**0-1.52 m**
Historical Report			**Stantec, 7 September 2017, Ph II**	**Stantec, 7 September 2017, Ph II**
Parameter	**MECP Table 7 Standards[1]**	**Unit**		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	-	pg/g	8.5	5.56
1,2,3,4,7,8,9-Heptachlorodibenzofuran	-	pg/g	0.253	0.151
1,2,3,4,7,8-Hexachlorodibenzofuran	-	pg/g	0.111	< 0.105
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	-	pg/g	< 0.0982	< 0.105
1,2,3,6,7,8-Hexachlorodibenzofuran	-	pg/g	< 0.0944	< 0.101
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	-	pg/g	< 0.307	0.234
1,2,3,7,8,9-Hexachlorodibenzofuran	-	pg/g	0.151	< 0.122
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	-	pg/g	0.237	< 0.119
1,2,3,7,8-Pentachlorodibenzofuran	-	pg/g	< 0.104	< 0.104
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	-	pg/g	< 0.102	< 0.103
2,3,4,6,7,8-Hexachlorodibenzofuran	-	pg/g	0.133	< 0.11
2,3,4,7,8-Pentachlorodibenzofuran	-	pg/g	< 0.107	< 0.107
2,3,7,8-Tetrachlorodibenzofuran	-	pg/g	< 0.104	< 0.105
2,3,7,8-Tetrachlorodibenzo-p-dioxin	-	pg/g	< 0.105	< 0.103
Octachlorodibenzofuran	-	pg/g	6.6	4.48
Octachlorodibenzo-p-dioxin	-	pg/g	93.4	56.6
1,2,3,4,6,7,8-Heptachlorodibenzofuran	-	pg/g	2.74	2.16
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin - toxicity equivalence	-	pg/g	16	10.2
1,2,3,7,8-Pentachlorodibenzo-p-dioxin - toxicity equivalence	-	pg/g	< 0.102	< 0.103
1,2,3,7,8-Pentachlorodibenzofuran - toxicity equivalence factor	-	pg/g	0.172	0.386
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin - toxicity equivalence	-	pg/g	1.11	0.915
1,2,3,4,6,7,8-Heptachlorodibenzofuran - toxicity equivalence	-	pg/g	8.43	6.53
1,2,3,7,8,9-Hexachlorodibenzofuran - toxicity equivalence factor	-	pg/g	2.64	1.71
13C-2,3,7,8-Tetrachlorodibenzo-p-dioxin - toxicity equivalence	-	pg/g	< 0.105	< 0.103
Tetrachlorodibenzofuran	-	pg/g	< 0.209	< 0.169
TEQ Total Dioxin/Furan (WHO,ND=DL)	-	pg/g	0.511	0.438

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for industrial/commercial/community property use for coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition
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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D10
Historical General Chemistry in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			BH2/MW2	BH4/MW4			BH5	MW17-01		MW17-02
Sample Name			MW2	MW4	MW4 DUP (Field duplicate of MW4)	MW4	MW5	MW17-01	DUP-20170801-D	MW17-02
Sample Date			2017-08-02	2003-11-06	2003-11-06	2017-08-03	2003-11-06	2017-08-01	2017-08-01	2017-07-31
Historical Report			Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**								
Alkalinity (Total as CaCO3)	-	µg/L	-	480000	470000	-	600000	-	-	-
Ammonia Nitrogen	-	mg/L	1.6	-	-	2.5	-	0.15	0.14	0.32
Bromide	-	µg/L	-	< 100	< 100	-	600	-	-	-
Chloride	1800000	µg/L	1600000	1200000	1200000	**3000000**	1800000	1300000	1200000	13000
Cyanide (free)	0.052	mg/L	0.0013	-	-	< 0.001	-	0.0081	0.008	< 0.001
Conductivity	-	uS/cm	-	5100	5100	-	7400	-	-	-
Fluoride	-	µg/L	250	< 50	< 50	150	< 50	620	580	190
Hardness, Calcium Carbonate	-	mg/L	-	1800	1800	1930	1400	116	113	744
Nitrogen, Nitrate-Nitrite	-	mg/L	-	-	-	0.2	-	1.59	1.63	0.16
pH	-	-	-	7.88	6.9	7.11	7.18	8.01	8.07	7.54
Phosphate	-	µg/L	-	< 500	< 500	-	< 500	-	-	-
Sulphate	-	µg/L	740000	1100000	1100000	420000	1700000	450000	390000	330000
Sulfide	-	mg/L	0.0093	-	-	0.012	-	< 0.0019	< 0.0019	< 0.0019
Nitrate as N	-	µg/L	-	4900	5000	190	200	1550	1590	160
Nitrite as N	-	µg/L	-	< 50	< 50	12	< 50	42	44	<10
Sulfide (as H2S)	-	mg/L	0.01	-	-	0.012	-	< 0.002	< 0.002	< 0.002

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D11
Historical Petroleum Hydrocarbons in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW2	BH4		BH5	BH7	MW17-01		MW17-02
Sample Name			MW2	MW4		MW5	BH7 GW1	MW17-01	DUP-20170801-D (Field duplicate of MW17-01)	MW17-02
Sample Date			2017-08-02	2003-11-06	2017-08-03	2003-11-06	2017-08-09	2017-08-01	2017-08-01	2017-07-31
Historical Report			Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Paterson, 8 September 2017	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards[1]**	**Unit**								
PHC - F1 (C6-C10)	420	µg/L	< 25	-	< 25	-	< 25	< 25	< 25	< 25
PHC - F1 (C6-C10)-BTEX	420	µg/L	< 25	-	< 25	-	-	< 25	< 25	< 25
PHC - F2 (C10-C16)	150	µg/L	< 100	-	< 100	-	< 100	< 100	< 100	< 100
PHC - F2 (C10-C16) less Naphthalene	-	µg/L	-	-	-	-	-	-	-	-
PHC - F3 (C16-C34)	500	µg/L	< 200	-	< 200	-	< 100	< 200	< 200	< 200
PHC - F3 (C16-C34) less PAHs	-	µg/L	-	-	-	-	-	-	-	-
PHC - F4 (C34-C50)	500	µg/L	< 200	-	< 200	-	< 100	< 200	< 200	< 200
Benzene	0.5	µg/L	< 0.1	< 0.5	0.27	-	< 0.5	< 0.2	< 0.2	< 0.1
Toluene	320	µg/L	< 0.2	< 0.5	< 0.2	-	< 0.5	< 0.4	< 0.4	0.64
Ethylbenzene	54	µg/L	< 0.1	< 0.5	< 0.1	-	< 0.5	< 0.2	< 0.2	< 0.1
o-Xylene	-	µg/L	< 0.1	< 0.5	< 0.1	-	-	< 0.2	< 0.2	< 0.1
m,p-Xylenes	-	µg/L	< 0.1	< 1	< 0.1	-	-	< 0.2	< 0.2	0.1
Xylenes, Total	72	µg/L	< 0.1	< 0.5	< 0.1	-	< 0.5	< 0.2	< 0.2	0.1
TPH-Diesel	-	µg/L	-	-	-	< 100	-	-	-	-
TPH-Heavy Oils	-	µg/L	-	-	-	< 500	-	-	-	-
TPH as Gasoline	-	µg/L	-	-	-	< 200	-	-	-	-

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D12
Historical VOCs in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW2	BH4/MW4		BH7	MW17-01		MW17-02
Sample Name			MW2	MW4	MW4	BH7 GW1	MW17-01	DUP-20170801-D (Field duplicate of MW17-01)	MW17-02
Sample Date			2017-08-02	2003-11-06	2017-08-03	2017-08-09	2017-08-01	2017-08-01	2017-07-31
Historical Report			Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Paterson, 8 September 2017	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	MECP Table 7 Standards[1]	Unit							
1,1,1,2-Tetrachloroethane	1.1	µg/L	< 0.2	< 0.5	< 0.2	-	< 0.4	< 0.4	< 0.2
1,1,1-Trichloroethane	23	µg/L	< 0.1	< 0.4	< 0.1	-	< 0.2	< 0.2	< 0.1
1,1,2,2-Tetrachloroethane	0.5	µg/L	< 0.2	***< 0.6***	< 0.2	-	< 0.4	< 0.4	< 0.2
1,1,2-Trichloroethane	0.5	µg/L	< 0.2	***< 0.6***	< 0.2	-	< 0.4	< 0.4	< 0.2
1,1-Dichloroethane	11	µg/L	< 0.1	< 0.5	< 0.1	-	< 0.2	< 0.2	< 0.1
1,1-Dichloroethylene	0.5	µg/L	< 0.1	***< 0.6***	< 0.1	-	< 0.2	< 0.2	< 0.1
1,2-DibroMECPthane	0.2	µg/L	< 0.2	***< 1***	< 0.2	-	***< 0.4***	***< 0.4***	< 0.2
1,2-Dichlorobenzene	150	µg/L	< 0.2	< 0.4	< 0.2	-	< 0.4	< 0.4	< 0.2
1,2-Dichloroethane	0.5	µg/L	< 0.2	< 0.5	< 0.2	-	< 0.4	< 0.4	< 0.2
1,2-Dichloropropane	0.58	µg/L	< 0.1	***< 0.7***	< 0.1	-	< 0.2	< 0.2	< 0.1
1,3,5-Trimethylbenzene	-	µg/L	-	< 0.5	-	-	-	-	-
1,3-Dichlorobenzene	7600	µg/L	< 0.2	< 0.4	< 0.2	-	< 0.4	< 0.4	< 0.2
1,3-Dichloropropene, Total	0.5	µg/L	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.5	µg/L	< 0.2	< 0.4	< 0.2	-	< 0.4	< 0.4	< 0.2
Methyl Ethyl Ketone	21000	µg/L	< 5	-	< 5	-	< 10	< 10	< 5
Acetone	100000	µg/L	< 10	-	< 10	-	< 20	< 20	< 10
Bromodichloromethane	67000	µg/L	< 0.1	< 0.4	< 0.1	-	< 0.2	< 0.2	< 0.1
Bromoform	5	µg/L	< 0.2	< 0.8	< 0.2	-	< 0.4	< 0.4	< 0.2
Bromomethane	0.89	µg/L	< 0.5	***< 1***	< 0.5	-	***< 1***	***< 1***	< 0.5
Carbon Tetrachloride	0.2	µg/L	< 0.1	***< 0.5***	< 0.1	-	< 0.2	< 0.2	< 0.1
Chlorobenzene	140	µg/L	< 0.1	< 0.4	< 0.1	-	< 0.2	< 0.2	< 0.1
Chloroethane	-	µg/L	-	< 1	-	-	-	-	-
Chloroform	2	µg/L	< 0.1	< 0.6	< 0.1	-	1.5	1.5	0.98
Chloromethane	-	µg/L	-	< 3	-	-	-	-	-
cis-1,2-Dichloroethene	1.6	µg/L	< 0.1	< 0.4	< 0.1	-	< 0.2	< 0.2	< 0.1
cis-1,3-Dichloropropene	-	µg/L	< 0.2	< 0.4	< 0.2	-	< 0.4	< 0.4	< 0.2
Dibromochloromethane	65000	µg/L	< 0.2	< 0.5	< 0.2	-	< 0.4	< 0.4	< 0.2
Dichlorodifluoromethane	3500	µg/L	< 0.5	-	< 0.5	-	< 1	< 1	< 0.5
Ethylbenzene	54	µg/L	< 0.1	< 0.5	< 0.1	< 0.5	< 0.2	< 0.2	< 0.1
Hexachloroethane	0.17	µg/L	-	-	-	-	-	-	< 0.01
Methyl tert-Butyl Ether	15	µg/L	< 0.2	-	< 0.2	-	< 0.4	< 0.4	< 0.2
Methylene Chloride	26	µg/L	< 0.5	< 4	< 0.5	-	< 1	< 1	< 0.5
n-Hexane	5	µg/L	< 0.5	-	< 0.5	-	< 1	< 1	< 0.5
Tetrachloroethylene	0.5	µg/L	< 0.1	< 0.5	< 0.1	-	< 0.2	< 0.2	< 0.1
trans-1,2-Dichloroethene	1.6	µg/L	< 0.1	< 1	< 0.1	-	< 0.2	< 0.2	< 0.1
trans-1,3-Dichloropropene	-	µg/L	< 0.2	< 0.5	< 0.2	-	< 0.4	< 0.4	< 0.2
Trichloroethene	0.5	µg/L	< 0.1	< 0.4	< 0.1	-	< 0.2	< 0.2	< 0.1
Trichlorofluoromethane	2000	µg/L	< 0.2	< 1	< 0.2	-	< 0.4	< 0.4	< 0.2
Vinyl Chloride	0.5	µg/L	< 0.2	< 0.5	< 0.2	-	< 0.4	< 0.4	< 0.2
Styrene	43	µg/L	< 0.2	< 0.4	< 0.2	-	< 0.4	< 0.4	< 0.2
Methyl Isobutyl Ketone	5200	µg/L	< 5	-	< 5	-	< 10	< 10	< 5

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D13
Historical PAHs in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			BH7 (Paterson)	MW2	MW4			MW5		MW17-01		MW17-02
Sample Name			BH7 GW1	MW2	MW4	03-MW4	MW4	03-MW5	03-MW5	MW17-01	DUP-20170801-D (Field duplicate of MW17-01)	MW17-02
Sample Date			2017-08-09	2017-08-02	2003-11-06	2005-06-01	2017-08-03	2003-11-06	2005-06-01	2017-08-01	2017-08-01	2017-07-31
Historical Report			Paterson, 8 September 2017	Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Intera, October 2005, Risk Asses.	Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Intera, October 2005, Risk Asses.	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards1**	**Unit**										
1-Methylnaphthalene	1500	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
2-Methylnaphthalene	1500	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
4-Methyl-2-pentanone	5200	µg/L	-	< 5	-	-	< 5	-	-	< 10	< 10	< 5
Acenaphthene	17	µg/L	0.14	< 0.01	-	< 0.05	< 0.01	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
Acenaphthylene	1	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
Anthracene	1	µg/L	< 0.01	< 0.01	-	< 0.01	< 0.01	0.06	< 0.01	< 0.01	< 0.01	< 0.01
Benzo [b,j] fluoranthene	-	µg/L	-	< 0.01	-	-	< 0.01	-	-	< 0.01	< 0.01	< 0.01
Benzo[a]anthracene	1.8	µg/L	0.02	< 0.01	-	< 0.01	< 0.01	0.17	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[a]pyrene	0.81	µg/L	< 0.01	< 0.01	-	< 0.01	< 0.01	0.1	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[b]fluoranthene	0.75	µg/L	< 0.05	-	-	< 0.05	-	0.16	< 0.05	-	-	-
Benzo[g,h,i]perylene	0.2	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	0.11	< 0.05	< 0.01	< 0.01	< 0.01
Benzo[k]fluoranthene	0.4	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	0.11	< 0.05	< 0.01	< 0.01	< 0.01
Biphenyl	1000	µg/L	-	-	-	< 0.05	-	< 0.05	< 0.05	-	-	-
Chrysene	0.7	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	0.22	< 0.05	< 0.01	< 0.01	< 0.01
Dibenzo[a,h]anthracene	0.4	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01
Fluoranthene	44	µg/L	0.08	< 0.01	-	< 0.01	< 0.01	0.36	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	290	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	0.05	< 0.05	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	3.1	µg/L	-	-	-	-	-	-	-	-	-	< 0.005
Hexachlorobutadiene	0.012	µg/L	-	-	-	-	-	-	-	-	-	< 0.009
Indeno[1,2,3-cd]pyrene	0.2	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	0.11	< 0.05	< 0.01	< 0.01	< 0.01
Naphthalene	7	µg/L	< 0.05	0.012	-	< 0.05	< 0.01	2.1	1.3	0.013	0.013	0.012
Phenanthrene	380	µg/L	< 0.05	< 0.01	-	< 0.05	< 0.01	0.22	< 0.05	< 0.01	< 0.01	< 0.01
Pyrene	5.7	µg/L	0.05	< 0.01	-	< 0.01	< 0.01	0.35	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	43	µg/L	-	< 0.2	< 0.4	-	< 0.2	-	-	< 0.4	< 0.4	< 0.2
1- & 2-Methylnaphthalene	-	µg/L	-	-	-	-	-	-	-	-	-	-

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D14
Historical Metals in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW2		BH4/MW4			MW5	MW17-01		MW17-02
Sample Name			03-MW2	MW2	MW4	MW4 DUP (Field duplicate of MW4)	MW4	MW5	MW17-01	DUP-20170801-D (Field duplicate of MW17-01)	MW17-02
Sample Date			2005-06-01	2017-08-02	2003-11-06	2003-11-06	2017-08-03	2003-11-06	2017-08-01	2017-08-01	2017-07-31
Historical Report			Intera, October 2005, Risk Asses.	Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Intera, January 2004, Ph I/II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	MECP Table 7 Standards1	Unit									
Aluminum	-	µg/L	<10	< 5	40	20	6.3	30	10.1	10.5	2.85
Antimony	16000	µg/L	4.00	< 0.2	< 1	< 1	< 0.2	3	1.44	1.47	0.665
Arsenic	1500	µg/L	<10	5.39	< 10	< 10	7.44	< 10	1.1	1.14	5.34
Barium	23000	µg/L	50	42.5	70	80	72.3	70	547	556	98.4
Beryllium	53	µg/L	<1	< 0.1	< 1	< 1	< 0.1	< 1	< 0.1	< 0.1	< 0.01
Bismuth	-	µg/L	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.005
Boron	36000	µg/L	55	394	200	200	237	250	< 100	< 100	136
Cadmium	2.1	µg/L	<1	< 0.05	< 1	< 1	< 0.05	< 1	< 0.05	< 0.05	0.007
Calcium	-	µg/L	300000	395000	530000	550000	569000	450000	35400	34400	227000
Chromium	640	µg/L	<50	< 1	< 50	< 50	< 1	< 50	< 1	< 1	< 0.1
Hexavalent Chromium	110	µg/L	<10	-	-	-	-	-	-	-	-
Cobalt	52	µg/L	10	0.144	10	10	0.406	30	0.557	0.524	0.591
Copper	69	µg/L	15	< 0.5	10	10	0.89	10	6.24	6.4	1.02
Lead	20	µg/L	<1	0.052	< 5	< 5	0.074	< 5	< 0.05	< 0.05	0.014
Lithium	-	µg/L	-	88.1	-	-	86.8	-	6.9	6.8	13.8
Magnesium	-	µg/L	95000	111000	110000	110000	124000	84000	6710	6650	43200
Manganese	-	µg/L	150	86	350	350	85.8	200	2.48	2.5	80.9
Mercury	0.1	µg/L	<0.1	< 0.01	-	-	< 0.01	-	< 0.01	< 0.01	< 0.01
Molybdenum	7300	µg/L	15	5.27	< 5	< 5	1.31	25	126	123	4.05
Nickel	390	µg/L	40	1.74	35	35	2.69	60	1.93	2.13	3.08
Potassium	-	µg/L	19000	19500	11000	11000	17500	23000	8020	8130	10700
Selenium	50	µg/L	5	< 0.4	< 5	< 5	0.53	< 5	1.09	1.09	0.18
Silicon	-	µg/L	-	7800	-	-	7260	-	6600	6330	6610
Silver	1.2	µg/L	<1	< 0.05	< 1	< 1	< 0.05	< 1	< 0.05	< 0.05	0.005
Sodium	1800000	µg/L	920000	905000	620000	570000	1200000	1100000	1260000	1260000	30100
Strontium	-	µg/L	-	16100	-	-	13600	-	930	904	5410
Sulfur	-	mg/L	-	275	-	-	157	-	142	142	127
Thallium	400	µg/L	<1	< 0.02	< 1	< 1	< 0.02	< 1	0.094	0.091	0.013
Tin	-	µg/L	<10	< 2	< 5	< 5	< 2	< 5	< 2	< 2	0.4
Titanium	-	µg/L	-	< 5	-	-	< 5	-	< 5	< 5	< 0.5
Uranium	330	µg/L	-	3.15	-	-	5.47	-	8.92	9.11	5.26
Vanadium	200	µg/L	<10	< 2	< 10	< 10	< 2	< 10	< 2	< 2	0.54
Zinc	890	µg/L	20	5.8	80	80	18.8	80	2.3	2.7	5.79
Zirconium	-	µg/L	-	< 1	-	-	< 1	-	< 1	< 1	0.37
Iron	-	µg/L	1000	9740	< 200	< 200	5530	< 200	19	17	1210

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
< Indicates parameter was below laboratory equipment detection limit.
- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D15
Historical Phenols in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW2	MW4	MW17-01		MW17-02	
Sample Name			MW2	MW4	MW17-01	DUP-20170801-D (Field duplicate of MW17-01)	MW17-02	DUP-20170731-C (Field duplicate of MW17-02)
Sample Date			2017-08-02	2017-08-03	2017-08-01	2017-08-01	2017-07-31	2017-07-31
Historical Report			Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards1**	**Unit**						
2,3,4,5-Tetrachlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,3,4-Trichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,3,5-Trichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,3,6-Trichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,3-Dichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	1300	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	180	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	3700	µg/L	< 0.1	< 0.1	< 0.3	0.1	< 0.1	< 0.1
2,4-Dimethylphenol	31000	µg/L	< 1	< 1	< 3	< 1	< 1	< 1
2,4-Dinitrophenol	9000	µg/L	< 1	< 1	< 3	< 1	< 1	< 1
2,5-Dichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2,6-Dichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2-Chlorophenol	2600	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
2-Methylphenol	-	µg/L	< 0.5	< 0.5	< 1.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	-	µg/L	< 1	< 1	< 3	< 1	< 1	< 1
3,4,5-Trichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
3,4-Dichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
3,5-Dichlorophenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
4,6-Dinitro-2-methylphenol	-	µg/L	< 1	< 1	< 3	< 1	< 1	< 1
4-Chloro-3-methylphenol	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
4-Nitrophenol	-	µg/L	< 1	< 1	< 3	< 1	< 1	< 1
Pentachlorophenol	50	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
Phenol	9600	µg/L	< 0.5	< 0.5	< 1.5	< 0.5	< 0.5	< 0.5
3-, 4-Methylphenol (total)	-	µg/L	< 0.5	< 0.5	< 1.5	< 0.5	< 0.5	< 0.5
3-, 4-Chlorophenol (total)	-	µg/L	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.

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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D16
Historical Metals in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**MW17-02**
		Sample Name	**MW17-02**
		Sample Date	**2017-07-31**
		Historical Report	**Stantec, 7 September 2017, Ph II**
Parameter	**MECP Table 7 Standards1**	**Unit**	
4,4-DDD	-	µg/L	< 0.005
4,4-DDE	-	µg/L	< 0.005
4,4-DDT	-	µg/L	< 0.005
Aldrin	3	µg/L	< 0.005
alpha-Chlordane	-	µg/L	< 0.005
Chlordane	0.06	µg/L	< 0.005
Dieldrin	0.56	µg/L	< 0.005
Endosulfan	0.56	µg/L	< 0.005
Endrin	0.36	µg/L	< 0.005
gamma-hexachlorocyclohexane	-	µg/L	< 0.003
Heptachlor	0.038	µg/L	< 0.005
Heptachlor Epoxide	0.038	µg/L	< 0.005
Methoxychlor	0.3	µg/L	< 0.01
o,p'-DDD	-	µg/L	< 0.005
o,p'-DDE	-	µg/L	< 0.005
o,p'-DDT	-	µg/L	< 0.005
Toxaphene	-	µg/L	< 0.2
DDD, Total	1.8	µg/L	< 0.005
DDT, Total	0.05	µg/L	< 0.005
gamma-Chlordane	-	µg/L	< 0.005
DDT+ metabolites	-	µg/L	< 0.005
13C9-Endosulfan I	-	µg/L	< 0.005
13C9-Endosulfan II	-	µg/L	< 0.005
DDE, Total	-	µg/L	< 0.005

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D17
Historical PCBs in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

Location			MW2	MW4	MW17-01		MW17-02
Sample Name			MW2	MW4	MW17-01	DUP-20170801-D	MW17-02
Sample Date			2017-08-02	2017-08-03	2017-08-01	2017-08-01	2017-07-31
Historical Report			Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II	Stantec, 7 September 2017, Ph II
Parameter	**MECP Table 7 Standards1**	**Unit**					
Aroclor 1242	-	µg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1248	-	µg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1254	-	µg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1260	-	µg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Polychlorinated Biphenyls	0.2	µg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Notes:

[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.
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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

Table D18
Historical Dioxins and Furans in Groundwater Samples
Phase Two Environmental Site Assessment
New Civic Development for The Ottawa Hospital - Parkade

		Location	**MW2**	**MW4**	**MW17-01**	
		Sample Name	**MW2**	**MW4**	**MW17-01**	**DUP-20170801-D**
		Sample Date	**2017-08-02**	**2017-08-03**	**2017-08-01**	**2017-08-01**
		Historical Report	**Stantec, 7 September 2017, Ph II**	**Stantec, 7 September 2017, Ph II**	**Stantec, 7 September 2017, Ph II**	**Stantec, 7 September 2017, Ph II**
Parameter	**MECP Table 7 Standards1**	**Unit**				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	-	pg/l	< 1.14	1.38	< 1.19	< 1.16
1,2,3,4,7,8,9-Heptachlorodibenzofuran	-	pg/l	< 1.22	< 1.37	< 1.4	< 1.53
1,2,3,4,7,8-Hexachlorodibenzofuran	-	pg/l	< 0.98	< 0.784	< 1.08	< 1.18
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	-	pg/l	< 1.05	< 0.845	< 1.23	< 1.13
1,2,3,6,7,8-Hexachlorodibenzofuran	-	pg/l	< 0.951	0.777	< 1.05	< 1.15
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	-	pg/l	< 1.14	< 0.921	< 1.34	< 1.23
1,2,3,7,8,9-Hexachlorodibenzofuran	-	pg/l	< 1.15	< 1.07	< 1.26	< 1.38
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	-	pg/l	< 1.06	1.09	< 1.25	< 1.15
1,2,3,7,8-Pentachlorodibenzofuran	-	pg/l	< 1.22	1.24	< 1.16	< 1.14
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	-	pg/l	< 1.22	< 1.01	< 1.31	< 1.12
2,3,4,6,7,8-Hexachlorodibenzofuran	-	pg/l	< 1.03	1.21	< 1.13	< 1.24
2,3,4,7,8-Pentachlorodibenzofuran	-	pg/l	< 1.25	< 1.1	< 1.18	< 1.16
2,3,7,8-Tetrachlorodibenzofuran	-	pg/l	< 1.18	< 1.13	< 1.19	< 1.12
2,3,7,8-Tetrachlorodibenzo-p-dioxin	-	pg/l	< 1.25	< 1.07	< 1.19	< 1.2
Octachlorodibenzofuran	-	pg/l	< 1.1	2.79	1.86	1.17
Octachlorodibenzo-p-dioxin	-	pg/l	< 1.35	2.86	4.22	3.17
1,2,3,4,6,7,8-Heptachlorodibenzofuran	-	pg/l	< 0.912	1.04	< 1.05	< 1.15
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin - toxicity equivalence factor	-	pg/l	< 1.14	1.38	< 1.19	< 1.16
1,2,3,7,8-Pentachlorodibenzo-p-dioxin - toxicity equivalence factor	-	pg/l	< 1.22	< 1.01	< 1.31	< 1.12
1,2,3,7,8-Pentachlorodibenzofuran - toxicity equivalence factor	-	pg/l	< 1.23	1.24	< 1.17	< 1.15
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin - toxicity equivalence factor	-	pg/l	< 1.08	1.09	< 1.27	< 1.17
1,2,3,4,6,7,8-Heptachlorodibenzofuran - toxicity equivalence factor	-	pg/l	< 1.04	1.04	< 1.2	< 1.31
1,2,3,7,8,9-Hexachlorodibenzofuran - toxicity equivalence factor	-	pg/l	< 1.02	1.99	< 1.12	< 1.23
13C-2,3,7,8-Tetrachlorodibenzo-p-dioxin - toxicity equivalence factor	-	pg/l	< 1.25	< 1.07	< 1.19	< 1.2
Tetrachlorodibenzofuran	-	pg/l	< 1.18	< 1.13	< 1.19	< 1.12
Dioxins and Furans TEQ (CCME)	-	pg/l	3.77	3.27	3.88	3.7

Notes:
[1] O.Reg 153 (2011) Table 7 Standards for all types of property use for groundwater in coarse textured soil in generic site condition for shallow soils in a non-potable ground water condition.

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- Chemical not analyzed or criteria not defined.
Bold and italicised Detection limit above MECP Table 7 Standards
Bold and shaded Exceeding MECP Table 7 Standards

APPENDIX E

Historical Borehole Logs

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH1

Project Number: 03-217-15

Client: NCC

Site Location: Dow's Lake Landfill

Drilling Method: Hollow Stem Auger with Split Spoon

Date Completed: October 21, 2003

Supervisor: ADG

Ground Surface Elevation: Not surveyed

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation
0							TOPSOIL	
1			2 4 6 5	0	0		FILL Brown sand fill.	
2								
3 / 1			2 11 35 50	0	0		Cobbles with minor sand fill.	
4								
5			18 35 28 13	0	0			
6 / 2								
7								
8			3 10 50	0	0		SILTY SAND Brown silty sand with gravel. Iron staining, slightly moist.	
9							Borehole terminated on refusal (inferred bedrock) at 2.9 mBGS.	
10 / 3							BOREHOLE TERMINATED	
11								
12								
13 / 4								
14								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH2 (MW2)

Project Number: 03-217-15

Date Completed: October 28, 2003

Client: NCC

Supervisor: ADG

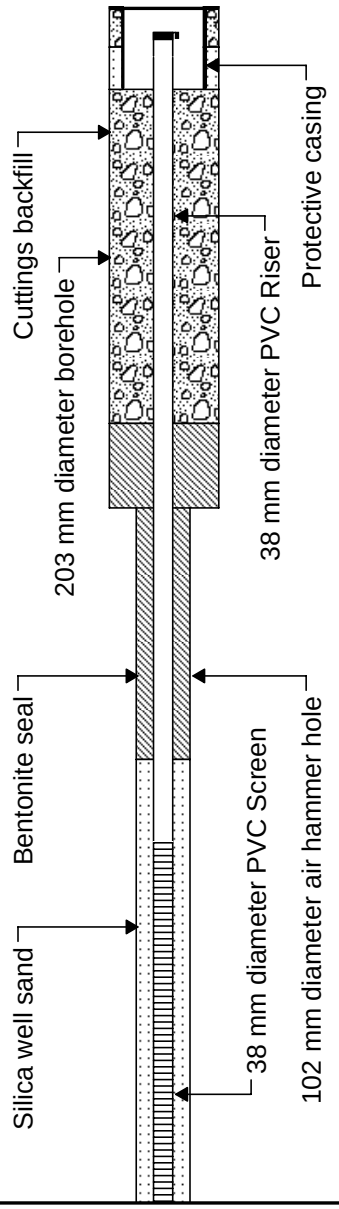
Site Location: Dow's Lake Landfill

Ground Surface Elevation: 100.25 mASD

Drilling Method: Hollow Stem Auger with Split Spoon and Bedrock Air Hammer

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION
0 / 0							GROUND SURFACE
0 / 0							TOPSOIL
1 / 0			4 5 7 13	0	0		FILL Brown sand and gravel fill.
2 / 0							Brown sand and gravel fill with cobbles and wood.
3 / 1		X		0	0		
4 / 1							
5 / 1		X		0			
6 / 2							LIMESTONE BEDROCK Black shaley limestone bedrock encountered at 1.8 mBGS.
7 / 2							
8 / 2							
9 / 2							
10 / 3							
11 / 3							
12 / 3							
13 / 4							
14 / 4							

INSTALLATION



BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH2 (MW2)

Project Number: 03-217-15

Date Completed: October 28, 2003

Client: NCC

Supervisor: ADG

Site Location: Dow's Lake Landfill

Ground Surface Elevation: 100.25 mASD

Drilling Method: Hollow Stem Auger with Split Spoon and Bedrock Air Hammer

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15								
16								
17	5							
18								
19								
20	6						Borehole terminated in bedrock at 6.1 mBGS.	Silica well sand
21							BOREHOLE TERMINATED	Depth of MW2 = 6.1 mBGS
22								
23	7							
24								
25								
26	8							
27								
28								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH3

Project Number: 03-217-15

Client: NCC

Site Location: Dow's Lake Landfill

Drilling Method: Hollow Stem Auger with Split Spoon

Date Completed: October 28, 2003

Supervisor: ADG

Ground Surface Elevation: Not surveyed

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation
0 / 0							ASPHALT	
1 /				0	0		FILL Brown sand and gravel fill.	
2 /								
3 / 1		X	5 5 39 50	0	0		Brown sand fill with pebbles and cobbles. Iron staining, dry.	
4 /							Borehole terminated on auger refusal (inferred bedrock) at 1.3 mBGS.	
							BOREHOLE TERMINATED	
5 /								
6 / 2								
7 /								
8 /								
9 /								
10 / 3								
11 /								
12 /								
13 / 4								
14 /								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH4 (MW4)

Project Number: 03-217-15

Date Completed: October 28, 2003

Client: NCC

Supervisor: ADG

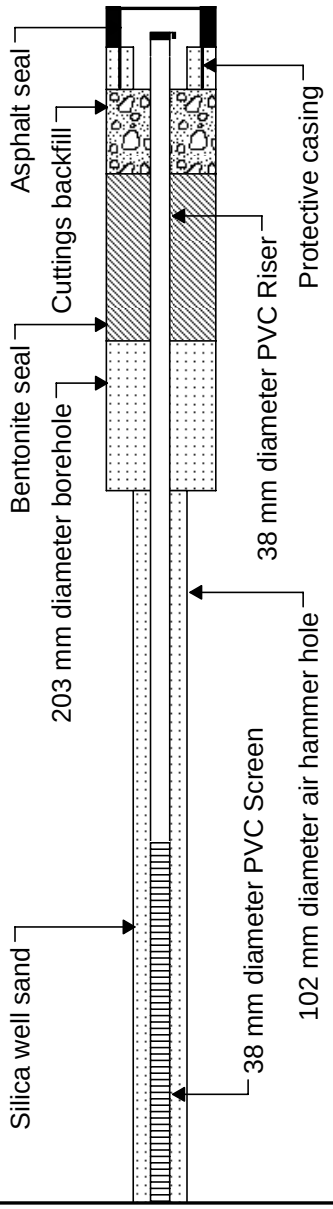
Site Location: Dow's Lake Landfill

Ground Surface Elevation: 99.31 mASD

Drilling Method: Hollow Stem Auger with Split Spoon and Bedrock Air Hammer

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION
0 / 0							GROUND SURFACE
							ASPHALT
1							FILL Brown sand and gravel fill.
2		X		0	N/A		
3 / 1			17 14 4 9	--			Cobbles, no sample recovery.
4							
5			2 50	0			Brown sand fill with cobbles. Iron staining, dry.
6 / 2							LIMESTONE BEDROCK Black shaley limestone bedrock encountered at 1.8 mBGS.
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							

INSTALLATION



BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH4 (MW4)

Project Number: 03-217-15

Date Completed: October 28, 2003

Client: NCC

Supervisor: ADG

Site Location: Dow's Lake Landfill

Ground Surface Elevation: 99.31 mASD

Drilling Method: Hollow Stem Auger with Split Spoon and Bedrock Air Hammer

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15								
16								
17	5							
18								
19								
20	6						Borehole terminated in bedrock at 6.1 mBGS.	Silica well sand
21							BOREHOLE TERMINATED	Depth of MW4 = 6.1 mBGS
22								
23	7							
24								
25								
26	8							
27								
28								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH5 (MW5)

Project Number: 03-217-15

Date Completed: October 28, 2003

Client: NCC

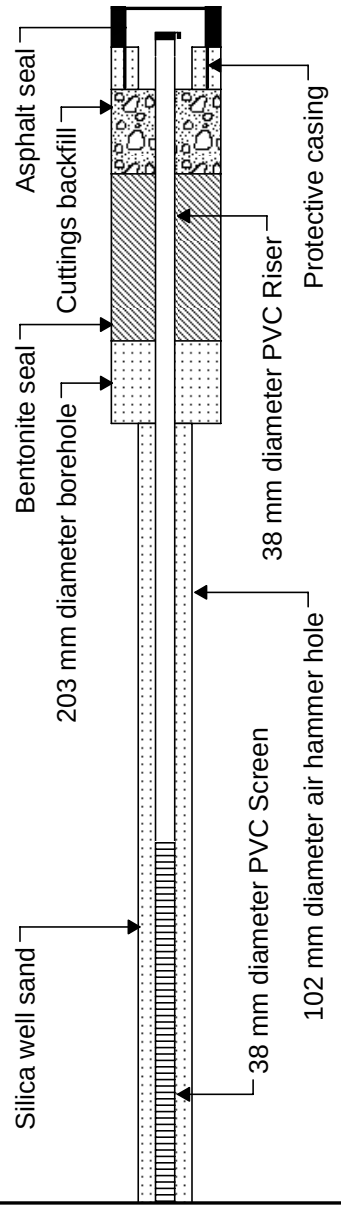
Supervisor: ADG

Site Location: Dow's Lake Landfill

Ground Surface Elevation: 99.45 mASD

Drilling Method: Hollow Stem Auger with Split Spoon and Bedrock Air Hammer

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION
0 / 0							GROUND SURFACE
							ASPHALT
1				0	N/A		FILL Brown sand and gravel fill.
2							
3 / 1		X	5 7 6 5	0			
4							
5		X		2			Grey wood layer. Musty odour, moist.
6							LIMESTONE BEDROCK Black shaley limestone bedrock encountered at 1.5 mBGS.
7 / 2							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							



BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH5 (MW5)

Project Number: 03-217-15

Date Completed: October 28, 2003

Client: NCC

Supervisor: ADG

Site Location: Dow's Lake Landfill

Ground Surface Elevation: 99.45 mASD

Drilling Method: Hollow Stem Auger with Split Spoon and Bedrock Air Hammer

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15								
16								
5								
17								
18								
19								
6							Borehole terminated in bedrock at 6.1 mBGS.	
20							BOREHOLE TERMINATED	Silica well sand Depth of MW5 = 6.1 mBGS
21								
22								
23								
7								
24								
25								
26								
8								
27								
28								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: BH6

Project Number: 03-217-15

Client: NCC

Site Location: Dow's Lake Landfill

Drilling Method: Hollow Stem Auger with Split Spoon

Date Completed: October 28, 2003

Supervisor: ADG

Ground Surface Elevation: Not surveyed

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation
0 / 0							ASPHALT	
1 /		X		0	0		FILL Brown sand and gravel fill. Borehole terminated on auger refusal at 0.6 mBGS.	
2 /							BOREHOLE TERMINATED	
3 / 1								
4 /								
5 /								
6 / 2								
7 /								
8 /								
9 /								
10 / 3								
11 /								
12 /								
13 / 4								
14 /								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: 04-BH1

MOE Well ID: Not Applicable

Project Number: 04-210-11

Date Completed: August 31, 2004

Client: NCC

Supervisor: MAH

Site Location: Former Dow's Lake Landfill

Ground Surface Elevation: Not Surveyed

Coordinates: Not Applicable

Drilling Method: Hollow Stem Auger with Split Spoon

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation.
0 – 2 / 0 – 1			15 8 7 5	12	N/A		FILL Fine to medium grained sand and gravel fill, moist.	
2 – 3 / 1		X	14 50	10	N/A		Orangey-brown sand and gravel fill with trace clay, moist. Borehole terminated on auger refusal (inferred bedrock) at 1.07 mBGS.	
							BOREHOLE TERMINATED	

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: 04-BH2

MOE Well ID: Not Applicable

Project Number: 04-210-11

Date Completed: August 31, 2004

Client: NCC

Supervisor: MAH

Site Location: Former Dow's Lake Landfill

Ground Surface Elevation: Not Surveyed

Coordinates: Not Applicable

Drilling Method: Hollow Stem Auger with Split Spoon

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation.
0 – 3 / 0 – 1			8 10 12 8	12	N/A		FILL Grey-brown, fine grained sand and gravel fill.	
3 – 6 / 1 – 2		X	5 7 5 6	10	N/A		Black, fine grained sand and gravel fill, moist.	
4 – 5 / 1 – 2			7 7 50	6	N/A		Grey-brown, medium grained sand and gravel fill, moist.	
5 – 6 / 2							Borehole terminated on auger refusal (inferred bedrock) at 1.68 mBGS.	
							BOREHOLE TERMINATED	

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: 04-BH3

MOE Well ID: Not Applicable

Project Number: 04-210-11

Date Completed: August 31, 2004

Client: NCC

Supervisor: MAH

Site Location: Former Dow's Lake Landfill

Ground Surface Elevation: Not Surveyed

Coordinates: Not Applicable

Drilling Method: Hollow Stem Auger with Split Spoon

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation.
0 / 0			6 8 8 14	16	N/A		ASPHALT FILL Dark brown sand and gravel fill.	
3 / 1			9 11 10 18	12	N/A		Iron staining.	
5 / 1		X	17 15 21 50	16	N/A		Crushed rock fragments. Iron staining. Borehole terminated on auger refusal (inferred bedrock) at 1.98 mBGS. BOREHOLE TERMINATED	
16 / 4								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: 04-BH4

MOE Well ID: Not Applicable

Project Number: 04-210-11

Date Completed: August 31, 2004

Client: NCC

Supervisor: MAH

Site Location: Former Dow's Lake Landfill

Ground Surface Elevation: Not Surveyed

Coordinates: Not Applicable

Drilling Method: Hollow Stem Auger with Split Spoon

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation.
0 – 3 / 0 – 1			22 19 15 9	14	N/A		FILL Dark grey-brown sand and gravel fill.	
3 – 4 / 1		X	12 8 7 6	10	N/A		Crushed rock fragments.	
4 – 5 / 1		X	8 50	22	N/A		Borehole terminated on auger refusal (inferred bedrock) at 1.52 mBGS.	
5 / 2							BOREHOLE TERMINATED	

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: 04-BH5

MOE Well ID: Not Applicable

Project Number: 04-210-11

Date Completed: August 31, 2004

Client: NCC

Supervisor: MAH

Site Location: Former Dow's Lake Landfill

Ground Surface Elevation: Not Surveyed

Coordinates: Not Applicable

Drilling Method: Hollow Stem Auger with Split Spoon

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
							GROUND SURFACE	No well installation.
0 / 0			2 11 20 12	20	N/A		TOPSOIL FILL Grey-brown sand and gravel fill.	
1 / 0		X						
2 / 0			6 7 10 27	14	N/A		SAND Fine to medium grained sand. FILL Dark grey-brown sandy silt fill with wood, compact, some iron staining.	
3 / 1		X						
4 / 1			8 16 15 18	8	N/A			
5 / 1								
6 / 2			6 6 50	40	N/A		Trace clay. Borehole terminated on bedrock at 2.38 mBGS.	
7 / 2								
8 / 2							BOREHOLE TERMINATED	
9 / 3								
10 / 3								
11 / 3								
12 / 4								
13 / 4								
14 / 4								
15 / 4								
16 / 4								

BOREHOLE STRATIGRAPHIC AND INSTRUMENTATION LOG

Borehole Number: 04-BH6

MOE Well ID: Not Applicable

Project Number: 04-210-11

Date Completed: August 31, 2004

Client: NCC

Supervisor: MAH

Site Location: Former Dow's Lake Landfill

Ground Surface Elevation: Not Surveryed

Coordinates: Not Applicable

Drilling Method: Hollow Stem Auger with Split Spoon

DEPTH BGS (ft / m)	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0 / 0							GROUND SURFACE	No well installation.
0			3				TOPSOIL	
1			11 15 12	14	N/A		FILL Dark brown sand and gravel fill.	
2			7				Dark grey-brown sandy silt fill with wood, some iron staining.	
3 / 1		X	6 15 16	30	N/A			
4			5					
5			5 3 50	32	N/A		Borehole terminated on auger refusal (inferred bedrock) at 1.83 mBGS.	
6 / 2							BOREHOLE TERMINATED	
7								
8								
9								
10 / 3								
11								
12								
13 / 4								
14								
15								
16								

Monitoring Well: MW17-01

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	28-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	79.39 m RTD
Number:	122170088	**Top of casing elevation:**	79.31 m RTD
Field investigator:	A. Parrott	**Easting:**	444632.4025
Contractor:	Strata Drilling Group	**Northing:**	5027203.643

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	79.39							
			ASPHALT/ INTERLOCKING BRICK	0.00							
1			SAND AND GRAVEL brown, moist	79.23 0.15							
2	0.5		SILTY SAND brown, trace gravel, moist	78.93 0.46	1	DP	50%	D-F, Metals, PAHs, PCBs, PHC F1-F4, Phenols, VOCs	<5 ● <0.02 ○		
3			BEDROCK	78.47 0.91							
4	1.0		No soil samples recovered								
5	1.5										Flushmount protective cover with concrete seal
6											Backfilled with bentonite
7	2.0										50 mm ID PVC pipe
8	2.5										Groundwater Level: 1.61 m BGS 3-Aug-17
9											
10	3.0				2	RC	n/a				Backfilled with silica sand
11											
12	3.5										
13	4.0										
14											
15	4.5			74.66							50 mm ID slotted PVC pipe
16			End of Borehole	4.72							
17	5.0										
18	5.5										
19											
20	6.0										
21	6.5										
22											
23	7.0										
24	7.5										
25											
26	8.0										
27	8.5										
28											
29	9.0										
30											
31	9.5										
32											
33	10.0										
34	10.5										

Screen Interval: 1.68 - 4.72 m BGS
Sand Pack Interval: 1.37 - 4.72 m BGS
Well Seal Interval: 0.23 - 1.37 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
RC - rock core
ppm - parts per million by volume
n/a - not available

D-F - dioxin and furans
PAHs - polycyclic aromatic hydrocarbons
PCBs - polychlorinated biphenyls
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-02

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	28-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	79.80 m RTD
Number:	122170088	**Top of casing elevation:**	79.73 m RTD
Field investigator:	A. Parrott	**Easting:**	444449.4352
Contractor:	Strata Drilling Group	**Northing:**	5027137.48

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	79.80							
			TOPSOIL black, organics, moist	0.00 79.50							
			SAND (FILL) brown-red, moist	0.30 79.19							
			SILTY SAND brown-grey, trace gravel, moist	0.61	1	DP	40%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		
				77.90	2	DP	0%				
			BEDROCK No soil samples recovered	1.91							
					3	RC	n/a				
				73.71							
			End of Borehole	6.10							

Flushmount protective cover with concrete seal

Backfilled with bentonite

50 mm ID PVC pipe

Groundwater Level: 2.12 m BGS 3-Aug-17

Backfilled with silica sand

50 mm ID slotted PVC pipe

Screen Interval: 3.05 - 6.10 m BGS
Sand Pack Interval: 2.74 - 6.10 m BGS
Well Seal Interval: 0.23 - 2.74 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
RC - rock core
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-03

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	27-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	79.52 m RTD
Number:	122170088	**Top of casing elevation:**	79.42 m RTD
Field investigator:	A. Parrott	**Easting:**	444317.1276
Contractor:	Strata Drilling Group	**Northing:**	5027135.316

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram / Description
			Ground Surface	79.52						
1			TOPSOIL black, organics, moist	0.00 79.22						
2	0.5		SAND brown-black, trace gravel, moist	0.30 78.91	1	DP	50%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 <0.02	Flushmount protective cover with concrete seal Backfilled with bentonite
3	1.0		SILTY SAND grey, trace gravel, moist	0.61	2			H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 <0.02	50 mm ID PVC pipe
4										
5	1.5		- black organic soils, trace wood							Groundwater Level: 1.33 m BGS 3-Aug-17
6					3				<5 <0.02	
7	2.0		- grey, wet			DP	40%			Backfilled with silica sand
8	2.5				4				<5 <0.02	50 mm ID slotted PVC pipe
9										
10	3.0			76.32	5	DP	0%			
11			Refusal at inferred bedrock End of Borehole	3.20						
12	3.5									
13	4.0									
14										
15	4.5									
16	5.0									
17										
18	5.5									
19										
20	6.0									
21	6.5									
22										
23	7.0									
24										
25	7.5									
26	8.0									
27										
28	8.5									
29										
30	9.0									
31	9.5									
32										
33	10.0									
34	10.5									

Screen Interval: 1.68 - 3.20 m BGS
Sand Pack Interval: 1.37 - 3.20 m BGS
Well Seal Interval: 0.23 - 1.37 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

Stantec

Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-04

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	27-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	85.13 m RTD
Number:	122170088	**Top of casing elevation:**	85.06 m RTD
Field investigator:	A. Parrott	**Easting:**	444502.0718
Contractor:	Strata Drilling Group	**Northing:**	5026981.471

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 ppm OTOV Comb● 200 400 600 800	Diagram	Description
			Ground Surface	85.13							
1			TOPSOIL black, organics, moist	0.00 84.82							
2	0.5		SILTY SAND brown, trace gravel, moist	0.30	1	DP	80%	PCBs, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 <0.02		Flushmount protective cover with concrete seal
3											Backfilled with bentonite
4	1.0				2						50 mm ID PVC pipe
5	1.5		- moist-wet								Groundwater Level: 1.61 m BGS 3-Aug-17
6					3	DP	80%	PCBs, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 <0.02		
7	2.0		- wet								Backfilled with silica sand
8	2.5			82.38	4				<5		50 mm ID slotted PVC pipe
9			Refusal at inferred bedrock	2.74					<0.02		
10	3.0		End of Borehole								
11											
12	3.5										
13	4.0										
14											
15	4.5										
16	5.0										
17											
18	5.5										
19											
20	6.0										
21	6.5										
22											
23	7.0										
24	7.5										
25											
26	8.0										
27											
28	8.5										
29	9.0										
30											
31	9.5										
32											
33	10.0										
34	10.5										

Screen Interval: 1.37 - 2.90 m BGS
Sand Pack Interval: 1.22 - 2.90 m BGS
Well Seal Interval: 0.23 - 1.22 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

PCBs - polychlorinated biphenyls
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

Stantec

Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-05

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	26-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	94.49 m RTD
Number:	122170088	**Top of casing elevation:**	94.39 m RTD
Field investigator:	A. Parrott	**Easting:**	444231.6325
Contractor:	Strata Drilling Group	**Northing:**	5026850.536

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	94.49							
1			TOPSOIL black-brown, organics, moist	0.00							
2	0.5			93.88	1	DP	100%	H-P, Metals, PAHs, Phenols, VOCs	<5 ● ○ <0.02		Flushmount protective cover with concrete seal
3			SILT brown-grey, moist	0.61							
4	1.0				2			PHC F1-F4	<5 ● ○ <0.02		Backfilled with bentonite
5	1.5										
6					3				<5 ● ○ <0.02		50 mm ID PVC pipe
7	2.0			92.05		DP	100%				
8	2.5		SILTY SAND brown, trace gravel, wet	2.44							
9					4			H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		
10	3.0		- brown-grey								
11					5				<5 ● ○ <0.02		Groundwater Level: 3.43 m BGS 3-Aug-17
12	3.5		- grey								
13	4.0					DP	80%				
14					6				<5 ● ○ <0.02		
15	4.5										Backfilled with silica sand
16					7				<5 ● ○ <0.02		
17	5.0										50 mm ID slotted PVC pipe
18	5.5					DP	80%				
19					8				<5 ● ○ <0.02		
20	6.0			88.39							
21			End of Borehole	6.10							
22	6.5										
23	7.0										
24											
25	7.5										
26	8.0										
27											
28	8.5										
29											
30	9.0										
31											
32	9.5										
33	10.0										
34	10.5										

Screen Interval: 3.05 - 6.10 m BGS
Sand Pack Interval: 2.74 - 6.10 m BGS
Well Seal Interval: 0.23 - 2.74 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

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Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-06

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	26-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	95.09 m RTD
Number:	122170088	**Top of casing elevation:**	95.03 m RTD
Field investigator:	A. Parrott	**Easting:**	444175.7424
Contractor:	Strata Drilling Group	**Northing:**	5026815.478

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	95.09							
1			TOPSOIL black-brown, organics, moist	0.00 94.78							
2	0.5		SANDY SILT brown, trace gravel, moist	0.30	1	DP	75%	H-P, Metals, PAHs, Phenols, VOCs			
3	1.0			93.87					<5		
4			SILTY SAND brown, trace gravel, moist to wet	1.22	2			PHC F1-F4	● 1 ○		Flushmount protective cover with concrete seal Backfilled with bentonite 50 mm ID PVC pipe
5	1.5										
6											
7	2.0										
8	2.5				3	DP	50%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		Backfilled with silica sand
9											
10	3.0		- brown-grey								50 mm ID slotted PVC pipe
11					4				<5		
12	3.5								● ○ <0.02		
13	4.0					DP	n/a		<5		
14				90.82	5				● ○ <0.02		
15	4.5		SAND brown, wet	4.27 90.48							Groundwater Level: dry on 3-Aug-17
16			Refusal at inferred bedrock End of Borehole	4.60	6	DP	n/a		● ○ <0.02		
17	5.0										
18	5.5										
19											
20	6.0										
21	6.5										
22											
23	7.0										
24	7.5										
25											
26	8.0										
27	8.5										
28											
29	9.0										
30											
31	9.5										
32											
33	10.0										
34	10.5										

Screen Interval: 1.55 - 4.60 m BGS
Sand Pack Interval: 1.25 - 4.60 m BGS
Well Seal Interval: 0.23 - 1.25 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

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Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-07

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	26-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	94.64 m RTD
Number:	122170088	**Top of casing elevation:**	94.58 m RTD
Field investigator:	A. Parrott	**Easting:**	444240.9625
Contractor:	Strata Drilling Group	**Northing:**	5026754.904

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	94.64							
1			TOPSOIL black, organics, moist	0.00 94.34							
2	0.5		SILTY SAND brown, trace gravel, moist to wet	0.30	1	DP	40%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		Flushmount protective cover with concrete seal
3											
4	1.0										Backfilled with bentonite
5	1.5										
6											
7	2.0				2	DP	40%		<5 ● ○ <0.02		50 mm ID PVC pipe
8	2.5										
9											
10	3.0										
11					3				<5 ● ○ <0.02		
12	3.5					DP	100%				
13	4.0								<5 ● ○ <0.02		
14			- brown-grey		4						
15	4.5										Backfilled with silica sand
16											
17	5.0										Groundwater Level: 4.58 m BGS 3-Aug-17
18	5.5				5	DP	50%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		50 mm ID slotted PVC pipe
19											
20	6.0		- wet								
21											
22	6.5				6	DP	25%		<5 ● ○ <0.02		
23	7.0										
24											Slough
25	7.5			87.02							
26			End of Borehole	7.62							
27	8.0										
28											
29	8.5										
30											
31	9.0										
32											
33	9.5										
34	10.0										
	10.5										

Screen Interval: 3.66 - 6.71 m BGS
Sand Pack Interval: 3.35 - 7.01 m BGS
Well Seal Interval: 0.23 - 3.35 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

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Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-08

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	26-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	95.59 m RTD
Number:	122170088	**Top of casing elevation:**	95.52 m RTD
Field investigator:	A. Parrott	**Easting:**	444299.964
Contractor:	Strata Drilling Group	**Northing:**	5026787.713

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	95.59							
1			TOPSOIL black, organics, moist	0.00							Flushmount protective cover with concrete seal
2	0.5			94.98							
3			SAND brown, trace silt and gravel, moist	0.61	1	DP	40%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		Backfilled with bentonite
4	1.0										50 mm ID PVC pipe
5	1.5			94.07							
6			SILTY SAND brown, trace gravel, moist	1.52	2	DP	50%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		
7	2.0										
8				93.15							
9	2.5		No soil samples recovered - augered through boulders	2.44							
10	3.0				3	DP	20%				Backfilled with silica sand
11											
12	3.5										50 mm ID slotted PVC pipe
13	4.0										
14											
15	4.5				4	RC	n/a				
16											
17	5.0			90.41							
18			SILTY SAND grey, trace gravel, moist	5.18 90.11							Groundwater Level: 5.21 m BGS 3-Aug-17
19	5.5		Refusal at inferred bedrock End of Borehole	5.49							
20											
21	6.0										
22											
23	6.5										
24	7.0										
25											
26	7.5										
27	8.0										
28											
29	8.5										
30	9.0										
31											
32	9.5										
33	10.0										
34	10.5										

Screen Interval: 2.23 - 5.28 m BGS
Sand Pack Interval: 1.93 - 5.49 m BGS
Well Seal Interval: 0.23 - 1.93 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
RC - rock core
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

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Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-09

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	27-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	99.19 m RTD
Number:	122170088	**Top of casing elevation:**	99.12 m RTD
Field investigator:	A. Parrott	**Easting:**	444493.9007
Contractor:	Strata Drilling Group	**Northing:**	5026676.009

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	99.19							
1			TOPSOIL black, organics, moist	0.00 98.89							
2	0.5		SAND (FILL) brown, trace gravel, moist	0.30	1	DP	30%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		Flushmount protective cover with concrete seal Backfilled with bentonite
3	1.0			97.97							50 mm ID PVC pipe
4			SILTY SAND brown, trace gravel, moist	1.22							
5	1.5				2	DP	70%		<5 ● ○ <0.02		Groundwater Level: 2.24 m BGS 3-Aug-17
6											
7	2.0										
8					3				<5 ● ○ <0.02		
9	2.5										
10					4	DP	50%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		
11	3.0										
12					5	DP	25%		<5 ● ○ <0.02		
13	3.5										
14											Backfilled with silica sand
15	4.0				6	DP	80%		<5 ● ○ <0.02		
16											
17	4.5										
18			- grey, wet		7				<5 ● ○ <0.02		50 mm ID slotted PVC pipe
19	5.0										
20					8	DP	100%		<5 ● ○ <0.02		
21	5.5										
22					9				<5 ● ○ <0.02		Slough
23	6.0										
24				91.57							
25	6.5		End of Borehole	7.62							
26											
27	7.0										
28											
29	7.5										
30											
31	8.0										
32											
33	8.5										
34											
	9.0										
	9.5										
	10.0										
	10.5										

Screen Interval: 3.66 - 6.71 m BGS
Sand Pack Interval: 3.35 - 7.01 m BGS
Well Seal Interval: 0.23 - 3.35 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

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Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

Monitoring Well: MW17-10

Project:	Phase II Environmental Site Assessment	**Drilling method:**	Geoprobe (direct push)
Client:	Public Services and Procurement Canada	**Date started/completed:**	27-Jul-2017
Location:	870 and 930 Carling Avenue and 520 Preston Street, Ottawa, Ontario	**Ground surface elevation:**	96.57 m RTD
Number:	122170088	**Top of casing elevation:**	96.48 m RTD
Field investigator:	A. Parrott	**Easting:**	444546.5613
Contractor:	Strata Drilling Group	**Northing:**	5026699.988

SUBSURFACE PROFILE				SAMPLE DETAILS					INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV / Comb ● 200 400 600 800	Diagram	Description
			Ground Surface	96.57							
1			TOPSOIL black, organics, moist	0.00 96.26							
2	0.5		SILTY SAND brown, trace gravel, wet	0.30	1	DP	60%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		Flushmount protective cover with concrete seal
3											Backfilled with bentonite
4	1.0				2				<5 ● ○ <0.02		50 mm ID PVC pipe
5	1.5		- moist								
6					3	DP	75%	H-P, Metals, PAHs, PHC F1-F4, Phenols, VOCs	<5 ● ○ <0.02		
7	2.0										
8	2.5				4				<5 ● ○ <0.02		Groundwater Level: 2.79 m BGS 3-Aug-17
9											
10	3.0				5	DP	75%		<5 ● ○ <0.02		
11											
12	3.5				6				<5 ● ○ <0.02		Backfilled with silica sand
13	4.0										
14					7	DP	50%		<5 ● ○ <0.02		50 mm ID slotted PVC pipe
15	4.5		- grey								
16					8				<5 ● ○ <0.02		
17	5.0										
18											
19	5.5										
20				90.47							
21	6.0		No sample recovered	6.10	9	DP	0%				Slough
22	6.5										
23				89.25							
24	7.0		End of Borehole	7.32							
25	7.5										
26											
27	8.0										
28	8.5										
29											
30	9.0										
31											
32	9.5										
33											
34	10.0										
	10.5										

Screen Interval: 3.05 - 6.10 m BGS
Sand Pack Interval: 2.74 - 6.40 m BGS
Well Seal Interval: 0.23 - 2.74 m BGS

Notes:
m BGS - metres below ground surface
DP - direct push sample
ppm - parts per million by volume
n/a - not available

H-P - herbicides and pesticides
PAHs - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOCs - volatile organic compounds
Comb - combustible soil vapour
TOV - total organic vapour

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Drawn By/Checked By: T. Pawlick / J. Yaraskavitch

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Environmental Investigation of Existing Fault Line
Proposed New Hospital Campus - Carling Avenue
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Geoprobe **DATE** July 28, 2017

FILE NO. PE4096

HOLE NO. BH 7

SOIL DESCRIPTION		STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE										
TOPSOIL	0.25		SS	1	71	6	0			
FILL: Brown silty clay, trace sand, gravel, cobbles and boulders	1.19		SS	2	71	8	1			
FILL: Brown silty sand	1.52		SS	3	54	4				
FILL: Brown silty clay, some sand, trace gravel, cobbles, organics, paint and tiles	1.96		SS	4	42	22	2			
FILL: Compact to very loose sand with wood pieces	3.33		SS	5	4	0	3			
End of Borehole										
Practical refusal to augering at 3.33m depth										
(GWL @ 2.01m - August 9, 2017)										

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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SOIL PROFILE AND TEST DATA

Environmental Investigation of Existing Fault Line
Proposed New Hospital Campus - Carling Avenue
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Geoprobe **DATE** July 28, 2017

FILE NO. PE4096

HOLE NO. BH 7A

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE						0		20 40 60 80	
OVERBURDEN						1			
2.11						2			
End of Borehole Practical refusal to augering at 2.11m depth (BH dry upon completion)									

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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