Phase Two Environmental Site Assessment
266 and 268 Carruthers Avenue, Ottawa, Ontario

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McCormick Park Developments Incorporated

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Phase Two Environmental Site Assessment

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Executive Summary

EXP Services Inc. (EXP) was retained by McCormick Park Developments Incorporated to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 266 and 268 Carruthers Avenue in Ottawa, Ontario hereinafter referred to as the 'Phase Two property'. The objective of the Phase Two ESA investigation was to assess the quality of the soil conditions within the area of potential environmental concern (APEC) identified in a Phase One ESA prepared by EXP.

EXP understands that the most recent use of the Phase Two property is residential, and that the proposed future use is also residential. Therefore, as per the amendments to Ontario Regulation 153/04 that came into effect on December 4, 2019, a Record of Site Condition (RSC) is not required.

The Phase Two property has the municipal address of 266 and 268 Carruthers Avenue and is located within a residential neighbourhood on the west side of Carruthers Avenue, approximately 40 m north of Armstrong Street. The Phase Two property is L-shape and has an area of 0.04 hectares.

The Phase Two property has the property identification numbers (PIN) 04094-0152 and PIN 04094-0339. The legal description of the Phase Two property is Part Lot 6 and 7 Plan 83 on CR574373 and Part 1 on Plan 4R33847; City of Ottawa.

Based on a review of historical aerial photographs, historical maps, and other records, it appears that the Phase Two property was first developed for residential use between 1902 and 1912. The existing residence at 266 Carruthers Avenue appears to have been present on the Phase Two property since it was first developed. The property at 268 Carruthers Avenue was vacant, as the former building was demolished in May 2022.

Topographically, the Phase Two property is relatively flat. The surrounding area has a slight slope down towards the north. Regional groundwater flow direction is inferred to be in a northerly direction towards the Ottawa River, approximately 1 km to the north. Based on previous investigations in the area, the groundwater flow direction on the Phase Two property is to the northwest. There are no areas of natural or scientific interest (ANSI) within the Phase One study area.

EXP prepared a report entitled *Phase One Environmental Site Assessment,* 266 Carruthers Avenue*, Ottawa, Ontario* dated June 7, 2022. Based on the results of the Phase One ESA, EXP identified one APEC.

Table EX.1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase Two property	PCA#30 – Imported Fill Material of Unknown Quality	On-Site	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), metals	Soil

The scope of work for the Phase Two ESA was as follows:

- Drilling six boreholes on the subject property;
- Submitting soil samples for laboratory analysis PHC, VOC, PAH and metals;
- Comparing the results of the soil chemical analyses to applicable criteria, as set out by the Ontario Ministry of the Environment, Conservation and Parks (MECP);

- Conducting an elevation survey of three boreholes; and,
- Preparing a report summarizing the results of the assessment activities.

Based on the Phase Two ESA results, the following summary is provided:

- The Phase Two ESA consisted of advancing a total of six (6) boreholes to investigate the quality of fill on the property which was identified in this Phase One and Two ESA. Two monitoring wells were installed on the Phase Two property. A worst-case sample of the fill material from four of the boreholes was submitted for laboratory analysis of PHCs, VOC, PAH, and/or metals. A groundwater sample was collected from MW-6 and submitted for laboratory analysis of PHC and VOC.
- A 75 mm to 350 mm layer of granular fill was observed at the ground surface of several boreholes. Soil at the Phase Two property prior to remediation generally consisted of sand and gravel fill material. The fill layer ranged in thickness from 0.4 to 1.6 m and was encountered in all boreholes. Limestone bedrock was present underlying the fill material. No native soil was present at the Phase Two property.
- Groundwater was encountered at depths ranging from 1.70 m in BH-1 to 3.10 m in BH-3 in August 2022. The groundwater flow direction could not be calculated since there were only two water levels available on the Phase Two property in August 2022.
- Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of PHC, VOC, PH, and metals, from the 266 Carruthers Avenue parcel and one soil sample was submitted for the chemical analysis of PHC and BTEX from the 268 Carruthers Avenue parcel. The concentrations of PHC and BTEX measured in the analysed soil samples were less than MECP 2011 Table 7 SCS, as shown in Table 1 in Appendix B, with the exception of PHC F3 and F4 in the soil sample collected from BH-2 SS2 at a depth of 0.15 to 0.75 m and cadmium, lead, mercury and zinc in all three soil samples. Based on these results, the fill on the property is considered to be impacted.
- The concentrations of VOC and PHC in the analyzed groundwater sample were less than the 2011 MECP Table 7 SCS.

The Qualified Person can confirm that the Phase Two Environmental Site Assessment was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices.

This executive summary is a brief synopsis of the report and should not be read in lieu of reading the report in its entirety.

1.0 Introduction

EXP Services Inc. (EXP) was retained by McCormick Park Developments Incorporated to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 266 and 268 Carruthers Avenue in Ottawa, Ontario hereinafter referred to as the 'Phase Two property'. The objective of the Phase Two ESA investigation was to assess the quality of the soil conditions within the areas of potential environmental concern (APEC) identified in a Phase One ESA prepared by EXP.

The most recent use of the property is residential, and the proposed future use is also residential. Therefore, as per Ontario Regulation 153/04, a Record of Site Condition (RSC) is not required.

This report has been prepared in accordance with the Phase Two ESA standard as defined by Ontario Regulation 153/04 (as amended), and in accordance with generally accepted professional practices. Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. Limitation of liability, scope of report and third-party reliance are outlined in Section 7 of this report.

Matthew Zammit, P. Eng. conducted the field assessment work and Mark McCalla, P. Geo, was the report author for this project and is a Qualified Person, as defined by Ontario Regulation 153/04. Leah Wells, P.Eng. reviewed the report.

1.1 Site Description

The Phase Two property has the municipal address of 266 and 268 Carruthers Avenue. The Phase Two property is located within a residential neighbourhood on the west side of Carruthers Avenue, approximately 40 m north of Armstrong Street. The Phase Two property is L-shaped and has an area of 0.04 hectares. A Site Location Plan is provided as Figure 1 in Appendix B.

The Phase Two property has the property identification numbers (PIN) 04094-0152 and PIN 04094-0339. The legal description of the Phase Two property is Part Lot 6 and 7 Plan 83 on CR574373 and Part 1 on Plan 4R33847; City of Ottawa.

Topographically, the Phase Two property is relatively flat. The surrounding area has a slight slope down towards the north. Regional groundwater flow direction is inferred to be in a northerly direction towards the Ottawa River, found approximately 1 km to the north.

The approximate Universal Transverse Mercator (UTM) coordinates for the Phase Two property centroid is NAD83, Zone 18T, 443058 m E, 5028006 m N. The UTM coordinates were based on an estimate derived using Google Earth™. The accuracy of the centroid is estimated to range from 5 to 50 m.

1.2 Property Ownership

The Site is owned by McCormick Park Developments Incorporated. Authorization to proceed with this investigation was provided by Mr. Joey Theberge on behalf of McCormick Park Developments Inc. Contact information for Mr. Theberge is P.O. Box 74155, Ottawa, ON, Ontario, K0A 1L0.

1.3 Current and Proposed Future Use

The Phase Two property is currently occupied by a two-storey residence with a full basement. A paved driveway and detached single-car garage are present on the property. The south part of the Phase Two property is vacant. The proposed future land use is residential.

1.4 Applicable Site Condition Standards

Analytical results obtained for soil and groundwater samples were compared to Site Condition Standards (SCS) established under subsection 169.4(1) of the Environmental Protection Act, and presented in the document entitled *Soil, Ground Water*

and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, 2011. This document provides tabulated background SCS (Table 1) applicable to environmentally sensitive sites and effects-based generic SCS (Tables 2 to 9) applicable to non-environmentally sensitive sites. The effects-based SCS (Tables 2 to 9) are protective of human health and the environment for different groundwater conditions (potable and non-potable), land use scenarios (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil texture (coarse or medium/fine) and restoration depth (full or stratified).

Table 1 to 9 SCS are summarized as follows:

- Table 1 – applicable to sites where background concentrations must be met (full depth), such as sensitive sites where site-specific criteria have not been derived
- Table 2 – applicable to sites with potable groundwater and full depth restoration
- Table 3 – applicable to sites with non-potable groundwater and full depth restoration
- Table 4 – applicable to sites with potable groundwater and stratified restoration
- Table 5 – applicable to sites with non-potable groundwater and stratified restoration
- Table 6 – applicable to sites with potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 7 – applicable to sites with non-potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 8 – applicable to sites with potable groundwater and that are within 30 m of a water body
- Table 9 – applicable to sites with non-potable groundwater and that are within 30 m of a water body

Application of the generic or background SCS to a specific site is based on a consideration of site conditions related to soil pH, thickness and extent of overburden material, and proximity to an area of environmental sensitivity or of natural significance. For some chemical parameters, consideration is also given to soil textural classification with SCS having been derived for both coarse and medium-fine textured soil conditions.

For assessment purposes, EXP selected the 2011 Table 7 SCS in a potable groundwater condition for a residential property use. The selection of this category was based on the following factors:

- Bedrock is less than 2 metres below grade across the subject property;
- There are no surface water bodies within 30 metres of the subject property;
- The Phase Two property is not located within an area of natural significance, does not include nor is adjacent to an area of natural significance, and does not include land that is within 30 metres of an area of natural significance;
- Potable water for the Phase Two property is provided by the City of Ottawa through its water distribution system, and there are no potable water wells identified to be within 250 metres of the Phase Two property;
- The Phase Two property is not located in an area designated in a municipal official plan as a well-head protection area;
- The Phase Two property is planned for residential use; and
- It is the opinion of the Qualified Person who oversaw this work that the Phase Two property is not a sensitive site.

2.0 Background Information

2.1 Physical Setting

The Phase Two property has the municipal address of 266 and 268 Carruthers Avenue and is located within a residential neighbourhood on the west side of Carruthers Avenue, approximately 40 m north of Armstrong Street. The Phase Two property is L-shaped and has an area of 0.04 hectares.

The Phase Two property has the property identification numbers (PIN) 04094-0152 and PIN 04094-0339. The legal description of the Phase Two property is Part Lot 6 and 7 Plan 83 on CR574373 and Part 1 on Plan 4R33847; City of Ottawa.

Based on a review of historical aerial photographs, historical maps, and other records, it appears that the Phase Two property was first developed for residential use between 1902 and 1912. The existing residence appears to have been present on the Phase Two property since it was first developed.

Topographically, the Phase Two property is relatively flat. The surrounding area has a slight slope down towards the north. Regional groundwater flow direction is inferred to be in a northerly direction towards the Ottawa River, approximately 1 km to the north. Based on previous investigations in the area, the groundwater flow direction on the Phase Two property is to the northwest. There are no areas of natural or scientific interest (ANSI) within the Phase Two study area.

In accordance with Section 41 of the Ontario Regulation 153/04 (as amended), the Phase Two property is not an environmentally sensitive area. In addition, the Phase Two property is not located within an area of natural significance and it does not include land that is within 30 metres of an area of natural significance.

The Phase Two property is a shallow soil property as defined in Section 43.1 of the regulation. It does not include all or part of a water body or is adjacent to a water body or include land that is within 30 metres of a water body.

Bedrock in the general area of the Phase Two property consists of limestone of the Ottawa Formation. Native surficial soil consists of sand and silt overlying shallow bedrock.

2.2 Past Investigations

EXP prepared a report entitled *Phase One Environmental Site Assessment, 266 Carruthers Avenue, Ottawa, Ontario* dated June 7, 2022. The following PCAs were identified in the Phase Two study area:

- **PCA 1** – 179 Armstrong Street (30 m south) – Commercial building had a UST on the north side of the building as per the 1956 FIP (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 2** – 1092 – 1096 Wellington Street (160 m southeast) – Former gasoline service station with two fuel USTs (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 3** – 177 Armstrong Street (30 m south) – Former furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 4** – 179 Armstrong Street (30 m south) – Former furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 5** – 269 Carruthers Avenue (10 m south) – Former furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 6** – 180 Armstrong Street (40 m south) – Former automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 7** – 1 Grant Street (60 m south) – Active automotive service garage (PCA #10 – Commercial Autobody Shop);

- **PCA 8** – 271 Carruthers Avenue (20 m southeast) – Former automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 9** – 1119 Wellington Street (110 m southeast) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 10** – 1125 Wellington Street (120 m south) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 11** – 1097 Wellington Street (130 m southeast) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 12** – 1104 Wellington (130 m south) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 13** – 1141/1149 Wellington Street (115 m south) – Former automotive service garage and service station (PCA #10 – Commercial Autobody Shop, PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 14** – 131 Armstrong Street (130 m east) – Former automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 15** – 1175 Wellington Street (215 m southwest) – Former gas station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 16** – 300 Parkdale Avenue (240 m west) – Commercial printing operation (PCA #Other);
- **PCA 17** – 1065 Wellington Street (240 m east) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 18** – 1067 Wellington Street (240 m east) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 19** – 380 Parkdale Avenue (220 m southwest) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 20** – 390 Parkdale Avenue (220 m southwest) – Former gass station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 21** – 172 Carruthers Avenue (250 m north) – Hydro One substation (PCA #55 – Transformer Manufacturing, Processing and Use);
- **PCA 22** – 103 Pinhey Street (170 m east) – Former smelting and refining operation (PCA #35 – Mining, Smelting and Refining);
- **PCA 23** –1132 Wellington Street (210 m southeast) – Former gas station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 24** – 1134 Wellington Street (210 m south) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 25** – 1124 Wellington Street (170 m southeast) – Former gas station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks;
- **PCA 26** – 1120 Wellington Street (125 southeast) – Former Chinese laundry, former gas station (PCA #37 – Operation of Dry-Cleaning Equipment, PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 27** – 1112 Wellington Street (170 southeast) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);

- **PCA 28** – 1091 Wellington Street (130 m southeast) – Former Chinese laundry (PCA #37 – Operation of Dry-Cleaning Equipment).
- **PCA 29** – 1069 Wellington Street (240 m east) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 30** – Phase Two property – Fill material is present throughout the Phase One property (PCA #30 – Importation of Fill Material of Unknown Quality); and,
- **PCA 31** – Phase Two property – Furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks).

Any PCAs located significantly distant (greater than 100 m) from the Phase Two property were considered to be too distant to be contributing to an APEC. **PCA 2**, and **PCA 9** through **PCA 29** were located greater than 100 m from the Phase Two property, and therefore not considered to result in an APEC.

Furthermore, based on previous subsurface investigation on adjacent properties to the south, the inferred groundwater flow direction at the Phase Two property is to the northwest. Therefore, the properties within the Phase One study area northwest of the Phase Two property were considered to be hydraulically down-gradient of the Phase Two property; and the properties to the north, east, and west of the Phase Two property were considered to be hydraulically cross-gradient to the Phase Two property.

Previous subsurface investigations on the south adjacent property in 2019 assessed soil and groundwater impacts associated with **PCA 1**, and **PCA 3** through **PCA 7**. No groundwater samples on the south adjacent property were impacted, including samples taken from adjacent to the Phase Two property line. Therefore, no potential groundwater contaminants from these PCAs have migrated onto the Phase Two property, and do not contribute to APECs.

The HLUI search identified a former repair garage at 271 Carruthers Avenue (**PCA 8**). A residence was constructed at 271 Carruthers Avenue prior to 1902 and was present until at leas 1956. In addition, the property is listed in the city directories as residential for all of the years reviewed. It is unlikely that this property ever operated as a repair garage.

The furnace oil AST (**PCA 31**), as well as the concrete floor beneath the AST, were observed to be in good condition. The current tenant has occupied the residence since 1969. The furnace oil AST has been replaced three times in this time frame, and not spills or leaks have been noted. Therefore, the presence of the AST does not result in an APEC.

Therefore, the only PCA which results in an APEC is **PCA 30**, the presence of fill of unknown quality at the Phase Two property.

Based on the results of the Phase One ESA, the following areas of potential environmental concern (APEC) were identified:

Table 2.1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase Two property	PCA#30 – Importation of Fill Material of Unknown Quality	On-Site	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), metals	Soil

The location of the APEC is shown in Figure 3 in Appendix A.

The Phase Two ESA was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices.

3.0 Scope of the Investigation

3.1 Overview of Site Investigation

The purpose of the Phase Two ESA was to investigate the soil quality at the Phase Two property and to characterize conditions in the fill material related to the PCA described above within the APEC shown on Figure 3 in Appendix A.

3.2 Scope of Work

The scope of work for the Phase Two ESA was as follows:

- Drilling six boreholes on the subject property, completing two as monitoring wells;
- Submitting soil samples from the boreholes for laboratory analysis of volatile organic compounds (VOC), petroleum hydrocarbon (PHC) fractions F1 to F4, polycyclic aromatic hydrocarbons (PAH), and inorganics;
- Collecting ground water samples from the monitoring wells and submitting the groundwater samples for laboratory analysis of VOC and PHC;
- Comparing the results of the soil and groundwater chemical analyses to applicable criteria, as set out by the Ontario Ministry of the Environment, Conservation and Parks (MECP);
- Conducting an elevation survey of the boreholes; and,
- Preparing a report summarizing the results of the assessment activities.

This report has been prepared in accordance with the Phase Two ESA standard as defined by Ontario Regulation 153/04 (as amended), and in accordance with generally accepted professional practices. Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. Limitation of liability, scope of report and third-party reliance are outlined in Section 8 of this report.

3.3 Media Investigated

The Phase Two ESA included the investigation of soil on the Phase Two property. As there are no water bodies on the Phase Two property, no surface water or sediment sampling was required.

The contaminants of potential concern (COPC) identified in the Phase One ESA were identified as target parameters for this Phase Two ESA. The APEC and COPC identified in the Phase One ESA are outlined in Section 2.2.

3.4 Phase One Conceptual Site Model

Based on a review of historical aerial photographs, historical maps, and other records, it appears that the Phase Two property was first developed for residential use between 1902 and 1912. The existing residence appears to have been present on the Phase Two property since it was first developed.

The following on-site PCA were identified:

- PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks
- PCA #30 – Imported Fill Material of Unknown Quality

The following off-site PCAs were identified:

- PCA #10 – Commercial Autobody Shops
- PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks

- PCA #35 – Mining, Smelting and Refining
- PCA #37 – Operation of Dry Cleaning Equipment (where chemicals are used)
- PCA #55 – Transformer Manufacturing, Processing and Use

The Phase Two study area and PCA is provided as Figure 2 in Appendix A. The locations of the APEC that may be affected by the PCA are shown on Figure 4 in Appendix A.

The following APEC were identified:

- APEC #1 – Entire Phase Two property (PCA #30 – Imported Fill Material of Unknown Quality)

3.5 Deviations from Sampling and Analysis Plan

The field investigative and sampling program was carried out following the requirements of the Phase Two property, as described in Section 4. No significant deviations from the sampling and analysis plan (SAAP), as provided in Appendix C, were reported that affected the sampling and data quality objectives for the Phase Two property.

3.6 Impediments

No physical impediments were encountered during the field investigation. The entire Phase Two property was accessible at the time of the investigation.

4.0 Investigation Methodology

4.1 General

The site investigative activities consisted of the drilling of boreholes to facilitate the collection of soil samples for visual inspection, to record relevant geotechnical information and the installation of standpipes for hydrogeological property characterization.

4.2 Borehole Drilling

Prior to the commencement of drilling, the locations of underground public utilities including telephone, natural gas and electrical lines were marked at the subject property by public locating companies. A private utility locating contractor was also retained to clear the individual borehole locations.

On August 30, 2019, BH-5 and MW-6 were advanced at the Phase Two property by Marathon Drilling, a licensed well contractor, under the full-time supervision of EXP staff. A groundwater monitoring well was installed in MW-6. A truck mounted CME drill rig with split spoon samplers was used to collect the soil samples.

A post-remedial drilling investigation was conducted on the 268 Carruthers Avenue parcel on May 11, 2022, by Strata Drilling Group (Strata). Strata advanced one borehole (MW22-1) on the Phase Two property, using a GM 100 track mount drill. The borehole was drilled to a depth of 6.3 m bgs. All soil was removed from the 268 Carruthers Avenue parcel and the borehole was cored through bedrock.

On July 22, 2022, EXP oversaw drilling of three (3) boreholes (BH-1 to BH-3) on the Phase Two property as part of a Geotechnical Investigation using a CME-55 truck-mounted drill rig equipped with continuous flight hollow-stem auger and rock coring equipment. The borehole locations are shown on Figure 4 in Appendix C. The boreholes were advanced using a rotary drilling rig, and samples collected using a split spoon sampler at 1.2 m intervals. Sampling for environmental purposes was only conducted on the fill samples collected from the boreholes.

EXP staff continuously monitored the drilling activities to log the stratigraphy observed from the recovered samples, to record the depth of the samples, and to record total depths of borings. Field observations are documented on the borehole logs provided in Appendix D.

4.3 Soil: Sampling

Soil sampling was completed on the Phase Two property to address the identified APEC.

4.4 Field Screening Measurements

Soil samples were screened during the borehole advancement. Soil samples were placed in a sealed Ziploc plastic bag and allowed to reach ambient temperature prior to field screening with a combustible vapour meter calibrated to hexane gas prior to use. The field screening measurements were made by inserting the instrument's probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These 'headspace' readings provide a real-time indication of the relative concentration of combustible vapours encountered in the subsurface during drilling and are used to aid in the assessment of the vertical and horizontal extent of potential impacts and the selection of soil samples for analysis.

Readings of organic vapour concentrations in the soil samples collected during the drilling investigation were recorded using an RKI Eagle 2 with a special photo-ionization detector (PID) sensor, where there was sufficient recovery. This instrument is designed to detect and measure concentrations of combustible gas in the atmosphere in 0.02 parts per million by volume (ppmv) increments from 0 ppmv to 50 ppmv and in 1 ppmv increments from 0 ppmv to 2,000 ppmv.

Instrument calibration is conducted using standard gases comprised of known concentrations of isobutylene in air. Instrument calibration is conducted prior to each use. If the instrument readings are within ±10% of the standard gas value, then the instrument is deemed to be calibrated, however if the readings are greater than ±10% of the standard gas value then the instrument is re-calibrated prior to use.

The field screening measurements, in parts per million by volume (ppmv), are presented in the borehole logs provided in Appendix D. A worst-case soil sample and a blind duplicate soil sample were submitted for laboratory analysis of PHC, VOC, PAH, and metals.

4.7 Groundwater: Sampling

No groundwater APECs were identified on the 266 Carruthers Avenue parcel and therefore, no groundwater samples were collected for laboratory analysis from that parcel.

A groundwater sample was collected from MW-6 in 2019 via a low flow sampling technique using a YSI 550 multi probe water quality meter. The YSI probe was calibrated using in-house reference standards. Prior to collecting the groundwater samples, water quality field parameters (turbidity, dissolved oxygen, conductivity, temperature, pH, and oxidation reduction potential) were monitored until stable readings were achieved to ensure that the samples collected were representative of actual groundwater conditions. These parameters are considered to be stable when three consecutive readings meet the following conditions:

- Turbidity: within 10% for values greater than 5 nephelometric turbidity units (NTU), or three values less than 5 NTU;
- Dissolved oxygen: within 10% for values greater than 0.5 mg/L, or three values less than 0.5 mg/L;
- Conductivity: within 3%;
- Temperature: ± 1°C;
- pH: ± 0.1 unit; and,
- Oxidation reduction potential: ±10 millivolts.

When stabilization occurs, equilibrium between groundwater within a monitor and the surrounding formation water is attained. As such, samples collected when stabilization occurs are considered to be representative of formation water.

The groundwater sampling during the completion of this Phase Two ESA was undertaken in general accordance with the SAAP presented in Appendix C. The groundwater samples were placed in clean coolers containing ice packs prior to and during transportation to the laboratory. The samples were transported to the laboratory within 24 hours of collection with a chain of custody. The groundwater sample was submitted for analysis of VOC and PHC.

4.8 Sediment: Sampling

As no water body was present at the Phase Two property, sediment sampling was not part of the Phase Two ESA.

4.9 Analytical Testing

Two contracted laboratories selected to perform chemical analysis on all soil samples, Bureau Veritas Laboratories (BV Labs) Caduceon Laboratories. Both laboratories are accredited under the Standards Council of Canada/Canadian Association for Laboratory Accreditation in accordance with ISO/IEC 17025:1999- General Requirements for the Competence of Testing and Calibration Laboratories.

4.10 Residue Management

The drill cuttings from drilling activities were disposed of on the site. Fluids from cleaning drilling equipment were disposed of by the driller at their facility.

4.11 Elevation Surveying

An elevation survey was conducted to obtain vertical control of the borehole locations. The ground surface elevation of each borehole location was surveyed using high precision GPS meter relative to mean sea level.

4.12 Quality Assurance and Quality Control Measures

All soil samples were placed in coolers containing ice packs prior to and during transportation to the contract laboratory, BV Labs and Caduceon Laboratories. Both laboratories are accredited to the ISO/IEC 17025:2005 standard - *General Requirements for the Competence of Testing and Calibration Laboratories*.

A QA/QC program was also implemented to ensure that the analytical results received are accurate and dependable. A QA/QC program is a system of documented checks that validate the reliability of the data. Quality Assurance is a system that ensures that quality control procedures are correctly performed and documented. Quality Control refers to the established procedures observed both in the field and in the laboratory, designed to ensure that the resulting end data meet intended quality objectives. The QA/QC program implemented by EXP incorporated the following components:

- Collecting and analysing field duplicate soil samples to ensure analytical precision;
- Using dedicated and/or disposable sampling equipment;
- Following proper decontamination protocols to minimize cross-contamination;
- Maintaining field notes and completing field forms to document field activities; and
- Using only laboratory-supplied sample containers and following prescribed sample protocols, including using proper preservation techniques, meeting sample hold times, and documenting sample transmission on chains of custody, to ensure the integrity of the samples is maintained.

The laboratory QA/QC program involved the systematic analysis of control standards for the purpose of optimizing the measuring system as well as establishing system precision and accuracy and included calibration standards, method blanks, reference standards, spiked samples, surrogates and duplicates.

5.0 Review and Evaluation

5.1 Geology

The detailed soil profiles encountered during this investigation are provided on the attached borehole logs (Appendix D). Boundaries of soil indicated on the log sheets are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change.

The general stratigraphy at the Phase Two property, as observed in the boreholes, consisted of fill overlying grey limestone bedrock at depth of 0.4 m to 1.6 m bgs. A brief description of the soil stratigraphy at the Phase Two property, in order of depth, is summarized in the following sections.

Fill Material

Fill was observed in all boreholes beneath the pavement structure and consisted of sand and gravel to clayey silt mixed with topsoil inclusions, and cobbles. The fill extended to auger refusal depths in all three boreholes ranging from 0.5 m to 1.6 m. No indications of petroleum impact were identified in the fill. No debris was encountered in the fill material.

The grain size analyses showed that the native material was coarse grained. The results of the grain size analyses are found in Appendix A.

Refer to the geological cross sections in Figures 9 to 11 for an overview of the Phase Two property stratigraphy.

Native Material

No native soil was present on the Phase Two property.

Bedrock

Refusal to augers was met in all the boreholes at depths ranging between 0.4 m to 1.6 m depths (Elevation 63.6 m to 62.2 m). The presence of limestone bedrock was confirmed in BH-1 and BH-3.

5.2 Groundwater: Elevations and Flow Direction

Three standpipes were installed in the boreholes as part of the Geotechnical Investigation. Groundwater elevations and water levels were measured at the Phase Two property on August 30, 2022. Groundwater was encountered at depths ranging from 1.70 m in BH-1 to 3.10 m in BH-3. No petroleum sheens were observed in the monitoring wells during the sampling event.

A summary of the elevation survey and groundwater levels for each well are shown on Table 5.1.

Table 5.1: Groundwater Elevations

Monitoring Well ID	Ground Surface Elevation (MASL)	September 19, 2019		June 7, 2022		August 30, 2022	
		Water Level (m bsg)	Water Level (MASL)	Water Level (m bsg)	Water Level (MASL)	Water Level (m bsg)	Water Level (MASL)
MW-6	64.76	5.65	58.43	-	-	-	-
MW22-1	65.00	-	-	7.57	57.43	-	-

Monitoring Well ID	Ground Surface Elevation (MASL)	September 19, 2019		June 7, 2022		August 30, 2022	
		Water Level (m bsg)	Water Level (MASL)	Water Level (m bsg)	Water Level (MASL)	Water Level (m bsg)	Water Level (MASL)
BH-1	63.85	-	-	-	-	1.70	62.15
BH-3	64.02	-	-	-	-	3.10	60.92

Note: Elevations were referenced using a high precision GPS unit and a geodetic datum.
MASL – metres above sea level

Since there are two groundwater elevations in August 2022, a groundwater flow direction could not be calculated. The groundwater contour plan is provided as Figure 5 in Appendix A. EXP notes that groundwater flow direction and level can be influenced by utility trenches and other subsurface structures and may migrate in the bedding stone of nearby subsurface utility trenches.

5.3 Soil: Field Screening

Field screening involved using the combustible vapour meter to organic vapour concentrations, in ppmv, in the collected soil samples in order to assess the presence of soil gases which would imply VOC impact. The vapour readings obtained during the drilling activities are presented on the borehole logs in Appendix D. The boreholes vapour readings were all zero ppmv. No staining or odours were observed in any of the soil samples.

5.4 Soil: Quality

In accordance with the scope of work, chemical analyses were performed on selected soil samples recovered from the boreholes. The selection of representative "worst case" soil samples from each borehole was based on field visual or olfactory evidence of impacts and/or presence of potential water bearing zones. Summaries of the soil analytical results are found in Appendix D. Copies of the laboratory Certificates of Analysis for the tested soil samples are provided in Appendix F.

The MECP Table 7 SCS are applicable if soil pH is in the range of 5 to 11 for subsurface soil. One soil sample from 1.5 m to 2.9 m was submitted for pH analysis with results of 8.46. This pH value is within the acceptable range for the application of MECP Table 7 SCS.

PHC

Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of PHC and BTEX from the 266 Carruthers Avenue parcel and one soil sample was submitted for the chemical analysis of PHC and BTEX from the 268 Carruthers Avenue parcel. The concentrations of PHC and BTEX measured in the analysed soil samples were less than MECP 2011 Table 7 SCS, as shown in Table 1 in Appendix E, with the exception of PHC F3 and F4 in the soil sample collected from BH-2 SS2 at a depth of 0.15 to 0.75 m. The BTEX and PHC results are shown on Figures 6 and 9 in Appendix A.

VOC

Three (3) soil samples, plus one blind duplicate, were submitted from the 266 Carruthers Avenue parcel for the chemical analysis of VOC. The concentrations of VOC measured in the analysed soil samples were less than MECP 2011 Table 7 SCS, as shown in Table 1 in Appendix B. The VOC results are shown on Figures 6 and 10 in Appendix A.

Metals

Three (3) soil samples, plus one blind duplicate, were submitted from the 266 Carruthers Avenue parcel for the chemical analysis of metals. The concentrations of metals measured in the analysed soil samples were less than the MECP 2011 Table 7 SCS, as shown in Table 2 in Appendix B, with the exception of cadmium, lead, mercury and zinc in all three soil samples. The metals results are shown on Figures 7 and 10 in Appendix A.

PAH

Three (3) soil samples, plus one blind duplicate, were submitted from the 266 Carruthers Avenue parcel for the chemical analysis of PAH. The concentrations of PAH measured in the analysed soil samples were less than the MECP 2011 Table 7 SCS, as shown in Table 3 in Appendix B. The PAH results are shown on Figures 8 and 11 in Appendix A.

5.4 Groundwater: Quality

There were no exceedances of the MECP Table 7 SCS for any of the parameters analysed in groundwater. Analytical results are included in Table 5 in Appendix E.

5.7 Chemical Transformation and Contaminant Sources

A variety of physical, chemical and biochemical mechanisms affect the fate and transport of the potential COC in soil, the contribution of which is dependent on the soil conditions at the Phase Two property, as well as the chemical/physical properties of the COC. Relevant fate and transport mechanisms are natural attenuation mechanisms, including advection mixing, mechanical dispersion/molecular diffusion, phase partitions (i.e. sorption and volatilization), and possibly abiotic or biotic chemical reactions, which effectively reduce COC concentrations.

Prior to remediation, the majority of the soil on site was determined to be contaminated, as PHC fractions F3 and F4, and metals exceeded the applicable Table 7 SCS.

The potential on-site exposure pathways for the construction workers are incidental soil ingestion, soil particulate inhalation, soil dermal contact, ambient vapour inhalation, and vapour skin contact.

The potential on-site exposure pathways for the short-term outdoor workers (who are not exposed directly to subsurface soil and groundwater) are incidental surface soil ingestion, surface soil particulate inhalation, surface soil dermal contact, ambient air inhalation, and vapour skin contact.

The potential on-site exposure pathway for the property residents and visitors is indoor air inhalation.

A diagram identifying the release mechanisms, contaminant transport pathway, human receptors, exposure points and routes of exposure are shown on Figure 12 in Appendix A.

While the footprint of the building that is being planned will occupy most of the Phase Two property, there will be a landscaped area surrounding the building. Therefore, The Phase Two property is capable of supporting some ecological receptors. Relevant ecological receptors include terrestrial vegetation (bushes, grasses and weeds); soil invertebrates (earthworms, millipedes and beetles); birds (seagulls, pigeons, sparrows and robins); and small terrestrial mammals (moles, voles, and mice). Since all pre-remediation groundwater samples were within the Table 7 SCS, groundwater root uptake, groundwater dermal contact, and incidental ingestion of groundwater were not deemed to be potential exposure pathways for any of the potential on-site ecological receptors.

The potential on-site exposure pathways for terrestrial vegetation are root uptake of soil and stem and foliar uptake of vapours from soil.

The potential on-site exposure pathways for soil invertebrates are soil particulate inhalation, soil dermal contact, soil ingestion, and vapour inhalation, and plant and animal tissue ingestion.

The potential on-site exposure pathways for mammals and birds are soil particulate inhalation, soil dermal contact, soil ingestion, vapour inhalation, and plant and animal tissue ingestion.

A diagram identifying the release mechanisms, contaminant transport pathway, ecological receptors, exposure points and routes of exposure are shown on Figure 13 in Appendix A.

5.6.3 Evidence of Non-Aqueous Phase Liquid

Inspection of the soil cores retrieved from the boreholes did not indicate the presence of non-aqueous phase liquid (NAPL), staining or sheen. Odours were not observed during soil sampling activities. NAPLs are not expected to be present at the Phase Two property.

5.6.4 Maximum Concentrations

The maximum groundwater concentrations are provided in Table 4 and 6 in Appendix E.

5.7 Sediment: Quality

As there were no water bodies on the Phase Two property, surface water and sediment sampling were not required.

5.8 Quality Assurance and Quality Control Results

Caduceon Laboratories' / BV Labs' QA/QC program consisted of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences and surrogate compound recoveries to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificates of Analysis. The QA/QC results are reported as percent recoveries for matrix spikes, spiked blanks and QC standards, relative percent difference for laboratory duplicates and analyte concentrations for method blanks.

A review of field activity documentation indicated that recommended sample volumes were collected from soil for each analytical test group into appropriate containers and preserved with proper chemical reagents in accordance with the protocols set out in the Protocol for Analytical Methods used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (MOE, 2011). Samples were preserved at the required temperatures in insulated coolers and met applicable holding time requirements, when relinquished to the receiving laboratory.

For QA/QC purposes, the analytical sample results are quantitatively evaluated by calculating the relative percent difference (RPD) between the samples and their duplicates. To accurately calculate a statistically valid RPD, the concentration of the analytes found in both the original and duplicate sample must be greater than five times the reporting detection limit (RDL).

The results of the RPD calculations are provided in Tables 7 to 9 in Appendix E. All of the RPD were either not calculable or within the applicable alert limits, with the exception of PHC F4. The PHC RPD indicates a heterogeneity in the two soil samples.

Certificates of Analysis (COA) were received from Caduceon reporting the results of all the chemical analyses performed on the submitted soil and groundwater. Copies of the COA are provided in Appendix F. A review of the Certificates of Analysis prepared by BV labs indicates that they were in compliance with the requirements set out under subsection 47(3) of Ontario Regulation 153/04 (as amended).

Review of the laboratory QA/QC results reported indicated that they were all within acceptable control limits or below applicable alert criteria for the sampled media and analytical test groups. Based on the assessment of the QA/QC, the analytical results reported by Caduceon labs are of acceptable quality and further data qualifications are not required.

5.9 Phase Two Conceptual Site Model

This section presents a Conceptual Site Model (CSM) providing a narrative, graphical and tabulated description integrating information related to the Phase Two property's geologic and hydrogeological conditions, areas of potential environmental concern/potential contaminating activities, the presence and distribution of contaminants of concern, contaminant fate and transport, and potential exposure pathways.

5.9.1 Introduction

EXP Services Inc. (EXP) was retained by McCormick Park Developments Incorporated to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 266 and 268 Carruthers Avenue in Ottawa, Ontario hereinafter referred to as the 'Phase Two property'. The objective of the Phase Two ESA investigation is to assess the quality of the soil conditions within the area of potential environmental concern (APEC) identified in a Phase One ESA prepared by EXP.

The most recent use of the property is residential, and the proposed future use is also residential. Therefore, as per Ontario Regulation 153/04, a Record of Site Condition (RSC) is not required.

5.9.2 Physical Site Description

The Phase Two property has the municipal address of 266 and 268 Carruthers Avenue. The Phase Two property is located within a residential neighbourhood on the west side of Carruthers Avenue, approximately 40 m north of Armstrong Street. The Phase Two property is L-shaped and has an area of 0.04 hectares. A Site Location Plan is provided as Figure 1 in Appendix B.

The Phase Two property has the property identification numbers (PIN) 04094-0152 and PIN 04094-0339. The legal description of the Phase Two property is Part Lot 6 and 7 Plan 83 on CR574373 and Part 1 on Plan 4R33847; City of Ottawa.

Topographically, the Phase Two property is relatively flat. The surrounding area has a slight slope down towards the north. Regional groundwater flow direction is inferred to be in a northerly direction towards the Ottawa River, found approximately 1 km to the north.

Refer to Table 5.1 for the Site identification information.

Table 5.1: Site Identification Details

Civic Address	266 and 268 Carruthers Avenue, Ottawa, Ontario
Current Land Use	Residential
Proposed Future Land Use	Residential
Property Identification Number	04094-0152 and 04094-0339
UTM Coordinates	NAD83 Zone 18, 443058 m E, 5028006 m N
Site Area	0.04 hectares
Property Owner	McCormick Park Developments Incorporated

Potable water is available from the City of Ottawa. There are no potable water wells within the Phase Two study area. There are no water bodies on the subject site. The Ottawa River is located approximately 1 km north of the Phase One property. The regional groundwater flow is inferred to be northerly, towards the river.

In accordance with Section 41 of the Ontario Regulation 153/04 (as amended), the Phase Two property is not an environmentally sensitive area. In addition, the Phase Two property is not located within an area of natural significance and it does not include land that is within 30 metres of an area of natural significance.

The Phase Two property is a shallow soil property as defined in Section 43.1 of the regulation. It does not include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

5.9.3 Geological and Hydrogeological

Bedrock in the general area of the Phase Two property consists of limestone of the Ottawa Formation. Native surficial soil consists of sand and silt overlying shallow bedrock.

A 75 mm to 350 mm layer of granular fill was observed at the ground surface of several boreholes. Soil at the Phase Two property prior to remediation generally consisted of sand and gravel fill material. The fill layer ranged in thickness from 0.4 to 1.6 m and was encountered in all boreholes. Limestone bedrock was present underlying the fill material. No native soil was present at the Phase Two property.

Groundwater was encountered at depths ranging from 1.70 metres in BH-1 to 3.10 m in BH-3 in August 2022. The groundwater flow direction could not be calculated since there were only two water levels available on the Phase Two property in August 2022. The groundwater elevations are shown on Figure 5. Groundwater levels can also be influenced by seasonal changes, the presence of subsurface structures, or fill, however, as the water table is in the bedrock, it is unlikely that any of these factors will affect the groundwater flow direction at the Phase Two property.

A plan view showing the cross-section location is provided as Figure 5, while the Phase Two property geology is depicted in cross-sections on Figures 9 to 11.

A summary of factors that apply to the Phase Two property is provided in Table 5.2

Table 5.2: Site Characteristics

Characteristic	Description
Minimum Depth to Bedrock	0.4 mbgs
Minimum Depth to Overburden Groundwater	1.70 mbgs (August 30, 2022)
Shallow Soil Property	Yes, bedrock is less than 2.0 mbgs
Proximity to water body or ANSI	900 m north
Soil pH	8.28
Soil Texture	Coarse
Current Property Use	Residential
Future Property Use	Residential
Proposed Future Building	Residential
Areas Containing Suspected Fill	Entire site

5.9.4 Utilities

The Phase Two property is not currently serviced. However, surrounding properties are serviced by municipal sewer and water, and natural gas. Since the water table is within the bedrock, it is unlikely that any of these factors will affect the groundwater flow direction at the Phase Two property.

A multi-storey residential building with one basement level is planned for construction on the Phase Two property.

5.9.5 Potentially Contaminating Activities

The following on-site potentially contaminating activities (PCA) were identified:

- **PCA 1** – 179 Armstrong Street (30 m south) – Commercial building had a UST on the north side of the building as per the 1956 FIP (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 2** – 1092 – 1096 Wellington Street (160 m southeast) – Former gasoline service station with two fuel USTs (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 3** – 177 Armstrong Street (30 m south) – Former furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 4** – 179 Armstrong Street (30 m south) – Former furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 5** – 269 Carruthers Avenue (10 m south) – Former furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks);
- **PCA 6** – 180 Armstrong Street (40 m south) – Former automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 7** – 1 Grant Street (60 m south) – Active automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 8** – 271 Carruthers Avenue (20 m southeast) – Former automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 9** – 1119 Wellington Street (110 m southeast) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 10** – 1125 Wellington Street (120 m south) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 11** – 1097 Wellington Street (130 m southeast) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 12** – 1104 Wellington (130 m south) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 13** – 1141/1149 Wellington Street (115 m south) – Former automotive service garage and service station (PCA #10 – Commercial Autobody Shop, PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 14** – 131 Armstrong Street (130 m east) – Former automotive service garage (PCA #10 – Commercial Autobody Shop);
- **PCA 15** – 1175 Wellington Street (215 m southwest) – Former gas station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 16** – 300 Parkdale Avenue (240 m west) – Commercial printing operation (PCA #Other);

- **PCA 17** – 1065 Wellington Street (240 m east) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 18** – 1067 Wellington Street (240 m east) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 19** – 380 Parkdale Avenue (220 m southwest) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 20** – 390 Parkdale Avenue (220 m southwest) – Former gass station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 21** – 172 Carruthers Avenue (250 m north) – Hydro One substation (PCA #55 – Transformer Manufacturing, Processing and Use);
- **PCA 22** – 103 Pinhey Street (170 m east) – Former smelting and refining operation (PCA #35 – Mining, Smelting and Refining);
- **PCA 23** –1132 Wellington Street (210 m southeast) – Former gas station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 24** – 1134 Wellington Street (210 m south) – Former automotive service garage, former dry cleaner (PCA #10 – Commercial Autobody Shop, PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 25** – 1124 Wellington Street (170 m southeast) – Former gas station (PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks;
- **PCA 26** – 1120 Wellington Street (125 southeast) – Former Chinese laundry, former gas station (PCA #37 – Operation of Dry-Cleaning Equipment, PCA #28 – Gasoline and Associated Products Stored in Fixed Tanks);
- **PCA 27** – 1112 Wellington Street (170 southeast) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 28** – 1091 Wellington Street (130 m southeast) – Former Chinese laundry (PCA #37 – Operation of Dry-Cleaning Equipment).
- **PCA 29** – 1069 Wellington Street (240 m east) – Former dry cleaner (PCA #37 – Operation of Dry-Cleaning Equipment);
- **PCA 30** – Phase Two property – Fill material is present throughout the Phase One property (PCA #30 – Importation of Fill Material of Unknown Quality); and,
- **PCA 31** – Phase Two property – Furnace oil AST in the basement (PCA #28 – Gasoline and Associated Products Storage in Fixed Tanks).

Any PCAs located significantly distant (greater than 100 m) from the Phase Two property were considered to be too distant to be contributing to an APEC. **PCA 2**, and **PCA 9** through **PCA 29** were located greater than 100 m from the Phase Two property, and therefore not considered to result in an APEC.

Furthermore, based on previous subsurface investigation on adjacent properties to the south, the inferred groundwater flow direction at the Phase Two property is to the northwest. Therefore, the properties within the Phase One study area northwest of the Phase Two property were considered to be hydraulically down-gradient of the Phase Two property; and the properties to the north, east, and west of the Phase Two property were considered to be hydraulically cross-gradient to the Phase Two property.

Previous subsurface investigations on the south adjacent property in 2019 assessed soil and groundwater impacts associated with **PCA 1**, and **PCA 3** through **PCA 7**. No groundwater samples on the south adjacent property were impacted, including

samples taken from adjacent to the Phase Two property line. Therefore, no potential groundwater contaminants from these PCAs have migrated onto the Phase Two property, and do not contribute to APECs.

The HLUI search identified a former repair garage at 271 Carruthers Avenue (**PCA 8**). A residence was constructed at 271 Carruthers Avenue prior to 1902 and was present until at leas 1956. In addition, the property is listed in the city directories as residential for all of the years reviewed. It is unlikely that this property ever operated as a repair garage.

The furnace oil AST (**PCA 31**), as well as the concrete floor beneath the AST, were observed to be in good condition. The current tenant has occupied the residence since 1969. The furnace oil AST has been replaced three times in this time frame, and not spills or leaks have been noted. Therefore, the presence of the AST does not result in an APEC.

Therefore, the only PCA which results in an APEC is **PCA 30**, the presence of fill of unknown quality at the Phase Two property.

5.9.6 Areas of Potential Environmental Concern/Potential Contaminants of Concern

Ontario Regulation 153/04 defines an APEC as an area on a property where one or more contaminants are potentially present. Based on this Phase One ESA, the following APEC was identified:

Area of Potential Environmental Concern (APEC)	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1	Entire Phase Two property	PCA#30 – Importation of Fill Material of Unknown Quality	On-Site	petroleum hydrocarbons (PHC), volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), metals	Soil

5.9.7 Investigation

The Phase Two ESA was conducted to assess the soil quality at the Phase Two property.

Prior to the commencement of drilling, the locations of underground public utilities including telephone, natural gas and electrical lines were marked at the subject property by public locating companies. A private utility locating contractor was also retained to clear the individual borehole locations.

On August 30, 2019, BH-5 and MW-6 were advanced at the Phase Two property by Marathon Drilling, a licensed well contractor, under the full-time supervision of EXP staff. A groundwater monitoring well was installed in MW-6. A truck mounted CME drill rig with split spoon samplers was used to collect the soil samples.

A post-remedial drilling investigation was conducted on the 268 Carruthers Avenue parcel on May 11, 2022, by Strata Drilling Group (Strata). Strata advanced one borehole (MW22-1) on the Phase Two property, using a GM 100 track mount drill. The borehole was drilled to a depth of 6.3 m bgs. All soil was removed from the 268 Carruthers Avenue parcel and the borehole was cored through bedrock.

On July 22, 2022, EXP oversaw drilling of three (3) boreholes (BH-1 to BH-3) on the Phase Two property as part of a Geotechnical Investigation using a CME-55 truck-mounted drill rig equipped with continuous flight hollow-stem auger and rock coring equipment. The borehole locations are shown on Figure 4 in Appendix C. The boreholes were advanced using a rotary drilling rig, and samples collected using a split spoon sampler at 1.2 m intervals. Sampling for environmental purposes was only conducted on the fill samples collected from the boreholes.

No groundwater APECs were identified on the 266 Carruthers Avenue parcel and therefore, no groundwater samples were collected for laboratory analysis from that parcel. A groundwater sample was collected from MW-6 on 268 Carruthers Avenue in 2019 via a low flow sampling

Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of PHC, VOC, PAH, and metals from the 266 Carruthers Avenue parcel and one soil sample was submitted for the chemical analysis of PHC and BTEX from the 268 Carruthers Avenue parcel.

The concentrations of PHC and BTEX measured in the analysed soil samples were less than MECP 2011 Table 7 SCS, as shown in Table 1 in Appendix E, with the exception of PHC F3 and F4 in the soil sample collected from BH-2 SS2 at a depth of 0.15 to 0.75 m. The BTEX and PHC results are shown on Figures 6 and 9 in Appendix A.

The concentrations of VOC measured in the analysed soil samples were less than MECP 2011 Table 7 SCS, as shown in Table 1 in Appendix B.

The concentrations of metals measured in the analysed soil samples were less than the MECP 2011 Table 7 SCS, as shown in Table 2 in Appendix B, with the exception of cadmium, lead, mercury and zinc in all three soil samples. The metals results are shown on Figures 7 and 10 in Appendix A.

The concentrations of PAH measured in the analysed soil samples were less than the MECP 2011 Table 7 SCS, as shown in Table 3 in Appendix B. The PAH results are shown on Figures 8 and 11 in Appendix A.

There were no exceedances of the MECP Table 7 SCS for any of the parameters analysed in groundwater. Analytical results are included in Table 5 in Appendix E.

5.9.8 Contaminants of Concern

Prior to remediation, all soil on site was determined to be contaminated. No contaminated groundwater was encountered. Contaminants that exceeded the applicable standards included:

Soil: PHC fractions F3 and F4, cadmium, lead, mercury and zinc.

Groundwater: No groundwater samples exceeded the Table 7 SCS.

5.9.9 Contaminant Fate and Transport

A variety of physical, chemical and biochemical mechanisms affect the fate and transport of the potential COC in soil, the contribution of which is dependent on the soil conditions at the Phase Two property, as well as the chemical/physical properties of the COC. Relevant fate and transport mechanisms are natural attenuation mechanisms, including advection mixing, mechanical dispersion/molecular diffusion, phase partitions (i.e. sorption and volatilization), and possibly abiotic or biotic chemical reactions, which effectively reduce COC concentrations.

Prior to remediation, the majority of the soil on site was determined to be contaminated, as PHC fractions F3 and F4, and metals exceeded the applicable Table 7 SCS.

The potential on-site exposure pathways for the construction workers are incidental soil ingestion, soil particulate inhalation, soil dermal contact, ambient vapour inhalation, and vapour skin contact.

The potential on-site exposure pathways for the short-term outdoor workers (who are not exposed directly to subsurface soil and groundwater) are incidental surface soil ingestion, surface soil particulate inhalation, surface soil dermal contact, ambient air inhalation, and vapour skin contact.

The potential on-site exposure pathway for the property residents and visitors is indoor air inhalation.

A diagram identifying the release mechanisms, contaminant transport pathway, human receptors, exposure points and routes of exposure are shown on Figure 12 in Appendix A.

While the footprint of the building that is being planned will occupy most of the Phase Two property, there will be a landscaped area surrounding the building. Therefore, The Phase Two property is capable of supporting some ecological receptors. Relevant ecological receptors include terrestrial vegetation (bushes, grasses and weeds); soil invertebrates (earthworms, millipedes and beetles); birds (seagulls, pigeons, sparrows and robins); and small terrestrial mammals (moles, voles, and mice). Since all pre-remediation groundwater samples were within the Table 7 SCS, groundwater root uptake, groundwater dermal contact, and incidental ingestion of groundwater were not deemed to be potential exposure pathways for any of the potential on-site ecological receptors.

The potential on-site exposure pathways for terrestrial vegetation are root uptake of soil and stem and foliar uptake of vapours from soil.

The potential on-site exposure pathways for soil invertebrates are soil particulate inhalation, soil dermal contact, soil ingestion, and vapour inhalation, and plant and animal tissue ingestion.

The potential on-site exposure pathways for mammals and birds are soil particulate inhalation, soil dermal contact, soil ingestion, vapour inhalation, and plant and animal tissue ingestion.

A diagram identifying the release mechanisms, contaminant transport pathway, ecological receptors, exposure points and routes of exposure are shown on Figure 13 in Appendix A.

6.0 Conclusion

Based on the Phase Two ESA results, the following summary is provided:

- The Phase Two ESA consisted of advancing a total of six (6) boreholes to investigate the quality of fill on the property which was identified in this Phase One and Two ESA. Two monitoring wells were installed on the Phase Two property. A worst-case sample of the fill material from four of the boreholes was submitted for laboratory analysis of PHCs, VOC, PAH, and/or metals. A groundwater sample was collected from MW-6 and submitted for laboratory analysis of PHC and VOC.
- A 75 mm to 350 mm layer of granular fill was observed at the ground surface of several boreholes. Soil at the Phase Two property prior to remediation generally consisted of sand and gravel fill material. The fill layer ranged in thickness from 0.4 to 1.6 m and was encountered in all boreholes. Limestone bedrock was present underlying the fill material. No native soil was present at the Phase Two property.
- Groundwater was encountered at depths ranging from 1.70 m in BH-1 to 3.10 m in BH-3 in August 2022. The groundwater flow direction could not be calculated since there were only two water levels available on the Phase Two property in August 2022.
- Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of PHC, VOC, PH, and metals, from the 266 Carruthers Avenue parcel and one soil sample was submitted for the chemical analysis of PHC and BTEX from the 268 Carruthers Avenue parcel. The concentrations of PHC and BTEX measured in the analysed soil samples were less than MECP 2011 Table 7 SCS, as shown in Table 1 in Appendix B, with the exception of PHC F3 and F4 in the soil sample collected from BH-2 SS2 at a depth of 0.15 to 0.75 m and cadmium, lead, mercury and zinc in all three soil samples. Based on these results, the fill on the property is considered to be impacted.
- The concentrations of VOC and PHC in the analyzed groundwater sample were less than the 2011 MECP Table 7 SCS.

The Qualified Person can confirm that the Phase Two Environmental Site Assessment was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices.

7.0 References

This study was conducted in accordance with the applicable Regulations, Guidelines, Policies, Standards, Protocols and Objectives. Specific reference is made to the following documents.

- ASTM International, D5299/D5299M-17, *Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities*, 2017.
- Canadian Council of Ministers of the Environment, *Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites,* 1993.
- Canadian Council of Ministers of the Environment, *A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines,* 2006.
- Canadian Council of Ministers of the Environment, *Canada Wide Standards for Petroleum Hydrocarbons in Soil*, 2008.
- Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, http://www.ccme.ca/en/resources/canadian_environmental_quality_guidelines, Accessed November 2018.
- EXP Services Inc., *Phase One Environmental Site Assessment, 266 and 268 Carruthers Avenue, Ottawa, Ontario,* June 7, 2022.
- Freeze and Cherry, *Groundwater*, Prentice Hall, 1979.
- Ontario Ministry of the Environment, Conservation and Parks, *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*, December 1996.
- Ontario Ministry of the Environment, Conservation and Parks, *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, April 15, 2011.
- Ontario Ministry of the Environment, Conservation and Parks, *Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04,* June 2011.
- Ontario Ministry of the Environment, Conservation and Parks, *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* July 1, 2011.
- Ontario Ministry of the Environment, Conservation and Parks, *Management of Excess Soil – A Guide for Best Management Practices,* January 2014.
- Ontario Regulation 153/04, made under the *Environmental Protection Act*, as amended.
- Ontario R.R.O. 1990, Regulation 347, made under the *Environmental Protection Act*, as amended.
- Ontario R.R.O. 1990, Regulation 903, made under the *Water Resources Act*, as amended.

8.0 General Limitations

Basis of Report

This report ("Report") is based on site conditions known or inferred by the investigation undertaken as of the date of the Report. Should changes occur which potentially impact the condition of the site the recommendations of EXP may require re-evaluation. Where special concerns exist, or McCormick Park Developments Incorporated ("the Client") has special considerations or requirements, these should be disclosed to EXP to allow for additional or special investigations to be undertaken not otherwise within the scope of investigation conducted for the purpose of the Report.

Reliance on Information Provided

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to EXP by the Client and others. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by the Client. EXP has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to exp. If new information about the environmental conditions at the Site is found, the information should be provided to EXP so that it can be reviewed and revisions to the conclusions and/or recommendations can be made, if warranted.

Standard of Care

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

Complete Report

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to EXP by the Client, communications between EXP and the Client, other reports, proposals or documents prepared by EXP for the Client in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. EXP is not responsible for use by any party of portions of the Report.

Use of Report

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the written consent of EXP. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. EXP is not responsible for damages suffered by any third party resulting from unauthorised use of the Report.

Report Format

Where EXP has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by EXP utilize specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and

hardware systems. Regardless of format, the documents described herein are EXP's instruments of professional service and shall not be altered without the written consent of EXP.

10.0 Signatures

We trust this report meets your current needs. If you have any questions pertaining to the investigation undertaken by EXP, please do not hesitate to contact the undersigned. The Qualified Person can confirm that the Phase One Environmental Site Assessment was conducted per the requirements of Ontario Regulation 153/04, as amended, and in accordance with generally accepted professional practices.

Leah Wells, P.Eng.
Environmental Engineer
Earth and Environment

Mark McCalla, P.Geo.
Senior Project Manager
Earth and Environment

PROFESSIONAL GEOSCIENTIST
MARK G. McCALLA
PRACTISING MEMBER
0451
Sept 27/22
ONTARIO

Appendix A: Figures

0 40m 80m 160m

HORIZONTAL 1:4000

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DESIGN: MM / CHECKED: CH		scale: 1:4,000
DRAWN BY: AS	TITLE: SITE LOCATION PLAN	FIG 1

Filename: E:\OTT\OTT-22009213-C0\60 Execution\65 Drawings\Phase Two ESA\22009213-C0_Ph-II.dwg
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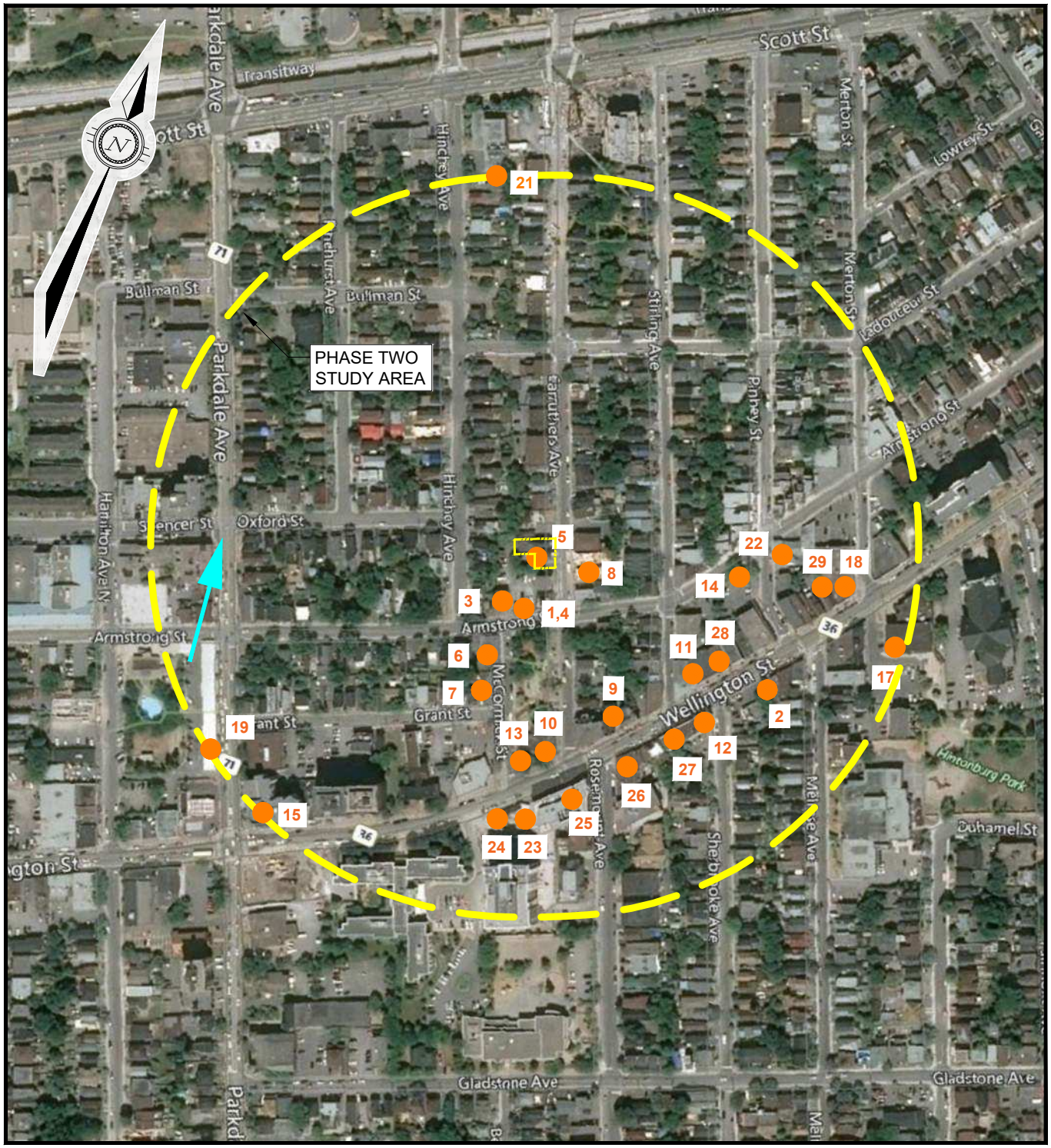

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0 40m 80m 160m

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LEGEND

- PROPERTY BOUNDARIES
- PHASE ONE ESA STUDY AREA (250m)
- PCA-1 PCA IDENTIFIER
- INFERRED GROUNDWATER FLOW DIRECTION

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DESIGN: M.M. / CHECKED: C.H.		scale: 1:4000
DRAWN BY: MZG / AS	TITLE: PHASE TWO STUDY AREA	FIG 2

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LEGEND

- PROPERTY(IES) BOUNDARIES
- BH-1 — BOREHOLE NUMBER AND LOCATION (*EXP*, 2022)
- MW22-1 — POST-REMEDIATION MONITORING WELL NUMBER AND LOCATION (*EXP*, 2022)
- BH-5 — PRE-REMEDIATION BOREHOLE NUMBER AND LOCATION (*EXP*, 2019)
- MW-6 — PRE-REMEDIATION MONITORING WELL / STANDPIPE NUMBER AND LOCATION (*EXP*, 2019)
- (64.01) GROUND ELEVATION
- [63.46] BEDROCK ELEVATION
- {63.55} AUGER REFUSAL ELEVATION
- APEC 1 - PCA #30 - IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY
- APEC 2 - PCA #28 - GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE: AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

project no. OTT-22009213-C0
scale 1:200
FIG 3

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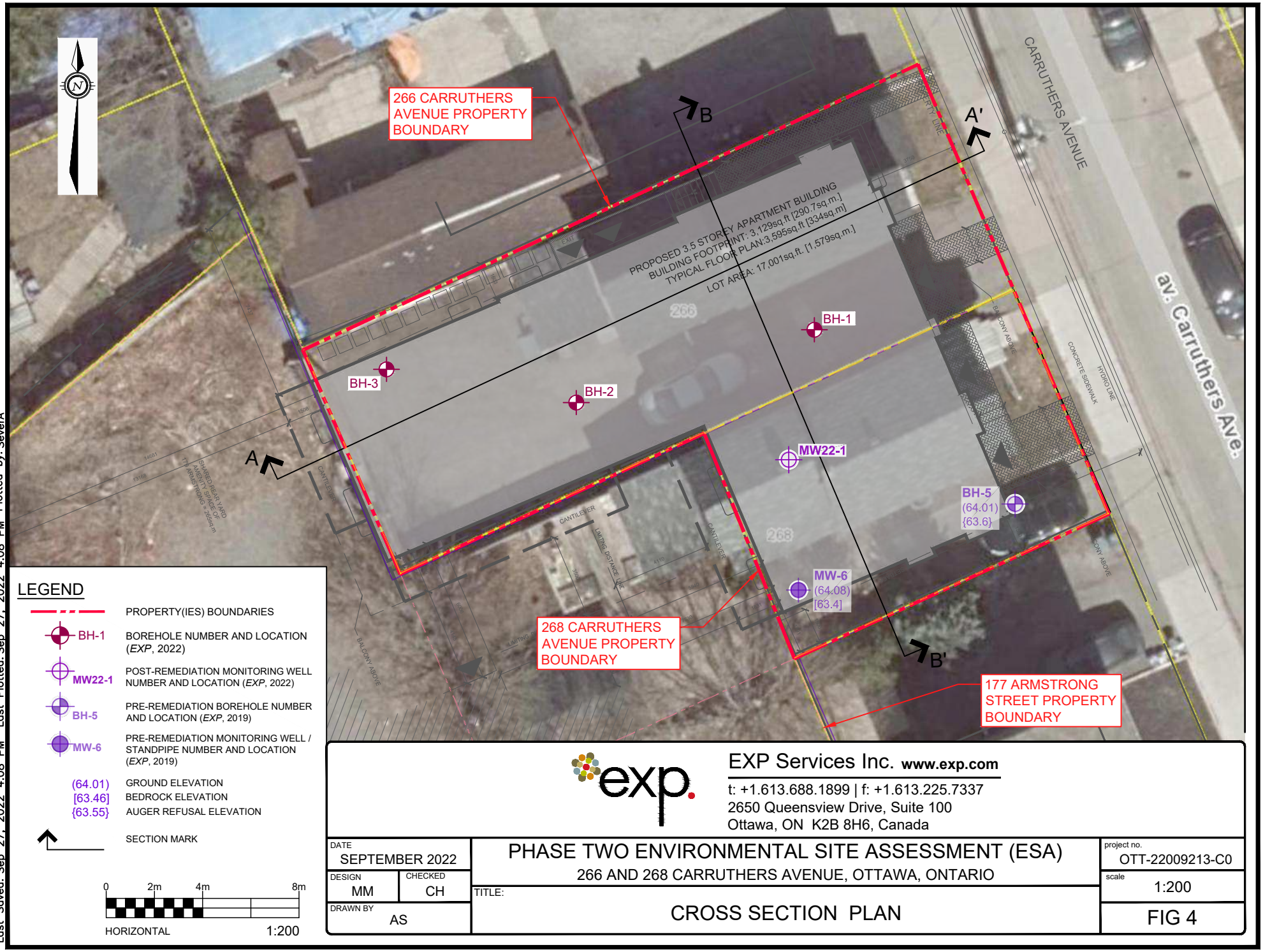

LEGEND

- PROPERTY(IES) BOUNDARIES
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- BH-5 — PRE-REMEDIATION BOREHOLE NUMBER AND LOCATION (*EXP*, 2019)
- MW-6 — PRE-REMEDIATION MONITORING WELL / STANDPIPE NUMBER AND LOCATION (*EXP*, 2019)
- (64.01) GROUND ELEVATION
- [63.46] BEDROCK ELEVATION
- {63.55} AUGER REFUSAL ELEVATION
- SECTION MARK

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE: CROSS SECTION PLAN

project no. OTT-22009213-C0
scale 1:200
FIG 4

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- MW22-1 — POST-REMEDIATION MONITORING WELL NUMBER AND LOCATION (*EXP*, 2022)
- BH-5 — PRE-REMEDIATION BOREHOLE NUMBER AND LOCATION (*EXP*, 2019)
- MW-6 — PRE-REMEDIATION MONITORING WELL / STANDPIPE NUMBER AND LOCATION (*EXP*, 2019)
- (64.01) — GROUND ELEVATION
- [63.46] — BEDROCK ELEVATION
- {63.55} — AUGER REFUSAL ELEVATION
- (62.15) — GROUNDWATER ELEVATION (2022)
- INFERRED GROUNDWATER FLOW DIRECTION

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DESIGN: MM / CHECKED: CH	266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO	scale: 1:200
DRAWN BY: AS	TITLE: GROUNDWATER ELEVATION AND CONTOUR PLAN	FIG 5

Filename: E:\OTT\OTT-22009213-C0\60 Execution\65 Drawings\Phase Two ESA\22009213-C0_Ph-II.dwg
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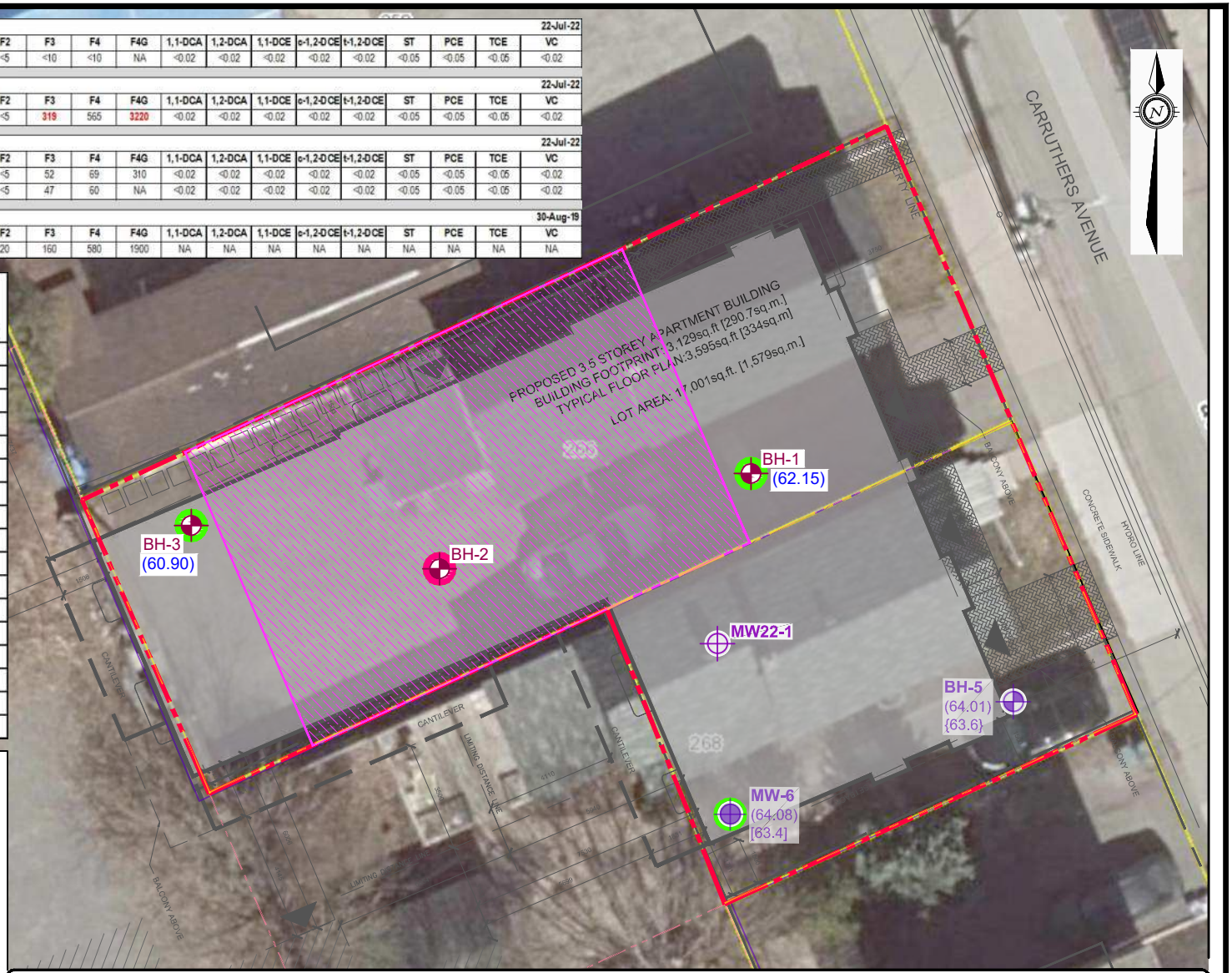
BH-1	Depth (m bgs)																	22-Jul-22
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
SS2	0.15 - 0.75	<0.02	<2	<0.05	<0.03	<10	<5	<10	<10	NA	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02

BH-2	Depth (m bgs)																	22-Jul-22
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
SS2	0.15 - 0.5	<0.02	<2	<0.05	<0.03	<10	<5	319	565	3220	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02

BH3	Depth (m bgs)																	22-Jul-22
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
GS3	0.35 - 0.45	<0.02	<2	<0.05	<0.03	<10	<5	52	69	310	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02
Dup1	0.35 - 0.45	<0.02	<2	<0.05	<0.03	<10	<5	47	60	NA	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02

MW-6	Depth (m bgs)																	30-Aug-19
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
SS1	0.0 - 0.6	<0.02	<0.02	<0.02	<0.04	<10	20	160	580	1900	NA	NA	NA	NA	NA	NA	NA	NA	NA

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 7 STANDARDS
Benzene	B	0.5
Toluene	T	320
Ethylbenzene	E	54
Total Xylenes	X	72
F1	F1 (C6-C10)	420
F2	F2 (C10-C16)	150
F3	F3 (C16-C34)	500
F4	F4 (C34-C50)	500
Chloroform	CF	2
1,1-Dichloroethane	1,1-DCA	11
1,2-Dichlororethane	1,2-DCA	0.5
1,1-Dichloroethylene	1,1-DCE	0.5
Cis-1,2-Dichloroethylene	c-1,2-DCE	1.6
Trans-1,2,-Dichlorothylene	t-1,2-DCE	1.6
Tetrachloroethylene	PCE	0.5
Trichloroethylene	TCE	0.5
Vinyl Chloride	VC	0.5



LEGEND

- PROPERTY(IES) BOUNDARIES
- BH-1 — BOREHOLE NUMBER AND LOCATION (*EXP*, 2022)
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- BH-5 — PRE-REMEDIATION BOREHOLE NUMBER AND LOCATION (*EXP*, 2019)
- MW-6 — PRE-REMEDIATION MONITORING WELL / STANDPIPE NUMBER AND LOCATION (*EXP*, 2019)
- SOIL QUALITY MEETS MECP TABLE 7 SCS
- SOIL QUALITY EXCEEDS MECP TABLE 7 SCS
- ESTIMATED AREA OF IMPACTED SOIL

0 2m 4m 8m

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE:

SOIL ANALYTICAL RESULTS - PHC AND VOC

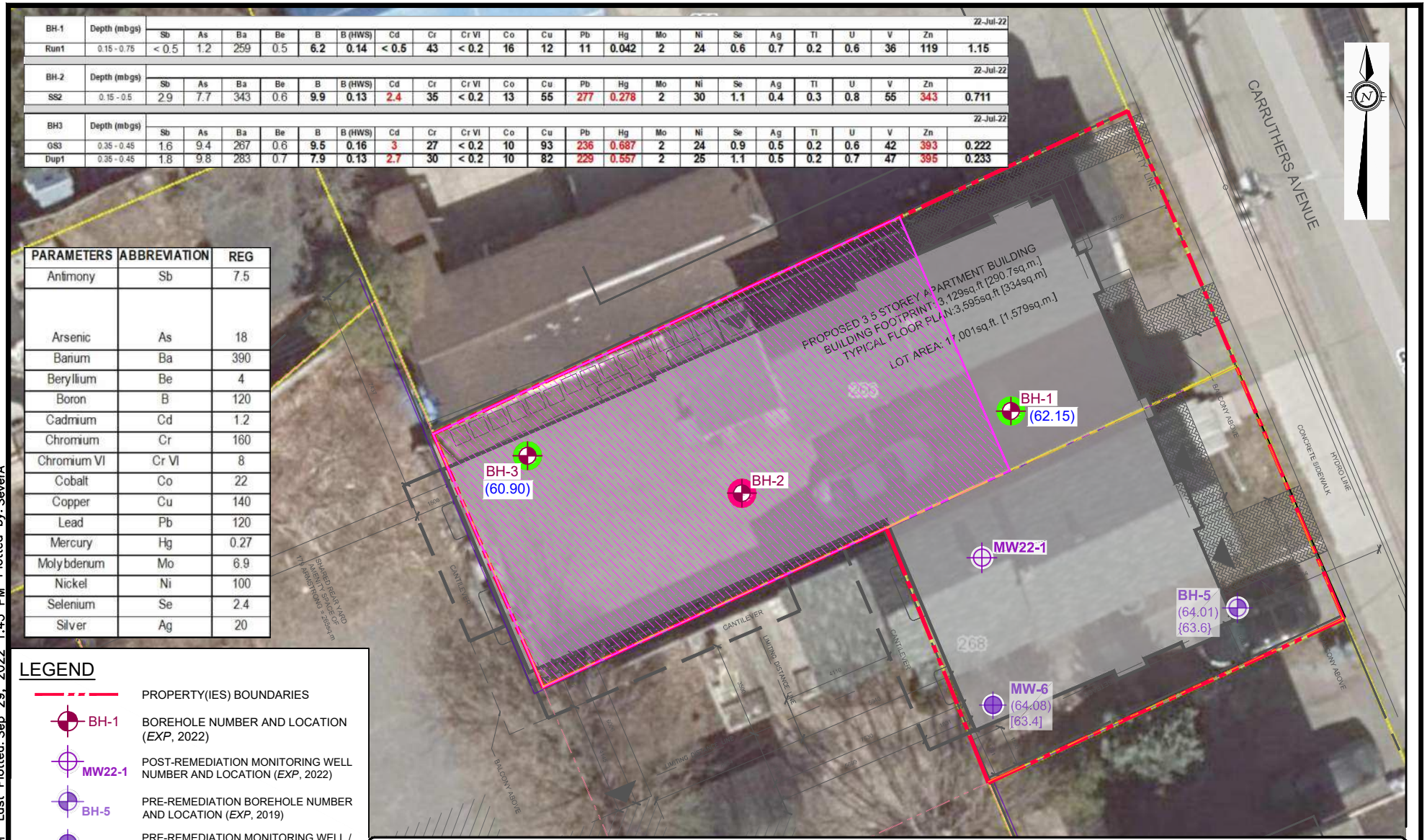
project no. OTT-22009213-C0
scale 1:200
FIG 6

BH-1	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	22-Jul-22
Run1	0.15 - 0.75	< 0.5	1.2	259	0.5	6.2	0.14	< 0.5	43	< 0.2	16	12	11	0.042	2	24	0.6	0.7	0.2	0.6	36	119	1.15

BH-2	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	22-Jul-22
SS2	0.15 - 0.5	2.9	7.7	343	0.6	9.9	0.13	2.4	35	< 0.2	13	55	277	0.278	2	30	1.1	0.4	0.3	0.8	55	343	0.711

BH3	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	22-Jul-22
GS3	0.35 - 0.45	1.6	9.4	267	0.6	9.5	0.16	3	27	< 0.2	10	93	236	0.687	2	24	0.9	0.5	0.2	0.6	42	393	0.222
Dup1	0.35 - 0.45	1.8	9.8	283	0.7	7.9	0.13	2.7	30	< 0.2	10	82	229	0.557	2	25	1.1	0.5	0.2	0.7	47	395	0.233

PARAMETERS	ABBREVIATION	REG
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Chromium VI	Cr VI	8
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Mercury	Hg	0.27
Molybdenum	Mo	6.9
Nickel	Ni	100
Selenium	Se	2.4
Silver	Ag	20



LEGEND

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- BH-5 — PRE-REMEDIATION BOREHOLE NUMBER AND LOCATION (*EXP*, 2019)
- MW-6 — PRE-REMEDIATION MONITORING WELL / STANDPIPE NUMBER AND LOCATION (*EXP*, 2019)
- SOIL QUALITY MEETS MECP TABLE 7 SCS
- SOIL QUALITY EXCEEDS MECP TABLE 7 SCS
- ESTIMATED AREA OF IMPACTED SOIL

0 2m 4m 8m

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE: SOIL ANALYTICAL RESULTS - METALS

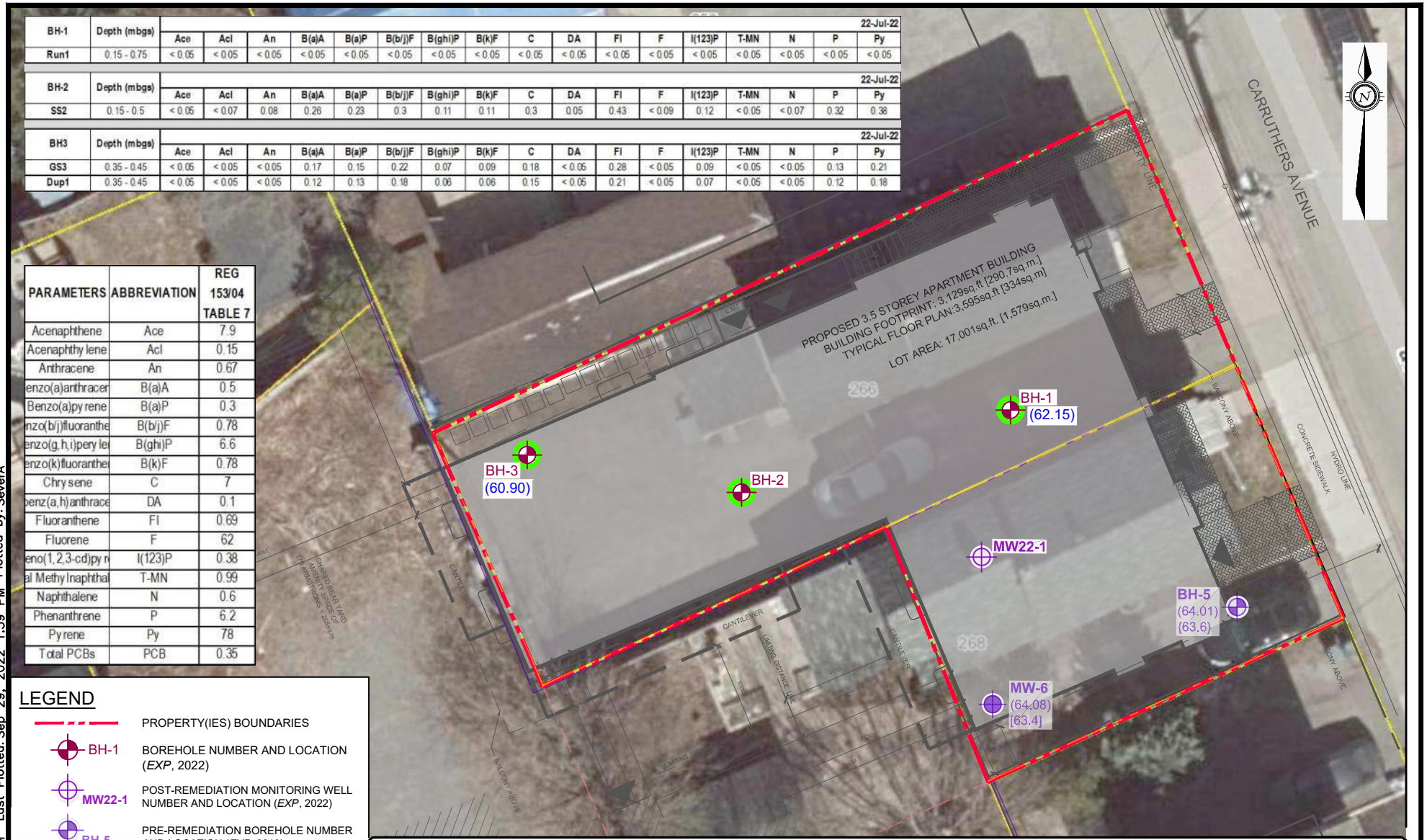
project no. OTT-22009213-C0
scale 1:200
FIG 7

BH-1	Depth (mbgs)	22-Jul-22																
		Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
Run1	0.15 - 0.75	< 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	< 0.05

BH-2	Depth (mbgs)	22-Jul-22																
		Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
SS2	0.15 - 0.5	< 0.05	< 0.07	0.08	0.26	0.23	0.3	0.11	0.11	0.3	0.05	0.43	< 0.09	0.12	< 0.05	< 0.07	0.32	0.38

BH3	Depth (mbgs)	22-Jul-22																
		Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
GS3	0.35 - 0.45	< 0.05	< 0.05	< 0.05	0.17	0.15	0.22	0.07	0.09	0.18	< 0.05	0.28	< 0.05	0.09	< 0.05	< 0.05	0.13	0.21
Dup1	0.35 - 0.45	< 0.05	< 0.05	< 0.05	0.12	0.13	0.18	0.06	0.06	0.15	< 0.05	0.21	< 0.05	0.07	< 0.05	< 0.05	0.12	0.18

PARAMETERS	ABBREVIATION	REG 153/04 TABLE 7
Acenaphthene	Ace	7.9
Acenaphthylene	Acl	0.15
Anthracene	An	0.67
Benzo(a)anthracene	B(a)A	0.5
Benzo(a)pyrene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b/j)F	0.78
Benzo(g,h,i)perylene	B(ghi)P	6.6
Benzo(k)fluoranthene	B(k)F	0.78
Chrysene	C	7
Dibenz(a,h)anthracene	DA	0.1
Fluoranthene	FI	0.69
Fluorene	F	62
Indeno(1,2,3-cd)pyrene	I(123)P	0.38
1- & 2-Methylnaphthalene	T-MN	0.99
Naphthalene	N	0.6
Phenanthrene	P	6.2
Pyrene	Py	78
Total PCBs	PCB	0.35



LEGEND

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE:

SOIL ANALYTICAL RESULTS - PAH

project no. OTT-22009213-C0
scale 1:200
FIG 8

Filename: E:\OTT\OTT-22009213-C0\60 Execution\65 Drawings\Phase Two ESA\22009213-C0_Ph-II.dwg
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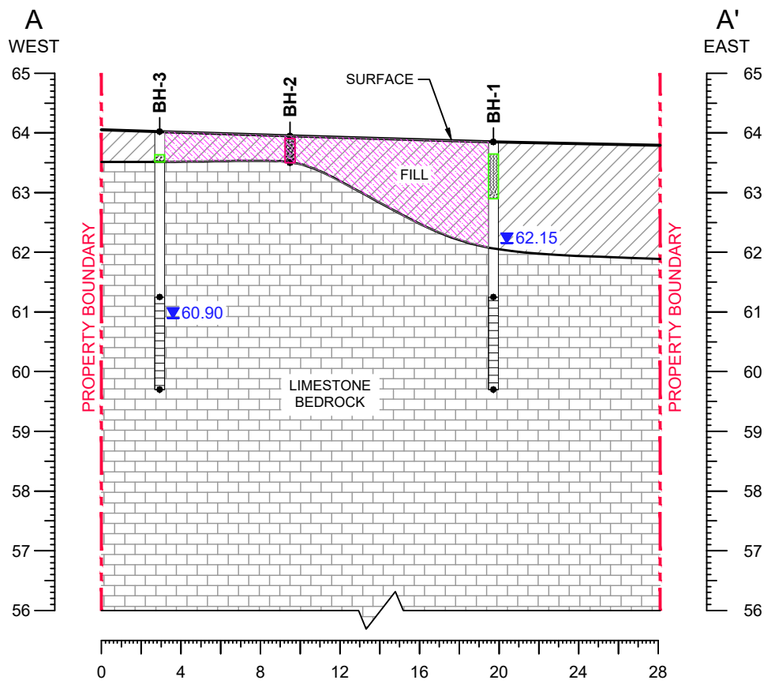
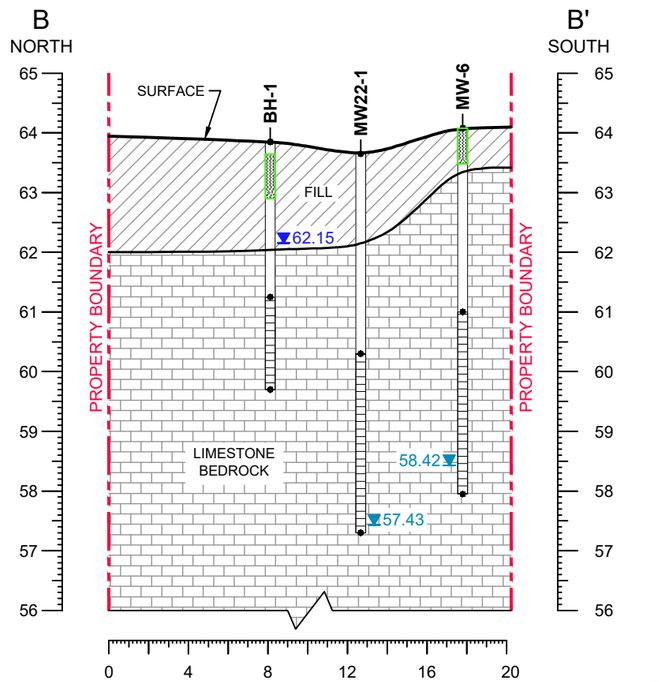
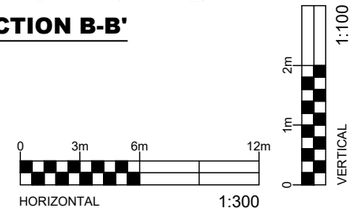


CROSS SECTION A-A'



CROSS SECTION B-B'



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 7 STANDARDS
Benzene	B	0.5
Toluene	T	320
Ethylbenzene	E	54
Total Xylenes	X	72
F1	F1 (C6-C10)	420
F2	F2 (C10-C16)	150
F3	F3 (C16-C34)	500
F4	F4 (C34-C50)	500
Chloroform	CF	2
1,1-Dichloroethane	1,1-DCA	11
1,2-Dichlororethane	1,2-DCA	0.5
1,1-Dichloroethylene	1,1-DCE	0.5
Cis-1,2-Dichloroethylene	c-1,2-DCE	1.6
Trans-1,2,-Dichlorothylene	t-1,2-DCE	1.6
Tetrachloroethylene	PCE	0.5
Trichloroethylene	TCE	0.5
Vinyl Chloride	VC	0.5

BH-1	Depth (mbgs)																		22-Jul-22
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
SS2	0.15 - 0.75	<0.02	<2	<0.05	<0.03	<10	<5	<10	<10	NA	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02

BH-2	Depth (mbgs)																		22-Jul-22
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
SS2	0.15 - 0.5	<0.02	<2	<0.05	<0.03	<10	<5	319	565	3220	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02

BH3	Depth (mbgs)																		22-Jul-22
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
GS3	0.35 - 0.45	<0.02	<2	<0.05	<0.03	<10	<5	52	69	310	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02
Dup1	0.35 - 0.45	<0.02	<2	<0.05	<0.03	<10	<5	47	60	NA	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02

MW-6	Depth (mbgs)																		30-Aug-19
		B	T	E	X	F1	F2	F3	F4	F4G	1,1-DCA	1,2-DCA	1,1-DCE	c-1,2-DCE	t-1,2-DCE	ST	PCE	TCE	VC
SS1	0.0 - 0.6	<0.02	<0.02	<0.02	<0.04	<10	20	160	580	1900	NA	NA	NA	NA	NA	NA	NA	NA	NA

LEGEND

- PROPERTY(IES) BOUNDARIES
- GROUNDWATER LEVEL SEPTEMBER 19, 2019
- GROUNDWATER LEVEL (2022)
- SOIL QUALITY MEETS MECP TABLE 7 SCS
- SOIL QUALITY EXCEEDS MECP TABLE 7 SCS
- ESTIMATED AREA OF IMPACTED SOIL

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Ottawa, ON K2B 8H6, Canada

DATE: SEPTEMBER 2022
DESIGN: MM
CHECKED: CH
DRAWN BY: AS

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE: CROSS SECTION A-A' & B-B'
ANALYTICAL RESULTS - PHC AND VOC

project no. OTT-22009213-C0
scale HORZ. 1:300 / VERT. 1:100
FIG 9

Filename: E:\OTT\OTT-22009213-C0\60 Execution\65 Drawings\Phase Two ESA\22009213-C0_Ph-II.dwg
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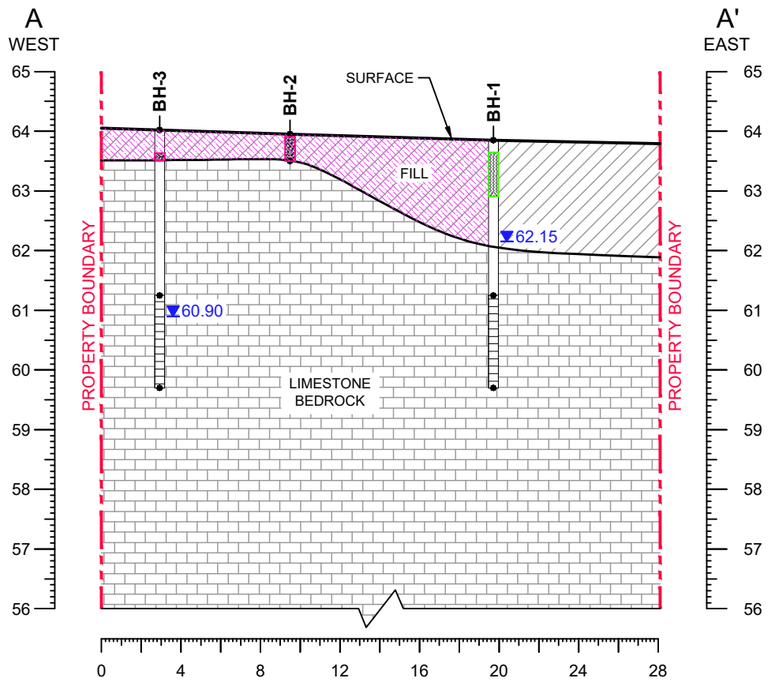
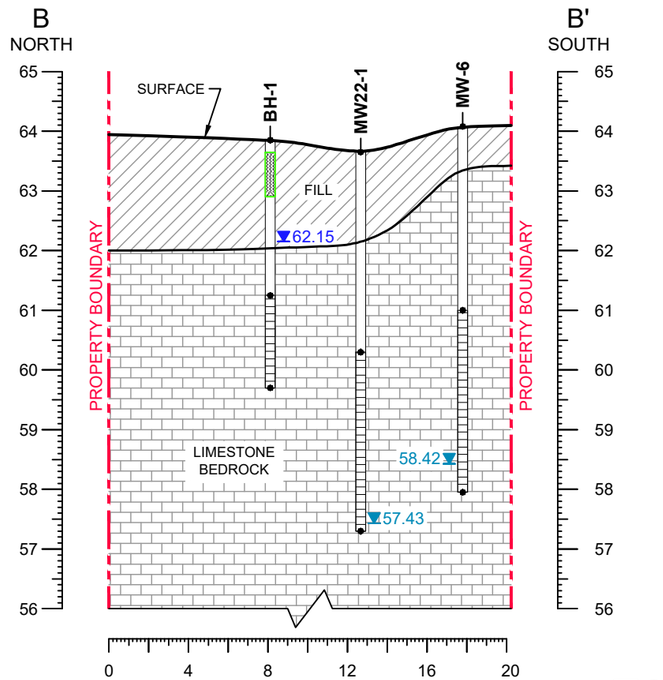
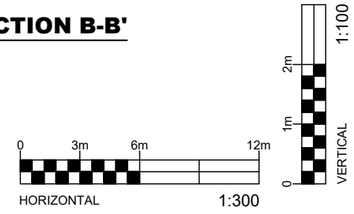


CROSS SECTION A-A'



CROSS SECTION B-B'



PARAMETERS	ABBREVIATION	REG
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Chromium VI	Cr VI	8
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Mercury	Hg	0.27
Molybdenum	Mo	6.9
Nickel	Ni	100
Selenium	Se	2.4
Silver	Ag	20

BH-1	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	22-Jul-22
Run1	0.15 - 0.75	< 0.5	1.2	259	0.5	6.2	0.14	< 0.5	43	< 0.2	16	12	11	0.042	2	24	0.6	0.7	0.2	0.6	36	119	1.15

BH-2	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	22-Jul-22
SS2	0.15 - 0.5	2.9	7.7	343	0.6	9.9	0.13	2.4	35	< 0.2	13	55	277	0.278	2	30	1.1	0.4	0.3	0.8	55	343	0.711

BH3	Depth (mbgs)	Sb	As	Ba	Be	B	B (HWS)	Cd	Cr	Cr VI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	U	V	Zn	22-Jul-22
GS3	0.35 - 0.45	1.6	9.4	267	0.6	9.5	0.16	3	27	< 0.2	10	93	236	0.687	2	24	0.9	0.5	0.2	0.6	42	393	0.222
Dup1	0.35 - 0.45	1.8	9.8	283	0.7	7.9	0.13	2.7	30	< 0.2	10	82	229	0.557	2	25	1.1	0.5	0.2	0.7	47	395	0.233

LEGEND

- PROPERTY(IES) BOUNDARIES
- GROUNDWATER LEVEL SEPTEMBER 19, 2019
- GROUNDWATER LEVEL (2022)
- SOIL QUALITY MEETS MECP TABLE 7 SCS
- SOIL QUALITY EXCEEDS MECP TABLE 7 SCS
- ESTIMATED AREA OF IMPACTED SOIL

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Ottawa, ON K2B 8H6, Canada

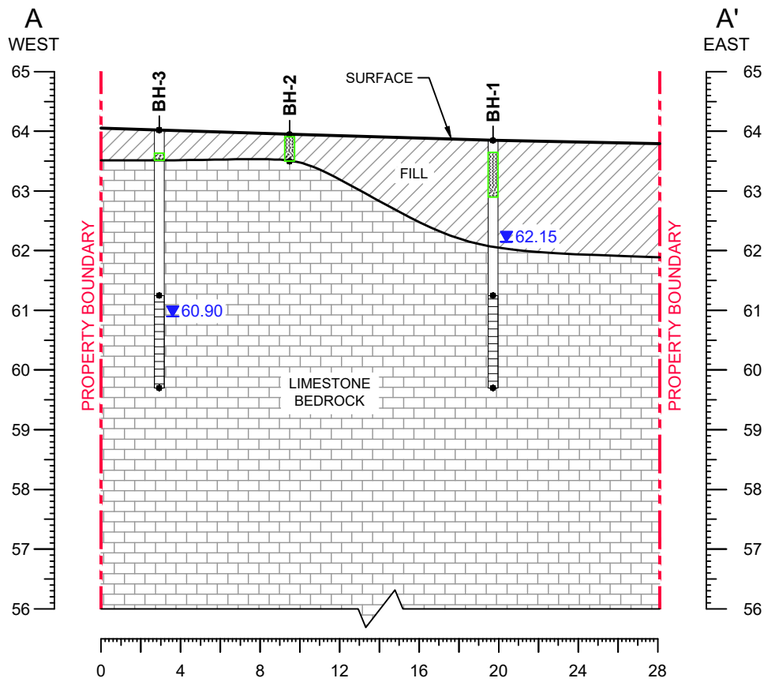
DATE: SEPTEMBER 2022
DESIGN: MM
CHECKED: CH
DRAWN BY: AS

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

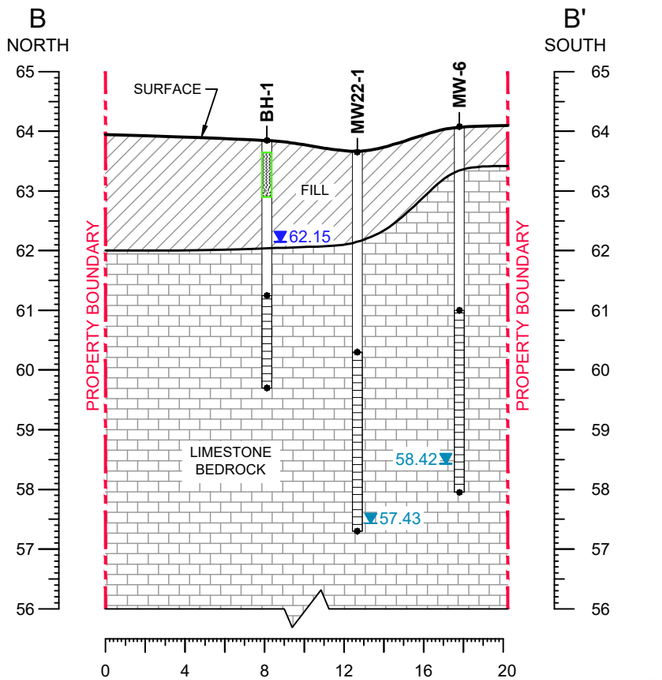
266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE: CROSS SECTION A-A' & B-B'
ANALYTICAL RESULTS - METALS

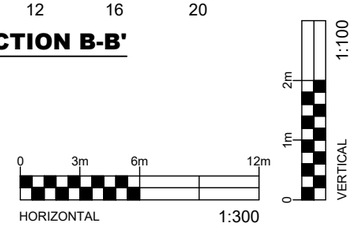
project no. OTT-22009213-C0
scale HORZ. 1:300 / VERT. 1:100
FIG 10



CROSS SECTION A-A'



CROSS SECTION B-B'



PARAMETERS	ABBREVIATION	REG 153/04 TABLE 7
Acenaphthene	Ace	7.9
Acenaphthylene	Acl	0.15
Anthracene	An	0.67
Benzo(a)anthracene	B(a)A	0.5
Benzo(a)pyrene	B(a)P	0.3
Benzo(b/j)fluoranthene	B(b/j)F	0.78
Benzo(g,h,i)perylene	B(ghi)P	6.6
Benzo(k)fluoranthene	B(k)F	0.78
Chrysene	C	7
Dibenz(a,h)anthracene	DA	0.1
Fluoranthene	Fl	0.69
Fluorene	F	62
Indeno(1,2,3-cd)pyrene	I(123)P	0.38
1-Methylnaphthalene	T-MN	0.99
Naphthalene	N	0.6
Phenanthrene	P	6.2
Pyrene	Py	78
Total PCBs	PCB	0.35

BH-1	Depth (mbgs)	22-Jul-22																
		Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	T-MN	N	P	Py
Run1	0.15 - 0.75	< 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	< 0.05

BH-2	Depth (mbgs)	22-Jul-22																
		Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	T-MN	N	P	Py
SS2	0.15 - 0.5	< 0.05	< 0.07	0.08	0.26	0.23	0.3	0.11	0.11	0.3	0.05	0.43	< 0.09	0.12	< 0.05	< 0.07	0.32	0.38

BH3	Depth (mbgs)	22-Jul-22																
		Ace	Acl	An	B(a)A	B(a)P	B(b/j)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	T-MN	N	P	Py
GS3	0.35 - 0.45	< 0.05	< 0.05	< 0.05	0.17	0.15	0.22	0.07	0.09	0.18	< 0.05	0.28	< 0.05	0.09	< 0.05	< 0.05	0.13	0.21
Dup1	0.35 - 0.45	< 0.05	< 0.05	< 0.05	0.12	0.13	0.18	0.06	0.06	0.15	< 0.05	0.21	< 0.05	0.07	< 0.05	< 0.05	0.12	0.18

LEGEND

- PROPERTY(IES) BOUNDARIES
- GROUNDWATER LEVEL SEPTEMBER 19, 2019
- GROUNDWATER LEVEL (2022)
- SOIL QUALITY MEETS MECP TABLE 7 SCS
- SOIL QUALITY EXCEEDS MECP TABLE 7 SCS

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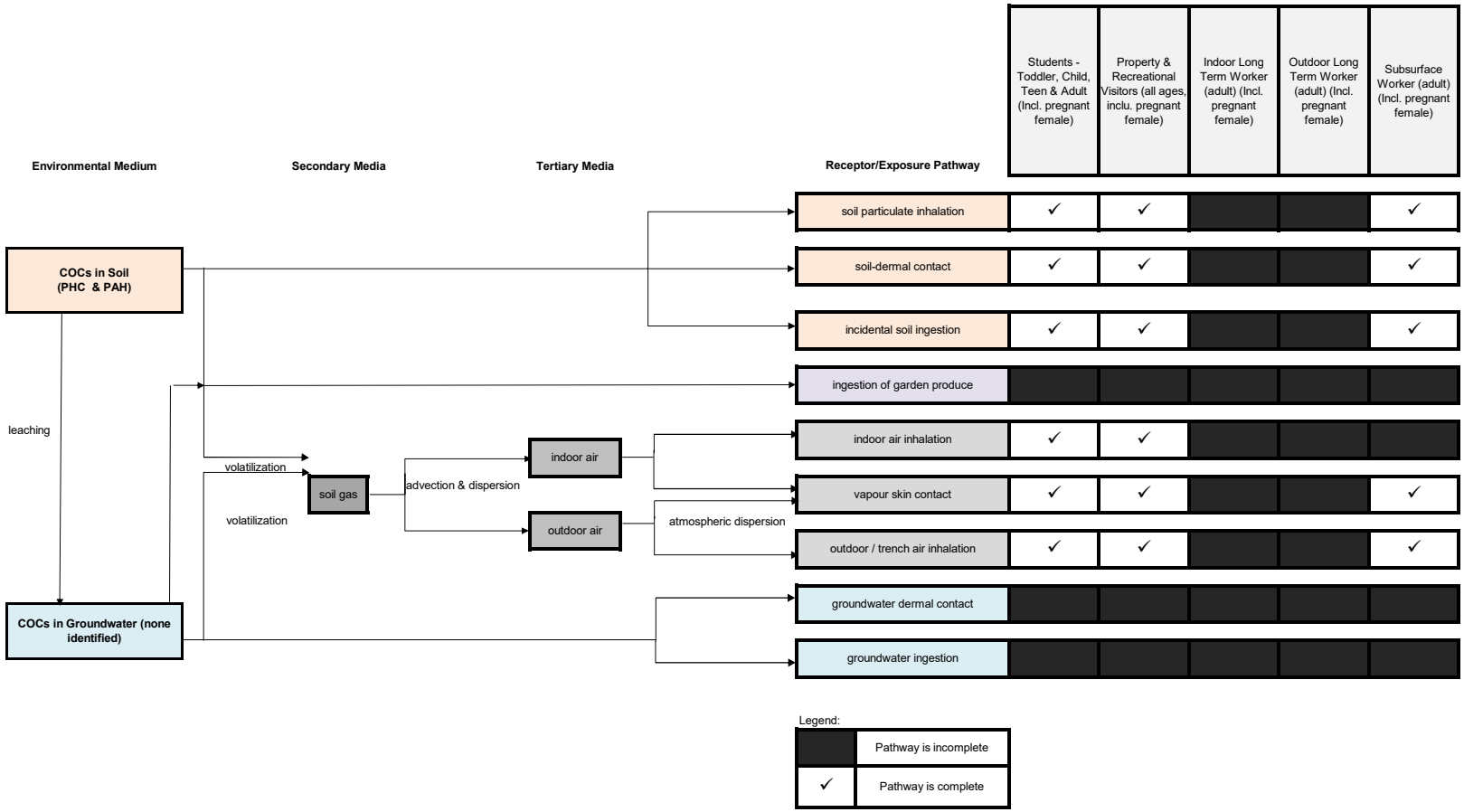
DATE: SEPTEMBER 2022
DESIGN: MM
CHECKED: CH
DRAWN BY: AS

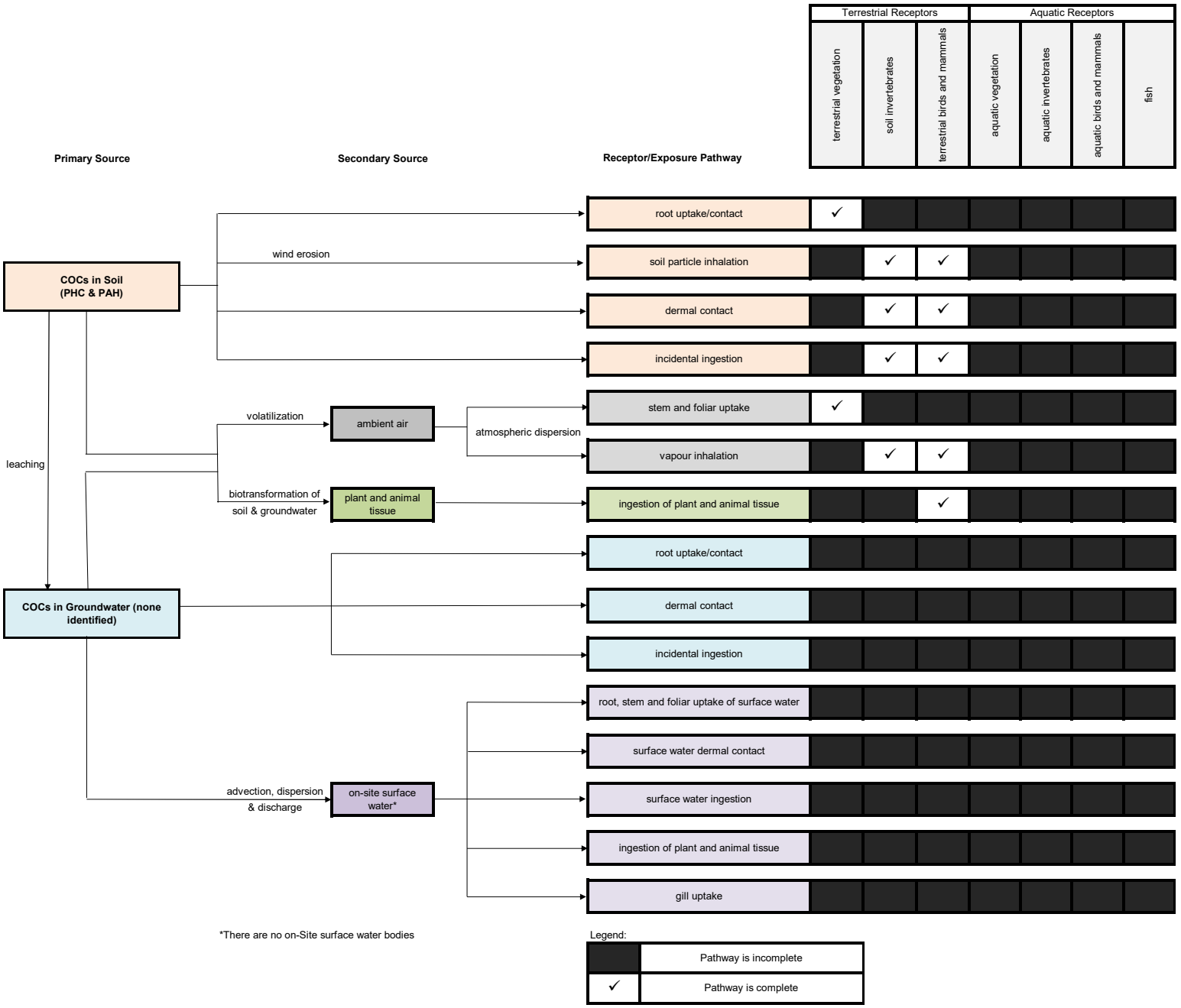
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (ESA)

266 AND 268 CARRUTHERS AVENUE, OTTAWA, ONTARIO

TITLE: CROSS SECTION A-A' & B-B'
ANALYTICAL RESULTS - PAH

project no. OTT-22009213-C0
scale HORZ. 1:300 / VERT. 1:100
FIG 11

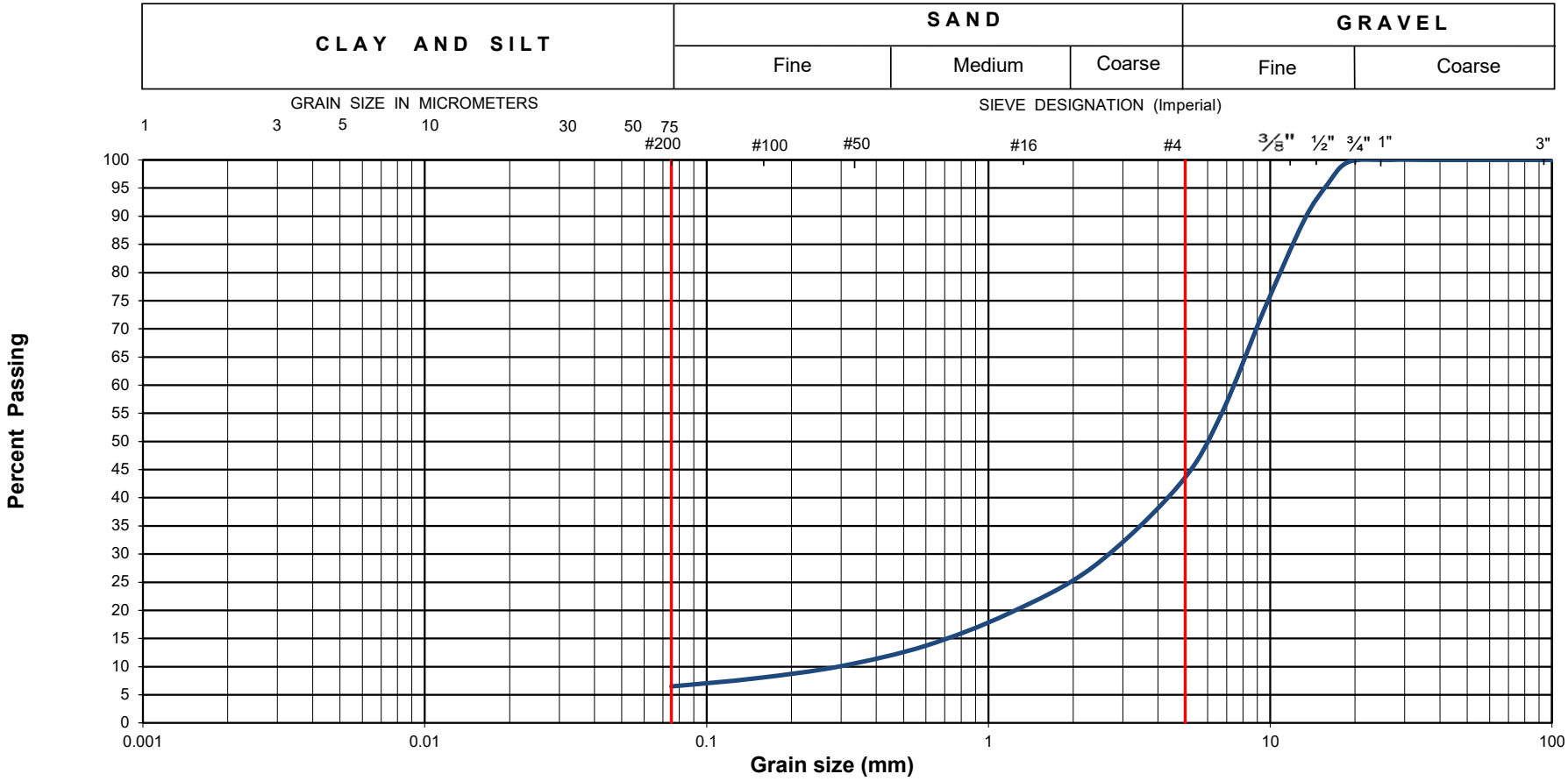

Environmental Medium
Secondary Media
Tertiary Media
Receptor/Exposure Pathway
Students - Toddler, Child, Teen & Adult (Incl. pregnant female)
Property & Recreational Visitors (all ages, inclu. pregnant female)
Indoor Long Term Worker (adult) (Incl. pregnant female)
Outdoor Long Term Worker (adult) (Incl. pregnant female)
Subsurface Worker (adult) (Incl. pregnant female)
COCs in Soil (PHC & PAH)
COCs in Groundwater (none identified)
leaching
volatilization
volatilization
soil gas
advection & dispersion
indoor air
outdoor air
atmospheric dispersion
soil particulate inhalation
soil-dermal contact
incidental soil ingestion
ingestion of garden produce
indoor air inhalation
vapour skin contact
outdoor / trench air inhalation
groundwater dermal contact
groundwater ingestion
Legend:
Pathway is incomplete
Pathway is complete


Terrestrial Receptors
Aquatic Receptors
terrestrial vegetation
soil invertebrates
terrestrial birds and mammals
aquatic vegetation
aquatic invertebrates
aquatic birds and mammals
fish
Primary Source
Secondary Source
Receptor/Exposure Pathway
COCs in Soil (PHC & PAH)
COCs in Groundwater (none identified)
wind erosion
volatilization
ambient air
atmospheric dispersion
leaching
biotransformation of soil & groundwater
plant and animal tissue
advection, dispersion & discharge
on-site surface water*
root uptake/contact
soil particle inhalation
dermal contact
incidental ingestion
stem and foliar uptake
vapour inhalation
ingestion of plant and animal tissue
root uptake/contact
dermal contact
incidental ingestion
root, stem and foliar uptake of surface water
surface water dermal contact
surface water ingestion
ingestion of plant and animal tissue
gill uptake
*There are no on-Site surface water bodies
Legend:
Pathway is incomplete
Pathway is complete

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

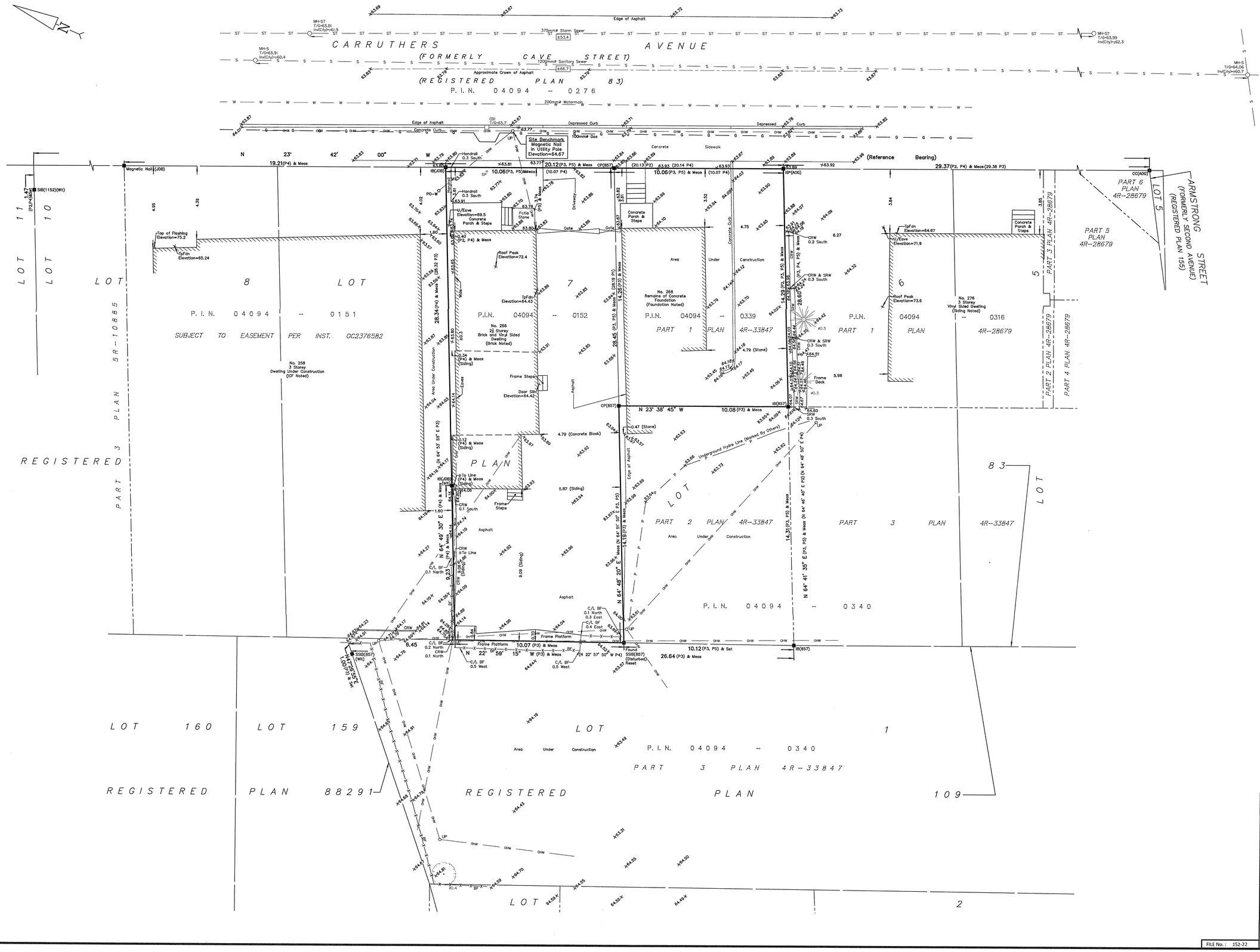
Unified Soil Classification System



EXP Project No.:	**OTT-22014692-A0**	**Project Name :**	**Geotechnical Investigation - Proposed Building**						
Client :	**The Berge Homes**	**Project Location :**	**266-268 Carruthers Ave, Ottawa**						
Date Sampled :	**July 26, 2022**	**Borehole No:**	**BH1**		**Sample:**	**GS1**		**Depth (m) :**	**0.025-0.150**
Sample Composition :		**Gravel (%)**	**58**	**Sand (%)**	**35**	**Silt & Clay (%)**	**7**	**Figure :**	**xxx**
Sample Description :	**Poorly Graded Gravel with Silt and Sand (GP - GM)**								

Appendix B: Survey Plan

365278, 5029544



TOPOGRAPHIC PLAN OF SURVEY OF

PART OF LOTS 6 & 7 REGISTERED PLAN 83 CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2022

Scale 1: 100

0 2.5 5 7.5 10 metres

Metric Note

Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99994.

Bearing Note

Bearings are grid, referred to the westerly limit of Carruthers Avenue having a bearing of N 23° 42' 00" W as shown on Plan 4R-28679 and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

For bearing comparisons, a rotation of 0°53'25" counter-clockwise was applied to bearings on P3 & P5.

Elevation Notes

1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978. (Monument No. 197534238)
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

Utility Notes

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: E-08-09 & E-08-13.
4. Sanitary and storm sewer grades and inverts were compiled from: City of Ottawa Public Utilities Registry.
5. *A field location of underground plant by the pertinent utility authority is* mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

Denotes

○—□	"	Survey Monument Planted
■	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
IB*	"	Iron Bar (0.3m Long)
CC	"	Cut Cross
CP	"	Concrete Pin
(Wit)	"	Witness
Meas	"	Measured
(P1)	"	Registered Plan 83
(P2)	"	Plan 4R-28679
(P3)	"	Plan 4R-33847
(P4)	"	Plan by (JDB) dated October 20, 2015 (Ref. No. 15-10-861-00)
(P5)	"	Plan by (857) dated October 7, 2020 (Ref. No. 18(a)-83)
○ MH-ST	"	Maintenance Hole (Storm)
○ MH-S	"	Maintenance Hole (Sanitary)
—— ST ——	"	Underground Storm Sewer
—— S ——	"	Underground Sanitary Sewer
—— W ——	"	Underground Water
—— P ——	"	Underground Hydro
—— G ——	"	Underground Gas
—— OHW ——	"	Overhead Wires
○ UP	"	Utility Pole
□ CBI	"	Catch Basin Inlet
○ SP	"	Water Stand Post
○ PO—W	"	Wood Pole
Ø	"	Diameter
CLF	"	Chain Link Fence
BF	"	Board Fence
CRW	"	Concrete Retaining Wall
SRW	"	Stone Retaining Wall
Inv.	"	Invert
Inv(City)	"	Invert from City of Ottawa Public Utilities Registry
T/G	"	Top of Grate
U/Eave	"	Underside of Eave
TpFdn	"	Top of Foundation
C/L	"	Centreline
+65.00	"	Location of Elevations
+65.00	"	Top of Concrete Curb/Retaining Wall Elevation
	"	Property Line
	"	Deciduous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.
	"	Coniferous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.

Site Area = 429.8 sq.m.

Surveyor's Certificate

I certify that :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 18th day of April, 2022.

April 22/22
Date

Jamie Leslie
Ontario Land Surveyor

This plan of survey relates to AOLS Plan Submission Form Number V-25584.

FARLEY, SMITH & DENIS SURVEYING LTD.

ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS

Unit 275, 30 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
TEL. (613) 727-8226 E-mail: fsdsurveys@bellnet.ca

FILE No. : 152-22

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1UPU 2453b

Appendix C: Sampling and Analysis Plan

1 Introduction

This appendix presents the Sampling and Analysis Plan (SAAP) that was developed in support of the Phase Two Environmental Site Assessment (ESA) for the property located at 266 Carruthers Avenue in Ottawa, Ontario (hereinafter referred to as the 'site'). The SAAP presents the procedures and measures that will be undertaken during field investigative activities to characterize the site conditions and meet the data quality objectives of the Phase Two ESA.

The SAAP presents the sampling program proposed for the site, the recommended procedures and protocols for sampling and related field activities, the data quality objectives, and the quality assurance/ quality control measures that will be undertaken to provide for the collection of accurate, reproducible and representative data. These components are described in further detail below.

2 Field Sampling Program

The field sampling program was developed to provide for the collection of samples of the soil and groundwater for chemical analysis of petroleum hydrocarbons (PHC), benzene, toluene, ethylbenzene and xylenes (collectively known as 'BTEX'), polycyclic aromatic hydrocarbons (PAH), and metals. The soil sampling media is to consist of the overburden materials (depths up to 6.5 m of overburden beneath site). The soil sampling will be location-specific to assess for the potential presence of PHC, BTEX, PAH, and/or metals based on the identification of potential areas of potential environmental concern identified in a Phase One ESA completed by EXP in 2022. Vapour readings will also be taken in the field to determine samples to be submitted for laboratory analysis.

No groundwater sampling will be completed.

Vertical control of the boreholes will be obtained through the completion of an elevation survey with reference to a geodetic benchmark.

3 Field Methods

To meet the requirements of the field sampling program, the following field investigative methods will be undertaken:

- Borehole Drilling;
- Soil Sampling; and,
- Elevation Survey.

The field investigative methods will be performed following the procedures and protocols set out in EXP's standard operating procedures and are outlined below:

3.1 Borehole Drilling

Boreholes will be advanced at the site to facilitate the collection of soil samples for chemical analysis and geologic characterization; and, for the installation of groundwater monitoring wells. A total of 3 boreholes (BH22-1 to BH22-3) are proposed to be advanced at the site, up to a maximum overburden depth of approximately 2.5 m below grade, to provide for the collection of samples of the surficial and overburden materials beneath the site. The borehole locations will be selected to delineate the extent and magnitude of PCOC related impacts to the soil/fill.

Prior to borehole drilling, utility clearances will be obtained from public and private locators, as required. The borehole drilling program will be conducted by a licensed driller under the oversight of EXP field staff. All drilling equipment will be cleaned prior to the commencement of drilling at each borehole location.

3.2 Soil Sampling

Soil samples will be collected for chemical analysis and geologic property characterization. The soil samples will be collected using 5 cm diameter, 60 cm long, stainless steel split-spoon sampling devices advanced ahead of the direct push drilling equipment at continuous intervals. The split spoon sampling devices will be attached to drill rods and advanced into the soil by means of a standard penetrating hammer. Upon retrieval from the boreholes, the split-spoon samplers will be placed on a flat surface and disassembled by drilling personnel to provide access of the recovered cores. Geologic and sampling details of the recovered cores will be logged and the samples will be assessed for the potential presence of non-aqueous phase liquids. Samples for chemical analysis will be selected on the basis of visual and olfactory evidence of impacts and at specific intervals to define the lateral and vertical extent of known impacts.

Recommended volumes of soil samples selected for chemical analysis will be collected into pre-cleaned, laboratory supplied, analytical test group specific containers. The samples will be placed into clean insulated coolers chilled with ice for storage and transport. Samples intended for analysis of BTEX and PHC F1-F2 will be collected into 40 ml vials. The samples will be assigned unique identification numbers, and the date, time, location, and requested analyses for each sample will be documented in a bound field note book. The samples will be submitted to the contract laboratory within analytical test group holding times under Chain of Custody (COC) protocols. New disposable chemical resistant gloves will be used for each soil core to prevent sample cross-contamination.

3.3 Elevation Survey

An elevation survey will be conducted to obtain vertical control of all borehole locations. The ground surface elevation of each borehole location will be surveyed against a known geodetic benchmark, or if unavailable, against a suitable arbitrary benchmark. Elevations measured against using a high precision GPS unit and a benchmark with an assigned elevation will be recorded as meters above mean sea level (m AMSL). The elevation survey will be accurate to within ± 0.5 cm.

4 Field Quality Assurance/Quality Control Program

The objective of the field quality assurance/quality control (QA/QC) program is to obtain soil samples and other field measurements that provide data of acceptable quality that meets the objectives of the Phase Two ESA. The objectives of the QA/QC program will be achieved through the implementation of procedures for the collection of unbiased (i.e. non-contaminated) samples, sample documentation and the collection of appropriate QC samples to provide a measure of sample reproducibility and accuracy. The field QA/QC measures will comprise:

- Decontamination Protocols;
- Equipment Calibration;
- Sample Preservation;
- Sample Documentation; and,
- Field Quality Control Samples.

Details on the field QA/QC measures are provided below.

4.1 Decontamination Protocols

Decontamination protocols will be followed during field sampling where non-dedicated sampling equipment is used to prevent sample cross contamination. The split spoon soil sampling device will be cleaned/decontaminated between sampling intervals in according with SOP requirements. All decontamination fluids will be collected and stored in sealed, labeled containers.

4.2 Equipment Calibration

All equipment requiring calibration will be calibrated in the field according to manufacturer's requirements using analytical grade reagents, or by the supplier prior to conducting field activities, and subsequently checked in the field. The calibration of all pre-calibrated instruments will be checked in the field using analytical grade reagents and re-calibrated as required. For multiple day sampling events, equipment calibration will be checked prior to the beginning of sampling activities. All calibration data will be documented in a bound hard cover notebook.

4.3 Sample Preservation

All samples will be preserved using appropriate analytical test group specific reagents, as required, and upon collection placed in pre-chilled insulated coolers packed with ice for storage and transport.

4.4 Sample Documentation

All samples will be assigned a unique identification number, which is to be recorded along with the date, time, project number, company name, location and requested analysis in a bound field notebook. All samples will be handled and transported following COC protocols.

4.5 Field Quality Control

Field quality controls samples will be collected to evaluate the accuracy and reproducibility of the field sampling procedures. For soil sampling, one (1) field duplicate is to be collected for every ten (10) samples submitted for chemical analysis. The field duplicate samples will be assessed by calculating the relative percent difference and comparing to the analytical test group specific acceptance criteria.

Appendix D: Borehole Logs

Log of Borehole BH-1

Project No: OTT-22014692-A0

Project: Geotechnical Investigation - Proposed Residential Development

Location: 266 Carruthers Avenue, City of Ottawa, Ontario

Figure No. 3

Page. 1 of 1

Date Drilled: 'July 26, 2022

Drill Type: CME-55 Truck Mount Drill Rig

Datum: Estimated Elevation

Logged by: M.Z Checked by: I.T

Split Spoon Sample ⊠ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○⊣ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Estimated Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~25 mm thick	63.85	0				
		GRANULAR FILL ~ 125 mm Crushed limestone, gravel with sand and silt, grey, moist (compact)	63.8					
		FILL Sand and gravel to clayey silt, some topsoil inclusions or seams, cobbles, boulders, dark brown, moist, (compact to loose)	63.7		18		GS1	
							SS2	18.7
				1	2		SS3	
			62.3		1, then bouncing refusal		SS4	19.5
		LIMESTONE BEDROCK Grey (excellent Quality)	62.15	2			Run 1	25.8
				3			Run 2	25.8
				4				
		Borehole Terminated at 4.2 m Depth	59.7					

LOG OF BOREHOLE BH LOGS 266 CARRUTHERS 22014692.GPJ TROW OTTAWA.GDT 8/31/22

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe was installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22014692-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	Core Water	no cave
July 29, 2022	3.1	
August 30, 2022	1.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	1.7 - 2.8	92	87
2	2.8 - 4.2	100	100

Log of Borehole BH-2

Project No: OTT-22014692-A0

Project: Geotechnical Investigation - Proposed Residential Development

Location: 266 Carruthers Avenue, City of Ottawa, Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: 'July 26, 2022

Drill Type: CME-55 Truck Mount Drill Rig

Datum: Estimated Elevation

Logged by: M.Z Checked by: I.T

Split Spoon Sample ⊠
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Estimated Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~25 mm thick	63.95	0	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60	GS1	
		GRANULAR FILL ~ 125 mm Crushed limestone, grey, moist (compact)	63.9					
		FILL Sand and gravel with topsoil, dark brown, moist (compact)	63.8		**7, then bouncing refusal**		SS2	
		Auger Refusal at 0.5 m Depth	63.5					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22014692-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	no cave

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BH LOGS 266 CARRUTHERS 22014692.GPJ TROW OTTAWA.GDT 8/31/22

Log of Borehole BH-3

Project No: OTT-22014692-A0

Project: Geotechnical Investigation - Proposed Residential Development

Location: 266 Carruthers Avenue, City of Ottawa, Ontario

Figure No. 5

Page. 1 of 1

Date Drilled: 'July 26, 2022

Drill Type: CME-55 Truck Mount Drill Rig

Datum: Estimated Elevation

Logged by: M.Z Checked by: I.T

Split Spoon Sample ⊠ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Estimated Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~25 mm thick	64.02	0			GS1	
		GRANULAR FILL ~ 125 mm Crushed limestone, grey, moist (compact)	64.0				SS2	
			63.9		2, then bouncing refusal		GS3	
		FILL Sand and gravel with topsoil, cobbles, dark brown, moist (loose)	63.6					
		LIMESTONE BEDROCK Grey (fair to good quality)		1				Run 1 25.9
				2				Run 2 25.8
			60.92	3				Run 3 26.0
				4				
			59.7					
		Borehole Terminated at 4.3 m Depth						

LOG OF BOREHOLE BH LOGS 266 CARRUTHERS 22014692.GPJ TROW OTTAWA.GDT 8/31/22

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe was installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22014692-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	Core water	no cave
July 29, 2022	3.4	
August 30, 2022	3.1	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	0.4 - 1.2	90	77
2	1.2 - 2.7	97	48
3	2.7 - 4.3	95	80

Log of Borehole MW22-1

Project No: OTT-22009213-B0

Project: Post Remediation Groundwater Sampling Program

Location: 177 Armstrong Street and 268 Carruthers Avenue, Ottawa, Ontario

Figure No. 1

Page. 1 of 1

Date Drilled: 'May 11, 2022

Drill Type: Geomachine Drill Rig

Datum: Geodetic Elevation

Logged by: P.O. Checked by: M.M.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		GRANULAR FILL ~ 100 mm Crushed gravel, grey	63.65	0
				1
			62.2	
		LIMESTONE BEDROCK Grey		2
				3
				4
				5
				6
			57.3 57.43	
		Borehole Terminated at 6.31 m Depth		

Standard Penetration Test N Value: 20 40 60 80
Shear Strength: 50 100 150 200 kPa

Combustible Vapour Reading (ppm): 250 500 750
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES

Natural Unit Wt. kN/m³

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 37 mm diameter monitoring well was installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-22009213-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
25 days	6.2	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	1.3 - 2.6	94	19
2	2.6 - 4.1	100	58

LOG OF BOREHOLE BOREHOLE LOGS 22009213.GPJ TROW OTTAWA.GDT 6/9/22

Log of Borehole BH 5

Project No: OTT-00252997-B0

Project: Phase Two Environmental Site Assessment

Location: 177 Armstrong Street and 268 Carruthers Avenue, Ottawa, Ontario

Figure No. 7

Page. 1 of 1

Date Drilled: 'August 30, 2019

Drill Type: CME-75 Truck Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.L. Checked by: I.T.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALTIC CONCRETE ~25 mm	64.01	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		GRANULAR FILL ~ 375 mm	63.9					
		Crushed gravel with sand, grey, damp	63.6		**50 for 50 mm**		SS1	
		Auger Refusal at 0.4 m Depth		1				
				2				
				3				
				4				
				5				

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00252997-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)
Completion	Dry	0.2

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE BOREHOLE LOGS 1 TO 8 OTT-00252997-B0.GPJ TROW OTTAWA.GDT 10/17/19

Log of Borehole MW 6

Project No: OTT-00252997-B0

Project: Phase Two Environmental Site Assessment

Location: 177 Armstrong Street and 268 Carruthers Avenue, Ottawa, Ontario

Figure No. 8

Page. 1 of 1

Date Drilled: 'August 30, 2019

Drill Type: CME-75 Truck Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.L. Checked by: I.T.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits —○— | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
			64.08	0
		ASPHALTIC CONCRETE ~35 mm	64.0	
		GRANULAR FILL ~ 350 mm Crushed gravel, grey, damp, (loose)	63.7	
		FILL Silty sand with gravel and cobbles, brown and grey, moist	63.4	
		LIMESTONE BEDROCK Aphanitic to fine grained, occasional fractures, grey, (very poor to excellent quality)		1
		Highly fractured with voids from 0.7 m to 2.5 m depths		2
		Void from 1.5 m to 2.1 m depths		
▼			58.43	4
			58.0	6
		Borehole Terminated at 6.1 m Depth		

Standard Penetration Test N Value: 20 40 60 80 — Shear Strength: 50 100 150 200 kPa

Combustible Vapour Reading (ppm): 250 500 750 — Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES	Natural Unit Wt. kN/m³
SS1	
Run 1	
Run 2	
Run 3	
Run 4	
Run 5	
Run 6	

LOG OF BOREHOLE BOREHOLE LOGS 1 TO 8 OTT-00252997-B0.GPJ TROW OTTAWA.GDT 10/17/19

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm diameter monitoring well with screened section installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00252997-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)
20 Days	5.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	0.7 - 1.4	39	0
2	1.4 - 2.2	22	0
3	2.2 - 2.5	100	0
4	2.5 - 3.3	100	92
5	3.3 - 4.9	100	95
6	4.9 - 6.1	100	100

Appendix E: Analytical Summary Tables

TABLE 1 SOIL ANALYTICAL RESULTS *(µg/g)*
PETROLEUM HYDROCARBONS
266 Carruthers Avenue, Ottawa

Parameter	MECP Table 7[1]	MW-6 SS1	BH1 SS2	BH2 SS2	BH3 GS3	Dup1
Sample Date (d/m/y)	Residential	30-Aug-19	22-Jul-22	22-Jul-22	22-Jul-22	Duplicate of
Sample Depth (mbsg)		0.0 - 0.6	0.15 - 0.75	0.15 - 0.5	0.35 - 0.45	BH3 GS3
BV Labs ID		KRR580	B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4
Date of Analysis		7-Sep-2019	29-Jul-2022	29-Jul-2022	29-Jul-2022	29-Jul-2022
Maxxam Certificate of Analysis		B9O6633	B22-23660	B22-23660	B22-23660	B22-23660
Acetone	16	NA	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Bromodichloromethane	13	NA	< 0.02	< 0.02	< 0.02	< 0.02
Bromoform	0.27	NA	< 0.02	< 0.02	< 0.02	< 0.02
Bromomethane	0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Chlorobenzene	2.4	NA	< 0.02	< 0.02	< 0.02	< 0.02
Chloroform	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	9.4	NA	< 0.02	< 0.02	< 0.02	< 0.02
1,2-Dichlorobenzene	3.4	NA	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	4.8	NA	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	0.083	NA	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	16	NA	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethane	3.5	NA	< 0.02	< 0.02	< 0.02	< 0.02
1,2-Dichloroethane	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
1,1-Dichloroethylene	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
Cis-1,2-Dichloroethylene	3.4	NA	< 0.02	< 0.02	< 0.02	< 0.02
Trans-1,2-Dichloroethylene	0.084	NA	< 0.02	< 0.02	< 0.02	< 0.02
1,2-Dichloropropane	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
Cis-1,3-Dichloropropylene Trans-1,3-Dichloropropylene	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	2	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05
Ethylene Dibromide	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
Hexane	2.8	NA	< 0.02	< 0.02	< 0.02	< 0.02
Methylene Chloride	0.1	NA	< 0.05	< 0.05	< 0.05	< 0.05
Methyl Ethyl Ketone	16	NA	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	1.7	NA	< 0.5	< 0.5	< 0.5	< 0.5
Methyl-t-Butyl Ether	0.75	NA	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	0.7	NA	< 0.05	< 0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	0.058	NA	< 0.02	< 0.02	< 0.02	< 0.02
1,1,2,2-Tetrachloroethane	0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	0.28	NA	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	2.3	< 0.02	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	0.38	NA	< 0.02	< 0.02	< 0.02	< 0.02
1,1,2-Trichloroethane	0.05	NA	< 0.02	< 0.02	< 0.02	< 0.02
Trichloroethylene	0.061	NA	< 0.05	< 0.05	< 0.05	< 0.05
Trichlorofluoromethane	4	NA	< 0.02	< 0.02	< 0.02	< 0.02
Vinyl Chloride	0.02	NA	< 0.02	< 0.02	< 0.02	< 0.02
Total Xylenes	3.1	<0.04	< 0.03	< 0.03	< 0.03	< 0.03
PHC F_1 (>C_6-C_{10})	55	<10	< 10	< 10	< 10	< 10
PHC F_2 (>C_{10}-C_{16})	98	20	< 5	< 5	< 5	< 5
PHC F_3 (>C_{16}-C_{34})	300	160	< 10	**319**	52	47
PHC F_4 (>C_{34}-C_{50})	2800	580	< 10	565	69	60
PHC F_4 gravimetric	2800	1900	NA	**3220**	310	NA

NOTES:

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 7 Non-Potable Residential SCS, coarse grained soil.

Shaded/Bold Concentration exceeds MECP Table 7 Residential SCS.

NA Not analyzed

TABLE 2 SOIL ANALYTICAL RESULTS *(µg/g)*
METALS
266 Carruthers Avenue, Ottawa

Parameter	MECP Table 7[1]	BH1 SS2	BH2 SS2	BH3 GS3	Dup1
Sample Date (d/m/y)	Residential	22-Jul-22	22-Jul-22	22-Jul-22	Duplicate of
Sample Depth (mbsg)		0.15 - 0.75	0.15 - 0.5	0.35 - 0.45	BH3 GS3
BV Labs ID		B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4
Date of Analysis		29-Jul-2022	29-Jul-2022	29-Jul-2022	29-Jul-2022
Maxxam Certificate of Analysis		B22-23660	B22-23660	B22-23660	B22-23660
Antimony	7.5	< 0.5	2.9	1.6	1.8
Arsenic	18	1.2	7.7	9.4	9.8
Barium	390	259	343	267	283
Beryllium	4	0.5	0.6	0.6	0.7
Boron	120	6.2	9.9	9.5	7.9
Boron (HWS)	1.5	0.14	0.13	0.16	0.13
Cadmium	1.2	< 0.5	**2.4**	**3**	**2.7**
Chromium	160	43	35	27	30
Chromium VI	8	< 0.2	< 0.2	< 0.2	< 0.2
Cobalt	22	16	13	10	10
Copper	140	12	55	93	82
Lead	120	11	**277**	**236**	**229**
Mercury	0.27	0.042	**0.278**	**0.687**	**0.557**
Molybdenum	6.9	2	2	2	2
Nickel	100	24	30	24	25
Selenium	2.4	0.6	1.1	0.9	1.1
Silver	20	0.7	0.4	0.5	0.5
Thallium	1	0.2	0.3	0.2	0.2
Uranium	23	0.6	0.8	0.6	0.7
Vanadium	86	36	55	42	47
Zinc	340	119	**343**	**393**	**395**
Sodium Absorption Ratio	5	1.15	0.711	0.222	0.233

NOTES:

1	MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 7 Non-Potable Residential SCS, coarse grained soil.
Shaded/ Bold	Concentration exceeds MECP Table 7 Residential SCS.
NA	Not analyzed

TABLE 3 SOIL ANALYTICAL RESULTS *(µg/g)*
POLYCYCLIC AROMATIC HYDROCARBONS
266 Carruthers Avenue, Ottawa

Parameter	MECP Table 7[1]	BH1 SS2	BH2 SS2	BH3 GS3	Dup1
Sample Date (d/m/y)	Residential	22-Jul-22	22-Jul-22	22-Jul-22	Duplicate of
Sample Depth (mbsg)		0.15 - 0.75	0.15 - 0.5	0.35 - 0.45	BH3 GS3
Lab ID		B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4
Date of Analysis		29-Jul-2022	29-Jul-2022	29-Jul-2022	29-Jul-2022
Certificate of Analysis		B22-23660	B22-23660	B22-23660	B22-23660
Acenaphthene	7.9	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.15	< 0.05	< 0.07	< 0.05	< 0.05
Anthracene	0.67	< 0.05	0.08	< 0.05	< 0.05
Benzo[a]anthracene	0.5	< 0.05	0.26	0.17	0.12
Benzo[a]pyrene	0.3	< 0.05	0.23	0.15	0.13
Benzo[b]fluoranthene	0.78	< 0.05	0.3	0.22	0.18
Benzo[g,h,i]perylene	6.6	< 0.05	0.11	0.07	0.06
Benzo[k]fluoranthene	0.78	< 0.05	0.11	0.09	0.06
Chrysene	7	< 0.05	0.3	0.18	0.15
Dibenz[a,h]anthracene	0.1	< 0.05	0.05	< 0.05	< 0.05
Fluoranthene	0.69	< 0.05	0.43	0.28	0.21
Fluorene	62	< 0.05	< 0.09	< 0.05	< 0.05
Indeno[1,2,3-cd]pyrene	0.38	< 0.05	0.12	0.09	0.07
Methylnaphthalene, 2-(1-)	0.99	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	0.6	< 0.05	< 0.07	< 0.05	< 0.05
Phenanthrene	6.2	< 0.05	0.32	0.13	0.12
Pyrene	78	< 0.05	0.38	0.21	0.18

NOTES:

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 7 Non-Potable Residential SCS, coarse grained soil.

Shaded/ Bold Concentration exceeds MECP Table 7 Residential SCS.

Table 4 - Maximum Concentrations in Soil
266 Carruthers Avenue, Ottawa
OTT-22009213-C0

Parameter	Sample Location	Sample Depth (mbgs)	Sampling Date	Maximum Concentration	MECP Table 7
Petroleum Hydrocarbons					
F1 PHC (C6 - C10) - BTEX	All locations	0.0 - 0.6	22-Jul-22	<10	55
F2 PHC (C10-C16)	MW-6 SS1	0.0 - 0.6	30-Aug-19	20	98
F3 PHC (C16-C34)	BH2 SS2	0.15 - 0.5	22-Jul-22	319	300
F4 PHC (C34-C50)	BH2 SS2	0.15 - 0.5	22-Jul-22	3220	2800
Benzene	All locations	0.0 - 0.6	22-Jul-22	<0.02	0.21
Ethylbenzene	All locations	0.0 - 0.6	3-Sep-19	<0.05	2
Toluene	All locations	0.0 - 0.6	30-Aug-19	<0.2	2.3
Xylenes, total	MW-6 SS1	0.0 - 0.6	30-Aug-19	<0.04	3.1
Polycylic Aromatic Hydrocarbons					
Acenaphthene	BH2 SS2	0.15 - 0.5	22-Jul-22	< 0.05	7.9
Acenaphthylene	BH2 SS2	0.15 - 0.5	22-Jul-22	< 0.07	0.15
Anthracene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.08	0.67
Benzo(a)anthracene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.26	0.5
Benzo(a)pyrene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.23	0.3
Benzo(b/j)fluoranthene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.30	0.78
Benzo(g,h,i)perylene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.11	6.6
Benzo(k)fluoranthene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.11	0.78
Chrysene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.30	7
Dibenz(a,h)anthracene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.05	0.1
Fluoranthene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.43	0.69
Fluorene	BH2 SS2	0.15 - 0.5	22-Jul-22	< 0.09	62
Indeno(1,2,3-cd)pyrene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.12	0.38
Methylnaphthalene, 2-(1-)	BH2 SS2	0.15 - 0.5	22-Jul-22	< 0.05	0.99
Naphthalene	BH2 SS2	0.15 - 0.5	22-Jul-22	< 0.07	0.6
Phenanthrene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.32	6.2
Pyrene	BH2 SS2	0.15 - 0.5	22-Jul-22	0.38	78
Inorganic Parameters					
Antimony	BH2 SS2	0.15 - 0.5	22-Jul-22	2.9	7.5
Arsenic	BH3 GS3	0.35 - 0.45	22-Jul-22	9.8	18
Barium	BH2 SS2	0.15 - 0.5	22-Jul-22	343	390
Beryllium	BH3 GS3	0.35 - 0.45	22-Jul-22	0.7	4
Boron	BH2 SS2	0.15 - 0.5	22-Jul-22	939	120
Boron (HWS)	BH3 GS3	0.35 - 0.45	22-Jul-22	0.16	2
Cadmium	BH2 SS2	0.15 - 0.5	22-Jul-22	2.7	1.2
Chromium	BH2 SS2	0.15 - 0.5	22-Jul-22	35	160
Chromium VI	BH2 SS2	0.15 - 0.5	22-Jul-22	<0.2	8
Cobalt	BH2 SS2	0.15 - 0.5	22-Jul-22	13	22
Copper	BH3 GS3	0.35 - 0.45	22-Jul-22	93	140
Lead	BH2 SS2	0.15 - 0.5	22-Jul-22	277	120
Mercury	BH3 GS3	0.35 - 0.45	22-Jul-22	0.687	0
Molybdenum	BH3 GS3	0.35 - 0.45	22-Jul-22	2	6.9
Nickel	BH2 SS2	0.15 - 0.5	22-Jul-22	30	100
Selenium	BH2 SS2	0.15 - 0.5	22-Jul-22	1.1	2.4
Silver	BH3 GS3	0.35 - 0.45	22-Jul-22	0.5	20
Thallium	BH2 SS2	0.15 - 0.5	22-Jul-22	0.3	1
Uranium	BH2 SS2	0.15 - 0.5	22-Jul-22	0.8	23
Vanadium	BH2 SS2	0.15 - 0.5	22-Jul-22	55	86
Zinc	BH3 GS3	0.35 - 0.45	22-Jul-22	395	340
Sodium Absorption Ratio	BH2 SS2	0.15 - 0.5	22-Jul-22	0.711	5

NOTES:

All results are in ppm on dry weight basis
Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.

Results were compared to Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 7 Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional property use and coarse textured soils.

266 Carruthers Avenue, Ottawa
OTT-22009213-C0

Parameter	Sample Location	Sample Depth (mbgs)	Sampling Date	Maximum Concentration	MECP Table 7
Volatile Organic Compounds					
Acetone	All locations	0.15 - 0.5	22-Jul-22	< 0.5	16
Benzene	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.21
Bromodichloromethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	13
Bromoform	All locations	0.15 - 0.5	22-Jul-22	< 0.02	5.4
Bromomethane	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.05
Carbon Tetrachloride	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.05
Chlorobenzene	All locations	0.15 - 0.5	22-Jul-22	< 0.02	2.4
Chloroform	All locations	0.15 - 0.5	22-Jul-22	< 0.02	3.1
Dibromochloromethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	9.4
1,2-Dichlorobenzene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	3.4
1,3-Dichlorobenzene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	4.8
1,4-Dichlorobenzene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.083
Dichlorodifluoromethane	All locations	0.15 - 0.5	22-Jul-22	< 0.05	16
1,1-Dichloroethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	3.5
1,2-Dichloroethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.05
1,1-Dichloroethylene	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.05
Cis-1,2-Dichloroethylene	All locations	0.15 - 0.5	22-Jul-22	< 0.02	3.4
Trans-1,2-Dichloroethylene	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.084
1,2-Dichloropropane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.05
Cis-1,3-Dichloropropylene	All locations	0.15 - 0.5	22-Jul-22	<0.020	0.05
Trans-1,3-Dichloropropylene	All locations	0.15 - 0.5	22-Jul-22		
Ethylbenzene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	2.1
Ethylene Dibromide	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.05
Hexane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	2.8
Methylene Chloride	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.1
Methyl Ethyl Ketone	All locations	0.15 - 0.5	22-Jul-22	< 0.5	16
Methyl Isobutyl Ketone	All locations	0.15 - 0.5	22-Jul-22	< 0.5	1.7
Methyl-t-Butyl Ether	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.75
Styrene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.7
1,1,1,2-Tetrachloroethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.058
1,1,2,2-Tetrachloroethane	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.05
Tetrachloroethylene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.28
Toluene	All locations	0.15 - 0.5	22-Jul-22	< 0.2	2.3
1,1,1-Trichloroethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.38
1,1,2-Trichloroethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.05
Trichloroethylene	All locations	0.15 - 0.5	22-Jul-22	< 0.05	0.05
Trichlorofluoromethane	All locations	0.15 - 0.5	22-Jul-22	< 0.02	4.0
Vinyl Chloride	All locations	0.15 - 0.5	22-Jul-22	< 0.02	0.02
Total Xylenes	All locations	0.15 - 0.5	22-Jul-22	< 0.03	3.1

NOTES:

All results are in ppm on dry weight basis
Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.

Results were compared to Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 7 Full Depth Generic Site Condition Standards (SCS) in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional property use and coarse textured soils.

TABLE 5 GROUNDWATER ANALYTICAL RESULTS *(µg/L)*
VOLATILE ORGANIC COMPOUNDS
177 Armstrong Street and 268 Carruthers Avenue, Ottawa

Parameter	MECP Table 7[1]	MW-6	TRIP BLANK
Sample Date (d/m/y)		19-Sep-19	19-Sep-19
Screened Interval		3.1 - 6.1	NA
BV Labs ID		KVG982	KVG987
Date of Analysis		25-Apr-2019	25-Apr-2019
Maxxam Certificate of Analysis		B9Q3808	B9Q3808
Acetone	100000	<10	<10
Benzene	0.5	<0.20	<0.20
Bromodichloromethane	67000	<0.50	<0.50
Bromoform	5	<1.0	<1.0
Bromomethane	0.89	<0.50	<0.50
Carbon Tetrachloride	0.2	<0.20	<0.20
Chlorobenzene	140	<0.20	<0.20
Chloroform	2	<0.20	<0.20
Dibromochloromethane	65000	<0.50	<0.50
1,2-Dichlorobenzene	150	<0.50	<0.50
1,3-Dichlorobenzene	7600	<0.50	<0.50
1,4-Dichlorobenzene	0.5	<0.50	<0.50
Dichlorodifluoromethane	3500	<1.0	<1.0
1,1-Dichloroethane	11	<0.20	<0.20
1,2-Dichloroethane	0.5	<0.50	<0.50
1,1-Dichloroethylene	0.5	<0.20	<0.20
Cis-1,2-Dichloroethylene	1.6	<0.50	<0.50
Trans-1,2-Dichloroethylene	1.6	<0.50	<0.50
1,2-Dichloropropane	0.58	<0.20	<0.20
Cis-1,3-Dichloropropylene	0.5	<0.50	<0.50
Trans-1,3-Dichloropropylene			
Ethylbenzene	54	<0.20	<0.20
Ethylene Dibromide	0.2	<0.20	<0.20
Hexane	5	<1.0	<1.0
Methylene Chloride	26	<2.0	<2.0
Methyl Ethyl Ketone	21000	<10	<10
Methyl Isobutyl Ketone	5200	<5.0	<5.0
Methyl-t-Butyl Ether	15	<0.50	<0.50
Styrene	43	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	<0.50	<0.50
1,1,2,2-Tetrachloroethane	0.5	<0.50	<0.50
Tetrachloroethylene	0.5	<0.20	<0.20
Toluene	320	<0.20	<0.20
1,1,1-Trichloroethane	23	<0.20	<0.20
1,1,2-Trichloroethane	0.5	<0.50	<0.50
Trichloroethylene	0.5	<0.20	<0.20
Trichlorofluoromethane	2000	<0.50	<0.50
Vinyl Chloride	0.5	<0.20	<0.20
Total Xylenes	72	<0.20	<0.20
PHC F1	420	<25	NA
PHC F2	150	<100	NA
PHC F3	500	<200	NA
PHC F4	500	<200	NA

NOTES:

1	MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 7 Non-Potable Residential SCS, coarse grained soil.*
Shaded	Concentration exceeds MECP Table 7 Residential SCS.
mbsg	Metres below surface grade

Table 6 - Maximum Concentrations in Groundwater
266 Carruthers Avenue, Ottawa
OTT-22009213-C0

Parameter	Sample Location	Screen Interval (mbgs)	Sampling Date	Maximum Concentration	MECP Table 7
Petroleum Hydrocarbons					
F1 PHC (C6 - C10) - BTEX	MW-6	3.1 - 6.1	19-Sep-19	<25	420
F2 PHC (C10-C16)	MW-6	3.1 - 6.1	19-Sep-19	<100	150
F3 PHC (C16-C34)	MW-6	3.1 - 6.1	19-Sep-19	<200	500
F4 PHC (C34-C50)	MW-6	3.1 - 6.1	19-Sep-19	<200	500
Volatile Organic Compounds					
Acetone	MW-6	3.1 - 6.1	19-Sep-19	<10	100000
Benzene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.5
Bromodichloromethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	67000
Bromoform	MW-6	3.1 - 6.1	19-Sep-19	<1.0	5
Bromomethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	0.89
Carbon Tetrachloride	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.2
Chlorobenzene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	140
Chloroform	MW-6	3.1 - 6.1	19-Sep-19	<0.20	2
Dibromochloromethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	65000
1,2-Dichlorobenzene	MW-6	3.1 - 6.1	19-Sep-19	<0.50	150
1,3-Dichlorobenzene	MW-6	3.1 - 6.1	19-Sep-19	<0.50	7600
1,4-Dichlorobenzene	MW-6	3.1 - 6.1	19-Sep-19	<0.50	0.5
Dichlorodifluoromethane	MW-6	3.1 - 6.1	19-Sep-19	<1.0	3500
1,1-Dichloroethane	MW-6	3.1 - 6.1	19-Sep-19	<0.20	11
1,2-Dichloroethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	0.5
1,1-Dichloroethylene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.5
Cis-1,2-Dichloroethylene	MW-6	3.1 - 6.1	19-Sep-19	<0.50	1.6
Trans-1,2-Dichloroethylene	MW-6	3.1 - 6.1	19-Sep-19	<0.50	1.6
1,2-Dichloropropane	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.58
Cis-1,3-Dichloropropylene	MW-6	3.1 - 6.1	19-Sep-19	< 0.5	0.5
Trans-1,3-Dichloropropylene	MW-6	3.1 - 6.1	19-Sep-19		
Ethylbenzene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	54
Ethylene Dibromide	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.2
Hexane	MW-6	3.1 - 6.1	19-Sep-19	<1.0	5
Methylene Chloride	MW-6	3.1 - 6.1	19-Sep-19	<2.0	26
Methyl Ethyl Ketone	MW-6	3.1 - 6.1	19-Sep-19	<10	21000
Methyl Isobutyl Ketone	MW-6	3.1 - 6.1	19-Sep-19	<5.0	5200
Methyl-t-Butyl Ether	MW-6	3.1 - 6.1	19-Sep-19	<0.50	15
Styrene	MW-6	3.1 - 6.1	19-Sep-19	<0.50	43
1,1,1,2-Tetrachloroethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	1.1
1,1,2,2-Tetrachloroethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	0.5
Tetrachloroethylene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.5
Toluene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	320
1,1,1-Trichloroethane	MW-6	3.1 - 6.1	19-Sep-19	<0.20	23
1,1,2-Trichloroethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	0.5
Trichloroethylene	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.5
Trichlorofluoromethane	MW-6	3.1 - 6.1	19-Sep-19	<0.50	2000
Vinyl Chloride	MW-6	3.1 - 6.1	19-Sep-19	<0.20	0.5
Total Xylenes	MW-6	3.1 - 6.1	19-Sep-19	<0.20	72

NOTES:

All results are in ppb

Non-detectable results are shown as "< (RDL)" where RDL represents the reporting detection limit.

Results were compared to Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 7 Full Depth Generic Site Condition Standards (SCS) in a Non- Potable Ground Water Condition for all types of property use and coarse textured soils.

TABLE 7 RELATIVE PERCENT DIFFERENCES
PETROLEUM HYDROCARBONS - SOIL
266 Carruthers Avenue, Ottawa

Parameter	Units	RDL	BH3 GS3	Dup1	RPD (%)	Alert Limit (%)
			22-Jul-22	22-Jul-22		
Petroleum Hydrocarbons						
PHC F_1 (>C_6-C10)	ug/g	10	< 10	< 10	nc	60
PHC F_2 (>C_{10}-C_{16})	ug/g	5	< 5	< 5	nc	60
PHC F_3 (>C_{16}-C_{34})	ug/g	10	52	47	10	60
PHC F_4 (>C_{34}-C_{50})	ug/g	10	3220	310	**165**	60
Volatiles						
Benzene	ug/g	0.020	<0.02	<0.02	nc	100
Ethylbenzene	ug/g	0.050	<0.05	<0.05	nc	100
Toluene	ug/g	0.200	<0.2	<0.2	nc	100
Total Xylenes	ug/g	0.030	<0.03	<0.03	nc	100

NOTES:

All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)
- means "not analysed"
nc means "not calculable" - one (or both) of the results are <5x RDL
Exceedances of alert limits are shown in **bold**
Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 8 RELATIVE PERCENT DIFFERENCES
METALS - SOIL
266 Carruthers Avenue, Ottawa

Parameter	Units	RDL	BH3 GS3	Dup1	RPD (%)	Alert Limit (%)
			22-Jul-22	22-Jul-22		
Inorganic Parameters						
Antimony	ug/g	0.20	1.6	1.8	12	60
Arsenic	ug/g	1.0	9.4	9.8	4	60
Barium	ug/g	0.50	267	283.0	6	60
Beryllium	ug/g	0.20	0.6	0.7	nc	60
Boron	ug/g	5.0	9.5	7.9	nc	60
Boron (HWS)	ug/g	1.0	0.2	0.1	21	60
Cadmium	ug/g	0.10	3.0	2.7	11	60
Chromium	ug/g	1.0	27.0	30.0	11	60
Chromium VI	ug/g	0.2	< 0.2	< 0.2	nc	60
Cobalt	ug/g	0.10	10.0	10.0	0	60
Copper	ug/g	0.50	93.0	82.0	13	60
Lead	ug/g	1.0	236.0	229.0	3	60
Mercury	ug/g	0.1	0.7	0.6	21	60
Molybdenum	ug/g	0.50	2.0	2.0	nc	60
Nickel	ug/g	0.50	24.0	25.0	4	60
Selenium	ug/g	0.50	0.9	1.1	nc	60
Silver	ug/g	0.20	0.5	0.5	nc	60
Thallium	ug/g	0.050	0.2	0.2	nc	60
Uranium	ug/g	0.050	0.6	0.7	15	60
Vanadium	ug/g	5.0	42.0	47.0	11	60
Zinc	ug/g	5.0	393.0	395.0	1	60

NOTES:

All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

TABLE 9 RELATIVE PERCENT DIFFERENCES
POLYCYCLIC AROMATIC HYDROCARBONS - SOIL
266 Carruthers Avenue, Ottawa

Parameter	Units	RDL	BH3 GS3	Dup1	RPD (%)	Alert Limit (%)
			22-Jul-22	22-Jul-22		
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	ug/g	0.05	< 0.05	< 0.05	nc	80
Acenaphthylene	ug/g	0.05	< 0.05	< 0.05	nc	80
Anthracene	ug/g	0.05	< 0.05	< 0.05	nc	80
Benzo(a)anthracene	ug/g	0.05	0.17	0.12	34	80
Benzo(a)pyrene	ug/g	0.05	0.15	0.13	14	80
Benzo(b/j)fluoranthene	ug/g	0.05	0.22	0.18	20	80
Benzo(ghi)perylene	ug/g	0.05	0.07	0.06	15	80
Benzo(k)fluoranthene	ug/g	0.05	0.09	0.06	40	80
Chrysene	ug/g	0.05	0.18	0.15	18	80
Dibenz(a,h)anthracene	ug/g	0.05	< 0.05	< 0.05	nc	80
Fluoranthene	ug/g	0.05	0.28	0.21	29	80
Fluorene	ug/g	0.05	< 0.05	< 0.05	nc	80
Indeno(1,2,3-cd)pyrene	ug/g	0.05	0.09	0.07	25	80
Methylnaphthalene, 2-(1-)	ug/g	0.05	< 0.05	< 0.05	nc	80
Naphthalene	ug/g	0.05	< 0.05	< 0.05	nc	80
Phenanthrene	ug/g	0.05	0.13	0.12	8	80
Pyrene	ug/g	0.05	0.21	0.18	15	80

NOTES:

All results on dry weight basis; <RDL means not detected at reporting detection limit (RDL)

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Alert Limit- since laboratory duplicate measures laboratory precision while field duplicates measures laboratory and field precision, the alert limits for field duplicates are two times the laboratory RPD .

Appendix F: Laboratory 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: **EXP SERVICES INC**
2650 QUEENSVIEW DRIVE, UNIT 100
OTTAWA, ON K2B8H6
(613) 688-1899

ATTENTION TO: **Matthew Zammit**

PROJECT: **OTT-22014692-AO**

AGAT WORK ORDER: **22Z926394**

SOIL ANALYSIS REVIEWED BY: **Jacky Zhu, Spectroscopy Technician**

DATE REPORTED: **Aug 05, 2022**

PAGES (INCLUDING COVER): **5**

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

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

Certificate of Analysis

AGAT WORK ORDER: 22Z926394

PROJECT: OTT-22014692-AO

CLIENT NAME: EXP SERVICES INC

ATTENTION TO: Matthew Zammit

SAMPLING SITE:

SAMPLED BY:

(Soil) Inorganics Chemistry

DATE RECEIVED: 2022-07-28

DATE REPORTED: 2022-08-04

				BH1 Run 2
		SAMPLE DESCRIPTION:		11'10"-12'3"
		SAMPLE TYPE:		Rock
		DATE SAMPLED:		2022-07-26
Parameter	Unit	G / S	RDL	4148500
Chloride (2:1)	µg/g		2	78
Sulphate (2:1)	µg/g		2	24
pH (2:1)	pH Units		NA	8.28
Resistivity (2:1) (Calculated)	ohm.cm		1	4370

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4148500 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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

Quality Assurance

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 22Z926394

PROJECT: OTT-22014692-AO

ATTENTION TO: Matthew Zammit

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date:			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
(Soil) Inorganics Chemistry															
Chloride (2:1)	4149226		3	3	NA	< 2	98%	70%	130%	102%	80%	120%	105%	70%	130%
Sulphate (2:1)	4149226		15	15	0.0%	< 2	101%	70%	130%	98%	80%	120%	104%	70%	130%
pH (2:1)	4140845		9.71	9.72	0.1%	NA	99%	80%	120%						

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.

Certified By:

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

Method Summary

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 22Z926394

PROJECT: OTT-22014692-AO

ATTENTION TO: Matthew Zammit

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

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 #: 22Z926394

Cooler Quantity: 1 small one bag - no ice / packs

Arrival Temperatures: 22.6 | 22.6 | 22.5
L.T → 8.3 | |

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: Bagged Ice

Report Information:

Company: EXP
Contact: Matthew Zammit
Address: 2650 Queensview drive Suite 100
Ottawa ON K2B 8H6
Phone: 613-688-1899 Fax:
Reports to be sent to:
1. Email: Matthew.Zammit@exp.com
2. Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04
Table ____ *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: OTT-22014692-A0
Site Location: 266 Carruthers St, Ottawa
Sampled By: EXP
AGAT ID #: 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, DOC (Y/N)	O. Reg 153: Metals & Inorganics	Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	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	Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	pH	Sulphate	Chlorides	Resistivity					Potentially Hazardous or High Concentration (Y/N)
BH 1 Run 2 11'10"-12'3"	July 26/22	AM PM	1														✓	✓	✓	✓					
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							
		AM PM																							

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Ryan DiGiuseppe [signature]	July 27/22	6:30 pm	C. Griffith [signature]	JUL 28 2022	08h00
[signature]	JUL 28 2022	16h00	Anthony Dasilva [signature]		

'22 JUL 29 8:55AM

Page ____ of ____

Nº: T114970

Document ID: DIV-78-1511.020

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

Date Issued: December 8, 2020

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-23660

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: 22009213-CO
P.O. NUMBER:
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
% Moisture	4	Richmond Hill	FAL	28-Jul-22	A-% moisture RH	
SVOC	4	Kingston	law	29-Jul-22	C-NAB-S-001 (k)	EPA 8270
PHC(F2-F4)	4	Kingston	KPR	28-Jul-22	C-PHC-S-001 (k)	CWS Tier 1
PHC(F2-F4)	2	Kingston	SmT	02-Aug-22	C-PHC-S-001 (k)	CWS Tier 1
VOC's	4	Richmond Hill	FAL	27-Jul-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	4	Richmond Hill	FAL	27-Jul-22	C-VPHS-01 (rh)	CWS Tier 1
Chromium (VI)	4	Holly Lane	ST	27-Jul-22	D-CRVI-02 (o)	EPA7196A
Mercury	4	Holly Lane	PBK	29-Jul-22	D-HG-01 (o)	EPA 7471A
Boron - HWS	4	Holly Lane	AHM	29-Jul-22	D-HWE s	MOE3470
Sodium Adsorption Ratio	4	Holly Lane	AHM	29-Jul-22	D-ICP-01 SAR (o)	SM 3120
Metals - ICP-OES	4	Holly Lane	AHM	29-Jul-22	D-ICP-02 (o)	EPA 6010
Metals - ICP-MS	4	Holly Lane	TPR	29-Jul-22	D-ICPMS-01 (o)	EPA 6020

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Tahir Yapici Ph.D
Lab Manager - Ottawa District

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-23660

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: 22009213-CO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		BH1, Run 1	BH2, SS-2	BH3, GS-3	Dup1	O. Reg. 153	
	Sample I.D.		B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4	Tbl. 1 - All	
	Date Collected		22-Jul-22	22-Jul-22	22-Jul-22	22-Jul-22		
Parameter	**Units**	**R.L.**						
Sodium Adsorption Ratio	units		1.15	0.711	0.222	0.233	2.4	
Antimony	µg/g	0.5	< 0.5	**2.9**	**1.6**	**1.8**	1.3	
Arsenic	µg/g	0.5	1.2	7.7	9.4	9.8	18	
Barium	µg/g	1	**259**	**343**	**267**	**283**	220	
Beryllium	µg/g	0.2	0.5	0.6	0.6	0.7	2.5	
Boron	µg/g	0.5	6.2	9.9	9.5	7.9	36	
Boron (HWS)	µg/g	0.02	0.14	0.13	0.16	0.13		
Cadmium	µg/g	0.5	< 0.5	**2.4**	**3.0**	**2.7**	1.2	
Chromium	µg/g	1	43	35	27	30	70	
Chromium (VI)	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.66	
Cobalt	µg/g	1	16	13	10	10	21	
Copper	µg/g	1	12	55	**93**	82	92	
Lead	µg/g	5	11	**277**	**236**	**229**	120	
Mercury	µg/g	0.005	0.042	**0.278**	**0.687**	**0.557**	0.27	
Molybdenum	µg/g	1	2	2	2	2	2	
Nickel	µg/g	1	24	30	24	25	82	
Selenium	µg/g	0.5	0.6	1.1	0.9	1.1	1.5	
Silver	µg/g	0.2	**0.7**	0.4	0.5	0.5	0.5	
Thallium	µg/g	0.1	0.2	0.3	0.2	0.2	1	
Uranium	µg/g	0.1	0.6	0.8	0.6	0.7	2.5	
Vanadium	µg/g	1	36	55	42	47	86	
Zinc	µg/g	3	119	**343**	**393**	**395**	290	
% moisture	%		24.6	11.5	19.7	22.1		
PHC F1 (C6-C10)	µg/g	10	< 10	< 10	< 10	< 10	25	
PHC F2 (>C10-C16)	µg/g	5	< 5	< 5	< 5	< 5	10	
PHC F3 (>C16-C34)	µg/g	10	< 10	**319**	52	47	240	
PHC F4 (>C34-C50)	µg/g	10	< 10	**565** [1]	69 [1]	60	120	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Tahir Yapici Ph.D
Lab Manager - Ottawa District

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Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: 22009213-CO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		BH1, Run 1	BH2, SS-2	BH3, GS-3	Dup1	O. Reg. 153	
	Sample I.D.		B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4	Tbl. 1 - All	
	Date Collected		22-Jul-22	22-Jul-22	22-Jul-22	22-Jul-22		
Parameter	**Units**	**R.L.**						
Acenaphthene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.072	
Acenaphthylene	µg/g	0.05	< 0.05	< 0.07	< 0.05	< 0.05	0.093	
Anthracene	µg/g	0.05	< 0.05	0.08	< 0.05	< 0.05	0.16	
Benzo(a)anthracene	µg/g	0.05	< 0.05	0.26	0.17	0.12	0.36	
Benzo(a)pyrene	µg/g	0.05	< 0.05	0.23	0.15	0.13	0.3	
Benzo(b)fluoranthene	µg/g	0.05	< 0.05	0.30	0.22	0.18	0.47	
Benzo(b+k)fluoranthene	µg/g	0.05	< 0.05	0.41	0.31	0.24		
Benzo(g,h,i)perylene	µg/g	0.05	< 0.05	0.11	0.07	0.06	0.68	
Benzo(k)fluoranthene	µg/g	0.05	< 0.05	0.11	0.09	0.06	0.48	
Chrysene	µg/g	0.05	< 0.05	0.30	0.18	0.15	2.8	
Dibenzo(a,h)anthracene	µg/g	0.05	< 0.05	0.05	< 0.05	< 0.05	0.1	
Fluoranthene	µg/g	0.05	< 0.05	0.43	0.28	0.21	0.56	
Fluorene	µg/g	0.05	< 0.05	< 0.09	< 0.05	< 0.05	0.12	
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	< 0.05	0.12	0.09	0.07	0.23	
Methylnaphthalene,1-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.59	
Methylnaphthalene,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.59	
Methylnaphthalene 2-(1-)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.59	
Naphthalene	µg/g	0.05	< 0.05	< 0.07	< 0.05	< 0.05	0.09	
Phenanthrene	µg/g	0.05	< 0.05	0.32	0.13	0.12	0.69	
Pyrene	µg/g	0.05	< 0.05	0.38	0.21	0.18	1	
Terphenyl-d14 (SS)	% rec.	10	92.0	77.0	84.0	78.0		
Acetone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Benzene	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Bromoform	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Bromomethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

Tahir Yapici Ph.D
Lab Manager - Ottawa District

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

C.O.C.: ---

REPORT No. B22-23660

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: 22009213-CO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		BH1, Run 1	BH2, SS-2	BH3, GS-3	Dup1	O. Reg. 153	
	Sample I.D.		B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4	Tbl. 1 - All	
	Date Collected		22-Jul-22	22-Jul-22	22-Jul-22	22-Jul-22		
Parameter	**Units**	**R.L.**						
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Chloroform	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichlorobenzene,1,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichlorobenzene,1,3-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichlorobenzene,1,4-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dichloroethane,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethylene,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloropropane,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02		
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02		
Dichloropropene 1,3-cis+trans	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Dibromoethane,1,2-(Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Hexane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

Tahir Yapici Ph.D
Lab Manager - Ottawa District

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Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-23660

Report To:

EXP Services Inc
2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada
Attention: Chris Kimmerly

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Soil

JOB/PROJECT NO.: 22009213-CO
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.		BH1, Run 1	BH2, SS-2	BH3, GS-3	Dup1	O. Reg. 153	
	Sample I.D.		B22-23660-1	B22-23660-2	B22-23660-3	B22-23660-4	Tbl. 1 - All	
	Date Collected		22-Jul-22	22-Jul-22	22-Jul-22	22-Jul-22		
Parameter	**Units**	**R.L.**						
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Styrene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Tetrachloroethane,1,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Tetrachloroethane,1,1,2,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Toluene	µg/g	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	
Trichloroethane,1,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Trichloroethane,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.25	
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03		
Xylene, o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03		
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.05	
Dibromofluoromethane (SS)	% rec.		85.4	84.2	83.2	85.1		
Toluene-d8 (SS)	% rec.		97.8	98.1	99.2	98.0		
Bromofluorobenzene,4(SS)	% rec.		101	103	98.1	101		
PHC F4 (Gravimetric)	µg/g	50		**3220** [2]	**310** [2]		120	

1 Note: Chromat did not return to baseline F4G requ

2 Note: Sample silica cleaned

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

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2378 Holly Lane
Ottawa Ontario K1V 7P1
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JOB/PROJECT NO.: 22009213-CO
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Summary of Exceedances

Table 1 - Res/Park/Institutional/Indus/Com/Commun		
BH1, Run 1	Found Value	Limit
Barium (µg/g)	259	220
Silver (µg/g)	0.7	0.5
BH2, SS-2	Found Value	Limit
Lead (µg/g)	277	120
Zinc (µg/g)	343	290
Barium (µg/g)	343	220
Antimony (µg/g)	2.9	1.3
Cadmium (µg/g)	2.4	1.2
PHC F4 (Gravimetric) (µg/g)	3220	120
PHC F4 (>C34-C50) (µg/g)	565	120
PHC F3 (>C16-C34) (µg/g)	319	240
Mercury (µg/g)	0.278	0.27
BH3, GS-3	Found Value	Limit
Barium (µg/g)	267	220
Cadmium (µg/g)	3.0	1.2
Copper (µg/g)	93	92
Mercury (µg/g)	0.687	0.27
Lead (µg/g)	236	120
PHC F4 (Gravimetric) (µg/g)	310	120
Antimony (µg/g)	1.6	1.3
Zinc (µg/g)	393	290
Dup1	Found Value	Limit

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - All - Table 1 - Res/Park/Institutional/Indus/Com/Commun

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Lab Manager - Ottawa District

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Table 1 - Res/Park/Institutional/Indus/Com/Commun

Dup1	Found Value	Limit
Zinc (µg/g)	395	290
Cadmium (µg/g)	2.7	1.2
Lead (µg/g)	229	120
Barium (µg/g)	283	220
Antimony (µg/g)	1.8	1.3
Mercury (µg/g)	0.557	0.27

O. Reg. 153 - Soil, Ground Water and Sediment Standards
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