



## Phase Two Environmental Site Assessment 1568 Meadowbrook Road, Ottawa, Ontario

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*November 17, 2021*

*Nemorin Group Limited  
Phase Two Environmental Site Assessment  
1568 Meadowbrook Road, Ottawa, Ontario  
OTT-21019403-A0  
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## Executive Summary

EXP Services Inc. (EXP) was retained by Nemorin Group Limited to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 1568 Meadowbrook Road, 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 Two 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 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 is located at 1568 Meadowbrook Road in Ottawa, Ontario. The Phase Two property is located within a residential area on the south side of Meadowbrook Road and has an area of approximately 0.14 hectares. The Phase One property has the property identification number (PIN) 043590054. The legal description of the Phase One property is PT LT 22, CON 20F, AS IN CT109302 ; S/T GL81584 GLOUCESTER.

Based on a review of historical aerial photographs, and other records review, it appears the subject site was first developed as a residential property circa 1976. Prior to the development of the building, the Site was used for agricultural purposes.

There are no water bodies on the subject site. The closest body of water is an unnamed water source tributary to Green's Creek approximately 330 m to the east. Topographically, the Phase Two property is relatively flat. Based on local topography, the groundwater flow at the Phase Two property is anticipated to be southeast towards Green's Creek.

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*, 1568 Meadowbrook Road, Ottawa, Ontario dated November 16, 2021. Based on the results of the Phase One ESA, EXP identified one area of potential environmental concern (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)
<b>APEC #1</b>	Entire Phase One property	PCA#30 – Imported Fill Material of Unknown Quality	On-Site	BTEX, PHC, metals, PAH	Soil

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

- Drilling three boreholes on the subject property;
- Submitting soil samples for laboratory analysis BTEX, PHC, 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 three (3) boreholes to investigate the quality of fill on the property which was identified in this Phase One and Two ESA. A worst case sample of the fill material was submitted for laboratory analysis of Petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene and xylenes (BTEX), metals, polycyclic aromatic hydrocarbons (PAH).
- The stratigraphy at the Phase Two property, as observed in the boreholes, consisted of a thin layer of topsoil overlying 0.7 m to 1.5 m of fill consisting of sand with some gravel. Underlying the fill material was interbedded sandy silt and silty clay to a maximum depth of 3.0 m. Underlying the silt and clay was grey glacial till consisting of silty sand with rock fragments. Shale bedrock was found between 3.4 and 3.6 m below ground surface (bgs).
- Based on the groundwater elevations measured in the three standpipes, the groundwater flow direction was calculated to be to the northwest.
- The concentrations of BTEX, PHCs, PAHs and metals in the analyzed soil samples were less than the 2011 MECP Table 3 SCS.
- Based on the results of the Phase Two ESA, no further environmental action is recommended at this time.

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 Nemorin Group Limited to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 1568 Meadowbrook Road, 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 areas of potential environmental concern (APEC) identified in a Phase Two ESA prepared by EXP.

The most recent use of the property is residential and the proposed future use is 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. Patricia Stelmack, M.Sc., P.Eng. reviewed the report.

### 1.1 Site Description

The Phase Two property is located at 1568 Meadowbrook Road in Ottawa, Ontario. The Phase Two property is located within a residential area on the south side of Meadowbrook Road and has an area of approximately 0.14 hectares. The Site consists of a one-storey residential dwelling with a full basement. A paved driveway and detached single-car garage are present on the east side of the property.

The Phase Two property has the property identification number (PIN) 043590054. The legal description of the Phase Two property is PT LT 22, CON 2OF, AS IN CT109302; S/T GL81584 GLOUCESTER.

A Site Location Plan is provided as Figure 1 and a Phase Two study area and PCAs is provided as Figure 2 in Appendix C.

The Phase Two property has the property identification number (PIN) 043590054. The legal description of the Phase Two property is PT LT 22, CON 2OF, AS IN CT109302; S/T GL81584 GLOUCESTER.

The approximate Universal Transverse Mercator (UTM) coordinates for the Phase One property centroid are Zone 18, 452460 m E and 5030325 m N. The UTM coordinates are based on measurements from Google Earth Pro, published by the Google Limited Liability Company (LLC). The accuracy of the centroid is estimated to be less than 10 m.

### 1.2 Property Ownership

The Site will be owned on November 17<sup>th</sup>, 2021 by Mr. Saël Nemorin. Authorization to proceed with this investigation was provided by Mr. Nemorin. Contact information for Mr. Nemorin is 100-135 Laurier Avenue West, Ottawa, Ontario, K1P 5J2.

### 1.3 Current and Proposed Future Use

The Phase Two property consists of a bungalow with a full basement. A paved driveway and detached single-car garage are present on the east side of the property. The proposed 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 2 SCS in a potable groundwater condition for a commercial property use. The selection of this category was based on the following factors:

- Bedrock is greater 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, however, there are 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 commercial 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 is located at 1568 Meadowbrook Road in Ottawa, Ontario. The Phase Two property is located within a residential area on the south side of Meadowbrook Road and has an area of approximately 0.14 hectares. The Site consists of a one-storey residential dwelling with a full basement. A paved driveway and detached single-car garage are present on the east side of the property.

A site plan showing the site is presented as Figure 2 in Appendix A.

The Phase Two property is located in a residential area. Potable water is available from the City of Ottawa, and there are no potable water wells nearby.

There are no water bodies on the subject site. The closest body of water is an unnamed water source tributary to Green's Creek approximately 330 m to the west. The Rideau River is located approximately 50 m to the southwest. Topographically, the Phase Two property is relatively flat. Based on local topography, the groundwater flow at the Phase Two property is anticipated to be southeast towards Green's Creek.

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 not 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.

Bedrock in the general area of the Phase Two property consists of limestone, dolostone, siltstone and shale of the Georgian Bay Formation. Native surficial soil consists of fine textured glaciomarine deposits of silt and clay.

### 2.2 Past Investigations

EXP prepared a report entitled *Phase One Environmental Site Assessment, 1568 Meadowbrook Road, Ottawa, Ontario* dated November 16, 2021. The following PCAs were identified:

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

No other PCAs that took place within the Phase Two study area were identified.

Based on the results of the Phase One ESA, EXP identified one area of potential environmental concern (APEC). Table 2.1 provides details of the APEC.

**Table 2.1: Findings of Phase One ESA**

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)
<b>APEC #1</b>	Entire Phase One property	PCA#30 – Imported Fill Material of Unknown Quality	On-Site	BTEX, PHC, 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 three boreholes on the subject property;
- Submitting soil samples from the monitoring wells for laboratory analysis of BTEX, PHC, 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 the three boreholes that were sampled; 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, fire insurance plans and other records review, it appears the subject site was first developed as a residence circa 1976.

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

No off-site PCA were identified.

The Phase Two study area and PCA is provided as Figure 3 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 One property (PCA #30 – Imported Fill Material of Unknown Quality (PCA 1))

### 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 October 28, 2021, EXP oversaw drilling of three (3) boreholes on the subject site by Marathon Drilling as part of a Geotechnical Investigation. 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  $\pm 10\%$  of the standard gas value, then the instrument is deemed to be calibrated, however if the readings are greater than  $\pm 10\%$  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 BTEX, PHC, PAH, and metals.



## 4.7 Groundwater: Sampling

As no groundwater APECs were identified, no groundwater samples were collected for laboratory analysis as part of the Phase Two ESA.

## 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

The contracted laboratory selected to perform chemical analysis on all soil samples was Bureau Veritas (BV) Laboratories. BV is an accredited laboratory 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, Bureau Veritas Laboratories (BV Labs). Bureau Veritas Laboratories is 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.

Bureau Veritas Laboratories 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 H). 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 a thin layer of fill in one borehole overlying brown/grey, sand and gravel glacial till, to a maximum depth of 10.9 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

Underlying approximately 0.15 m of topsoil was approximately 0.7 m to 1.5 m of sandy fill material with some gravel was encountered. No indications of petroleum impact were identified in the fill. No debris was encountered in the fill material.

#### Native Material

Underlying the fill material was interbedded sandy silt and silty clay to a maximum depth of 3.0 m. Underlying the silt and clay was grey glacial till consisting of silty sand with rock fragments. There were no indications of impact to the native soil.

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

Refer to the geological cross sections in Figures 9 to 14 for an overview of the Phase Two property stratigraphy.

#### Bedrock

Black shale bedrock was encountered in each borehole at depths ranging from 3.4 m to 3.6 m.

### 5.2 Groundwater: Elevations and Flow Direction

Three standpipes were advanced as part of this Geotechnical Investigation. Groundwater elevations and water levels were measured at the Phase Two property on November 10, 2021. Groundwater was encountered at depths ranging from 0.99 metres in BH21-3 to 2.83 m in BH21-1. 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)	Top of Casing Elevation (MASL)	November 10, 2021	
			Water Level (m bsg)	Water Level (MASL)
BH21-1	71.43	71.54	2.83	68.60
BH21-2	71.38	71.84	2.16	69.22
BH21-3	71.49	71.65	0.99	70.50

**Note:** Elevations were referenced using a high precision GPS unit and a geodetic datum.

MASL – metres above sea level

Based on the groundwater elevations, a groundwater contour plan was prepared. The groundwater flow direction was calculated to be to the northwest. 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

Fill samples were screened during the borehole advancement; however, no soil samples were submitted for analysis.

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 E.

The MECP Table 3 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 Table 3 SCS.

#### PHC including BTEX

Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of PHC and BTEX. The concentrations of PHC and BTEX measured in the analysed soil samples were less than MECP 2011 Table 3 SCS, as shown in Table 1 in Appendix B. The BTEX and PHC results are shown on Figures 6, 9, and 12 in Appendix A.

#### Metals

Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of metals. The concentrations of metals measured in the analysed soil samples were less than the MECP 2011 Table 3 SCS, as shown in Table 2 in Appendix B. The metals results are shown on Figures 7, 11, and 13 in Appendix A.

#### PAH

Three (3) soil samples, plus one blind duplicate, were submitted for the chemical analysis of PAH. The concentrations of PAHs measured in the analysed soil samples were less than the MECP 2011 Table 3 SCS, as shown in Table 3 in Appendix B. The PHC results are shown on Figures 8, 11, and 14 in Appendix A.

### 5.7 Chemical Transformation and Contaminant Sources

There are no soil exceedances of the MECP Table 3 SCS and therefore chemical transformations are not a concern at the Phase Two property. Based on the soil analytical results, the soil on the site is not impacted and the soil in the drums can be disposed of onto the Phase Two property.

### 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 soil concentrations are provided in Table 4 in Appendix D.

## 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

Bureau Veritas 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 prepared by BV Labs. 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 5 to 7 in Appendix D. All of the RPD were either not calculable or within the applicable alert limits, with the exception of copper, lead, thallium and zinc in soil which exceeded the alert limits. The metals RPDs indicate a heterogeneity in the two soil samples.

Certificates of Analysis (COA) were received from BV Labs reporting the results of all the chemical analyses performed on the submitted soil and groundwater. Copies of the COA are provided in Appendix E. 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 BV 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 Nemorin Group Limited to complete a Phase Two Environmental Site Assessment (ESA) of the property located at 1568 Meadowbrook Road, 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 Two ESA prepared by EXP.

EXP understands that the most recent use of the Phase Two property is residential and that the proposed future use will be 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 One property is located at 1568 Meadowbrook Road in Ottawa, Ontario. The Phase One property is located within a residential area on the south side of Meadowbrook Road and has an area of approximately 0.14 hectares. The Phase One property has the property identification number (PIN) 043590054. The legal description of the Phase One property is PT LT 22, CON 20F, AS IN CT109302; S/T GL81584 GLOUCESTER.

Based on a review of historical aerial photographs, and other records review, it appears the subject site was first developed as a residential property circa 1976. Prior to the development of the building, the Site was used for agricultural purposes.

There are no water bodies on the subject site. The closest body of water is an unnamed water source tributary to Green's Creek approximately 330 m to the west. The Rideau River is located approximately 50 m to the southwest. Topographically, the Phase One property is relatively flat. Based on local topography, the groundwater flow at the Phase One property is anticipated to be southeast towards Green's Creek.

Refer to Table 5.1 for the Site identification information.

**Table 5.1: Site Identification Details**

<b>Civic Address</b>	1568 Meadowbrook Road, Ottawa, Ontario
<b>Current Land Use</b>	Residential
<b>Proposed Future Land Use</b>	Residential
<b>Property Identification Number</b>	043590054
<b>UTM Coordinates</b>	NAD83 Zone 18, 452460 m E and 5030325 m N
<b>Site Area</b>	0.14 hectares
<b>Property Owner</b>	Nemorin Group Limited

Potable water is available from the City of Ottawa, however, there are no potable water wells within the Phase Two study area. There are no water bodies on the subject site. The closest body of water is an unnamed water source tributary to Green's Creek approximately 330 m to the east. Topographically, the Phase Two property is relatively flat. Based on local topography, the groundwater flow at the Phase Two property is anticipated to be southeast towards Green's Creek.

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 not 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

The terrain at the Phase Two property consisted of silty sand and gravel fill to a maximum depth of 1.8 m. The upper 0.7 m of fill at MW21-3 had some small pieces of brick and asphalt. Underlying the fill was brown to grey clay to a maximum depth of 11.3 m and then clayey sand with gravel was observed to the maximum depth drilled of 15.8 m. Bedrock was not encountered during drilling, however cone refusal was at 22.7 m indicating bedrock may be at that depth.

Based on the geological profile, cross-sections of the site were prepared, as shown on Figures 9 to 14 Appendix A. The groundwater flow direction was calculated to be to the northwest. The groundwater contour plan is provided as Figure 5 in Appendix A.

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	3.4 mbgs
Minimum Depth to Overburden Groundwater	0.99 mbgs (November 10, 2021)
Shallow Soil Property	No, bedrock is more than 2.0 mbgs
Proximity to water body or ANSI	330 m west
Soil pH	8.46
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 approximate location of underground utilities was based on locates obtained prior to drilling. The underground utility corridors for hydro, gas, phone, sanitary sewer, and municipal water are typically present within 3 metres of ground surface, while the water table is approximately 1.0 metres below ground surface; therefore, it is possible that the presence of subsurface utilities has affected the direction of groundwater flow.

### 5.9.5 Potentially Contaminating Activities

Ontario Regulation (O. Reg.) 153/04 defines a Potential Contaminating Activity (PCA) as one of fifty-nine (59) industrial operations set out in Table 2 of Schedule D that occurs or has occurred in the Phase One study area. The following PCA were identified for the Phase One property and the Phase One study area:

The following PCAs were identified:

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

No other PCAs that took place within the Phase Two study area were identified.

### 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)
<b>APEC #1</b>	Entire Phase One property	PCA#30 – Imported Fill Material of Unknown Quality	On-Site	BTEX, PHC, PAH, metals	Soil

### 5.9.7 Investigation

The Phase Two ESA was conducted to assess the soil quality at the Phase Two property. As indicated in the APEC and PCOC Table (above), the analytical program of the Phase Two ESA included testing of soil for metals, BTEX, PHC, and PAH. The borehole locations are shown on Figure 3 in Appendix A.

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

- The Phase Two ESA consisted of advancing a total of three (3) boreholes to investigate the quality of fill on the property which was identified in this Phase One and Two ESA. A worst case sample of the fill material was submitted for laboratory analysis of Petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene and xylenes (BTEX), metals, polycyclic aromatic hydrocarbons (PAH).
- The stratigraphy at the Phase Two property, as observed in the boreholes, consisted of a thin layer of topsoil overlying 0.7 m to 1.5 m of fill consisting of sand with some gravel. Underlying the fill material was interbedded sandy silt and silty clay to a maximum depth of 3.0 m. Underlying the silt and clay was grey glacial till consisting of silty sand with rock fragments. Shale bedrock was found between 3.4 and 3.6 m below ground surface (bgs).
- Based on the groundwater elevations measured in the three standpipes, the groundwater flow direction was calculated to be to the northwest.
- The concentrations of BTEX, PHCs, PAHs and metals in the analyzed soil samples were less than the 2011 MECP Table 3 SCS.
- Based on the results of the Phase Two ESA, no further environmental action is recommended at this time.

### 5.9.8 Contaminants of Concern

There are no soil exceedances of the MECP Table 3 SCS and there are no COC in soil.

### 5.9.9 Contaminant Fate and Transport

#### **Soil Media**

No impacted soil was identified at the Phase Two property.

#### **Human Health Receptors and Exposure Pathways**

No impacted soil was identified at the Phase Two property.

#### **Ecological Receptors and Exposure Pathways**

No impacted soil was identified at the Phase Two property.



## 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 three (3) boreholes to investigate the quality of fill on the property which was identified in this Phase One and Two ESA. A worst case sample of the fill material was submitted for laboratory analysis of Petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene and xylenes (BTEX), metals, polycyclic aromatic hydrocarbons (PAH).
- The stratigraphy at the Phase Two property, as observed in the boreholes, consisted of a thin layer of topsoil overlying 0.7 m to 1.5 m of fill consisting of sand with some gravel. Underlying the fill material was interbedded sandy silt and silty clay to a maximum depth of 3.0 m. Underlying the silt and clay was grey glacial till consisting of silty sand with rock fragments. Shale bedrock was found between 3.4 and 3.6 m below ground surface (bgs).
- Based on the groundwater elevations measured in the three standpipes, the groundwater flow direction was calculated to be to the northwest.
- The concentrations of BTEX, PHCs, PAHs and metals in the analyzed soil samples were less than the 2011 MECP Table 3 SCS.
- Based on the results of the Phase Two ESA, no further environmental action is recommended at this time.

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](http://www.ccme.ca/en/resources/canadian_environmental_quality_guidelines), Accessed November 2018.
- EXP Services Inc., *Phase I Environmental Site Assessment*, 233 Argyle Avenue, Ottawa, Ontario, March 19, 2021.
- 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 Smart Living Properties ("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

*Nemorin Group Limited  
Phase Two Environmental Site Assessment  
1568 Meadowbrook Road, Ottawa, Ontario  
OTT-21019403-A0  
November 30, 2021*

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.

*Nemorin Group Limited  
Phase Two Environmental Site Assessment  
1568 Meadowbrook Road, Ottawa, Ontario  
OTT-21019403-A0  
November 30, 2021*

## 9.0 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.



Mark McCalla, P. Geo.  
Senior Geoscientist  
Earth and Environment



Patricia Stelmack, M.Sc., P.Eng.  
Team Lead/Senior Project Manager  
Earth and Environment

EXP Services Inc.

*Nemorin Group Limited*

*Phase Two Environmental Site Assessment*

*1568 Meadowbrook Road, Ottawa, Ontario*

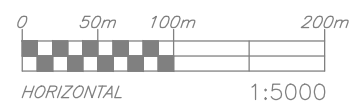
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November 30, 2021

## Appendix A: Figures



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**exp Services Inc.**  
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DESIGN	IT
DRAWN	GC
DATE	NOV. 2021
FILE NO	OTT-21019403-A0

**GEOTECHNICAL INVESTIGATION  
PROPOSED RESIDENTIAL DEVELOPMENT  
1568 MEADOWBROOK ROAD, OTTAWA, ON  
NEMOURIN GROUP LTD.**

**BOREHOLE LOCATION PLAN**

SCALE	1:5000
SKETCH NO	

**FIG 1**



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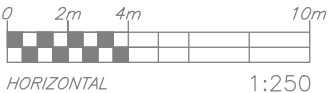



LEGEND

 **BH-1**  
**71.43**      BOREHOLE NO. & LOCATION  
GROUND SURFACE ELEVATION

NOTES:

1. THE BOUNDARIES AND SOIL TYPES HAVE BEEN ESTABLISHED ONLY AT BOREHOLE LOCATIONS. BETWEEN BOREHOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. SOIL SAMPLES WILL BE RETAINED IN STORAGE FOR THREE MONTHS AND THEN DESTROYED UNLESS THE CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. TOPSOIL QUANTITIES SHOULD NOT BE ESTABLISHED FROM THE INFORMATION PROVIDED AT THE BOREHOLE LOCATIONS.
4. BOREHOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING(S) OR FLOOR SLABS OR PARKING LOT(S) GRADES.
5. THIS DRAWING FORMS PART OF THE REPORT PROJECT NUMBER AS REFERENCED AND SHOULD BE USED ONLY IN CONJUNCTION WITH THIS REPORT.
6. BASE PLAN INFORMATION OBTAINED FROM EXP SURVEY CONDUCTED NOVEMBER 15, 2021.






<div>exp Services Inc. 100-2650 Queensview Drive Ottawa, ON K2B 8H6 www.exp.com</div> <div></div>	DESIGN IT	<div>GEOTECHNICAL INVESTIGATION PROPOSED RESIDENTIAL DEVELOPMENT 1568 MEADOWBROOK ROAD, OTTAWA, ON NEMOURIN GROUP LTD.</div> <div>BOREHOLE LOCATION PLAN</div>	<div>SCALE 1:250</div> <div>SKETCH NO</div> <div>FIG 2</div>
	DRAWN GC		
	DATE NOV. 2021		
	FILE NO OTT-21019403-A0		

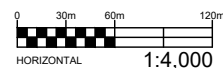


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### LEGEND

-  PROPERTY BOUNDARY
-  STUDY AREA (250m)
-  INFERRED GROUNDWATER FLOW DIRECTION



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DATE  
OCTOBER 2021

DESIGN  
MM

CHECKED  
MM

DRAWN BY  
TM

CLIENT:

**NEMORIN GROUP LIMITED**

TITLE:

**PHASE ONE STUDY AREA**  
**1568 MEADOWBROOK ROAD, OTTAWA, ONTARIO**

project no.

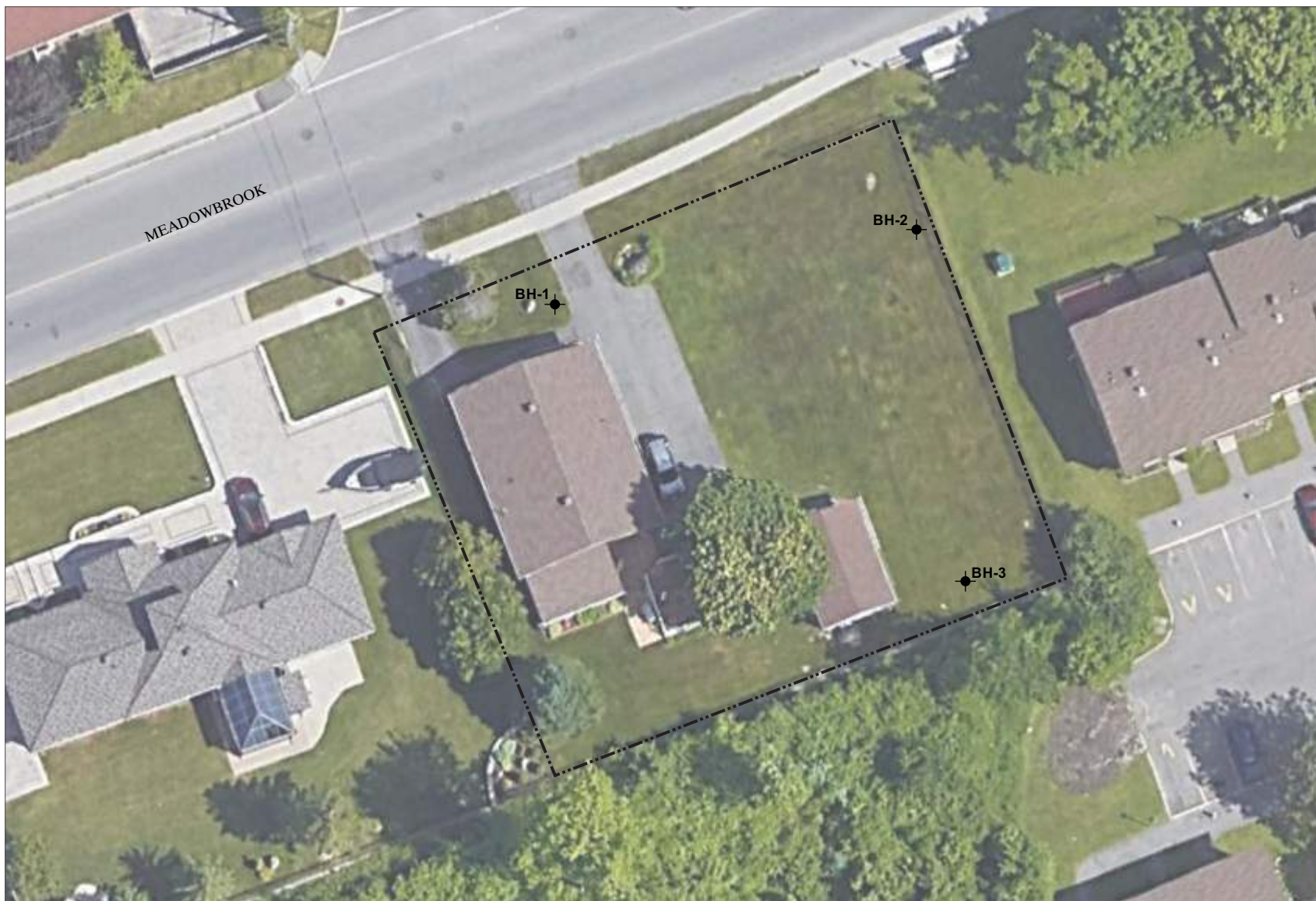
OTT-21019403-A0

scale

1:4,000

**FIG 3**





SCALE: 0 5 10m

**SOURCE:**

BASED ON GOOGLE EARTH DATED  
2021 AND FIELD MEASUREMENTS BY  
EXP STAFF



DRAWN  
BY  
K.G.

CHECKED  
BY  
M.M.

**LEGEND:**

- SITE BOUNDARY
- ✦ TEST HOLE WITH MONITOR  
(EXP, 2021)

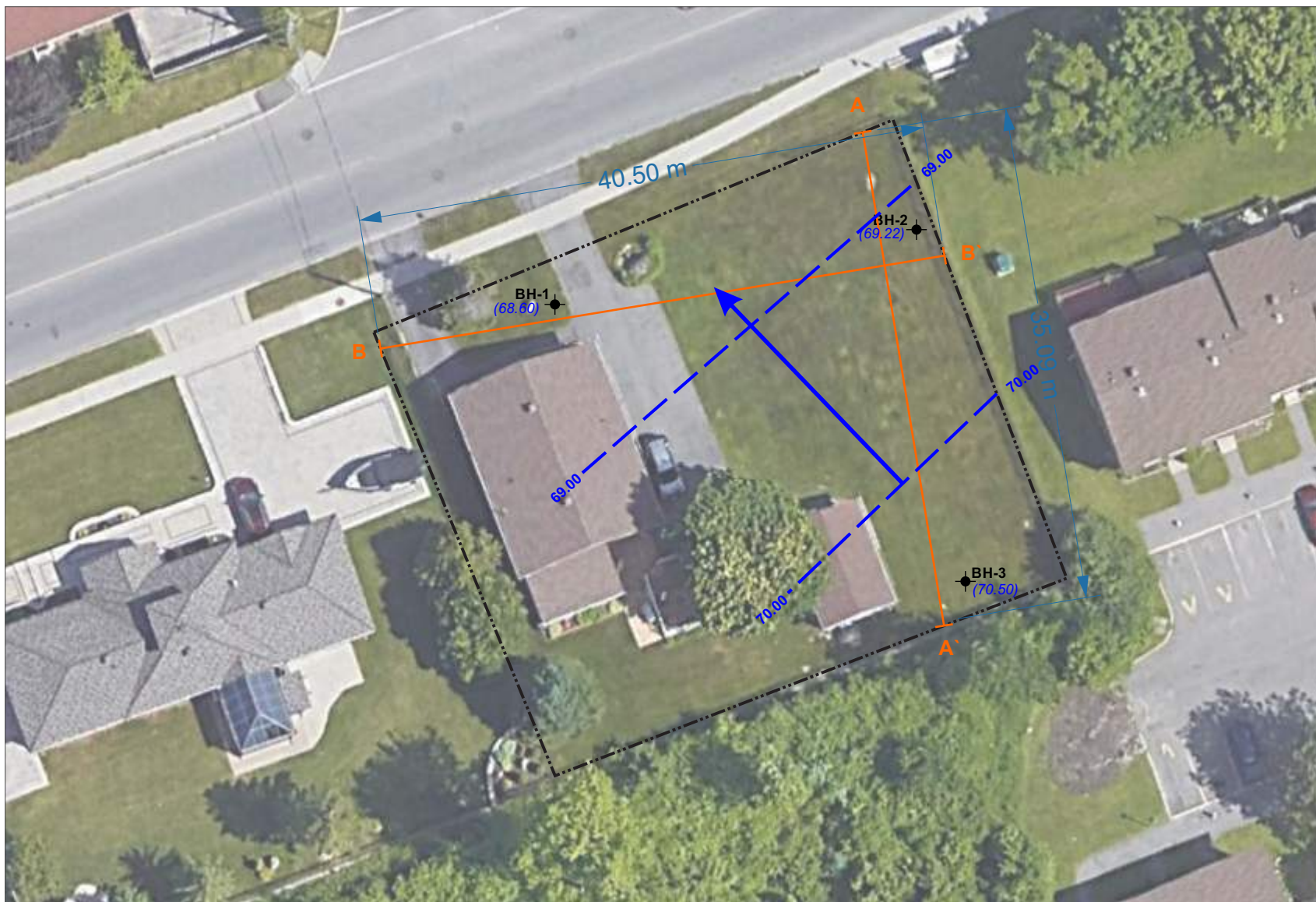
**SITE PLAN**

FIGURE

**4**

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 | DATE: NOVEMBER 2021



SCALE: 0 5 10m

**SOURCE:**

BASED ON GOOGLE EARTH DATED  
2021 AND FIELD MEASUREMENTS BY  
EXP STAFF



DRAWN  
BY  
K.G.

CHECKED  
BY  
M.M.

**LEGEND:**

- SITE BOUNDARY
- TEST HOLE WITH MONITOR  
(EXP, 2021)
- CROSS SECTION LOCATION

- (100.00) GROUND WATER ELEVATION (m)
- 100.00 GROUND WATER ELEVATION  
CONTOUR (m)
- GROUND WATER FLOW DIRECTION

**GROUND WATER  
CONTOUR PLAN  
(DECEMBER 13, 2017)**

5

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 DATE: NOVEMBER 2021



Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4
BH-1 SS2	27/10/2021	0.75 - 1.2	<0.020	<0.020	<0.020	<0.020	<10	<10	<50	<50
DUP1	27/10/2021	0.75 - 1.2	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50



PARAMETERS	ABBREVIATION	REG 153/04
Benzene	B	0.21
Toluene	T	2.3
Ethylbenzene	E	2
Total Xylenes	X	3.1
F1 (C6-C10)	F1	55
F2 (C10-C16)	F2	98
F3 (C16-C34)	F3	300
F4 (C34-C50)	F4	2800

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4
BH-3 SS1	27/10/2021	0.0 - 0.75	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4
BH-2 SS1	27/10/2021	0.0 - 0.75	<0.020	<0.042	<0.020	<0.040	<10	<10	<50	<50

SCALE: 0 5 10m

#### SOURCE:

BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF



DRAWN BY	CHECKED BY
K.G.	M.M.

#### LEGEND:

- SITE BOUNDARY
- ✦ TEST HOLE WITH MONITOR (EXP, 2021)

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH COARSE TEXTURED SOILS. ~ INDICATES FIELD DUPLICATE SAMPLE. ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED. mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN. CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

#### SOIL ANALYTICAL RESULTS – PHCs AND VOCs

6

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 DATE: NOVEMBER 2021

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH-1 SS2	27/10/2021	0.75 - 1.2	<0.20	2.3	96	0.63	6.5	0.11	27	10	22	7.5	0.83	22	<0.50	<0.20	0.19	0.72	37	40
DUP1	27/10/2021	0.75 - 1.2	<0.20	2.7	100	0.64	6.4	<0.10	28	9.9	24	7.0	0.91	22	<0.50	<0.20	0.19	0.65	38	43



PARAMETERS	ABBREVIATION	REG 153/04
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Molybdenum	Mo	6.9
Nickel	Ni	100
Selenium	Se	2.4
Silver	Ag	20
Thallium	Tl	1
Uranium	U	23
Vanadium	V	86
Zinc	Zn	340

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH-3 SS1	27/10/2021	0.0 - 0.75	<0.20	3.4	100	0.41	<5.0	0.12	26	6.1	14	38	0.80	16	<0.50	<0.20	0.11	0.92	28	50

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH-2 SS1	27/10/2021	0.0 - 0.75	<0.20	7.3	100	0.48	<5.0	0.21	26	7.5	14	19	1.0	19	<0.50	<0.20	0.15	0.85	30	51

SCALE: 0 5 10m

#### SOURCE:

BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF



DRAWN BY	CHECKED BY
K.G.	M.M.

#### LEGEND:

- SITE BOUNDARY
- ✦ TEST HOLE WITH MONITOR (EXP, 2021)

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH COARSE TEXTURED SOILS.  
~ INDICATES FIELD DUPLICATE SAMPLE.  
ALL RESULTS IN UNITS OF µg/g, UNLESS OTHERWISE NOTED.  
mbgs - METRES BELOW GROUND SURFACE.

LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN.  
CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

## SOIL ANALYTICAL RESULTS – METALS

7

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 DATE: NOVEMBER 2021



Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	T-MN	N	P	Py
BH-1 SS2	27/10/2021	0.75 - 1.2	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050
DUP1	27/10/2021	0.75 - 1.2	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050



PARAMETERS	ABBREVIATION	REG 153/04
Acenaphthene	Ace	7.9
Acenaphthylene	Acy	0.15
Anthracene	An	0.67
Benzo(a)anthracene	B(a)A	0.5
Benzo(a)pyrene	B(a)P	0.3
Benzo(b)fluoranthene	B(b)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
Total Methylnaphthalene	T-MN	0.99
Naphthalene	N	0.6
Phenanthrene	P	6.2
Pyrene	Py	78

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	T-MN	N	P	Py
BH-3 SS1	27/10/2021	0.0 - 0.75	<0.0050	<0.0050	0.0058	0.016	0.016	0.026	0.012	0.0084	0.017	<0.0050	0.037	<0.0050	0.013	0.013	<0.0050	0.027	0.033

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	Fl	F	I(123)P	T-MN	N	P	Py
BH-2 SS1	27/10/2021	0.0 - 0.75	<0.0050	<0.0050	<0.0050	0.0072	0.0090	0.016	0.0083	<0.0050	0.0094	<0.0050	0.018	<0.0050	0.0084	<0.0071	<0.0050	0.010	0.015

SCALE: 0 5 10m

#### SOURCE:

BASED ON GOOGLE EARTH DATED 2021 AND FIELD MEASUREMENTS BY EXP STAFF



DRAWN BY	CHECKED BY
K.G.	M.M.

#### LEGEND:

--- SITE BOUNDARY

✦ TEST HOLE WITH MONITOR (EXP, 2021)

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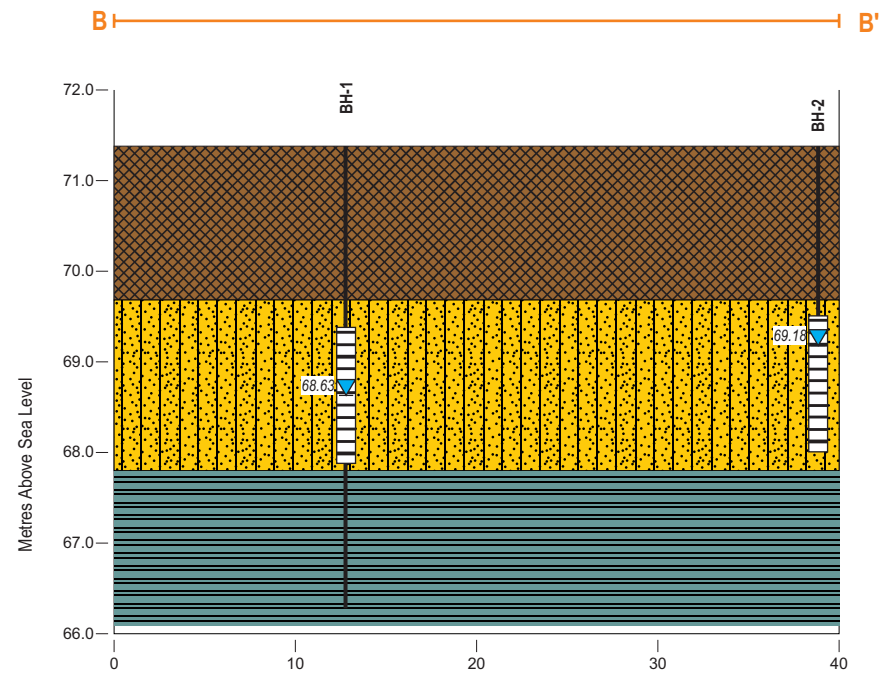
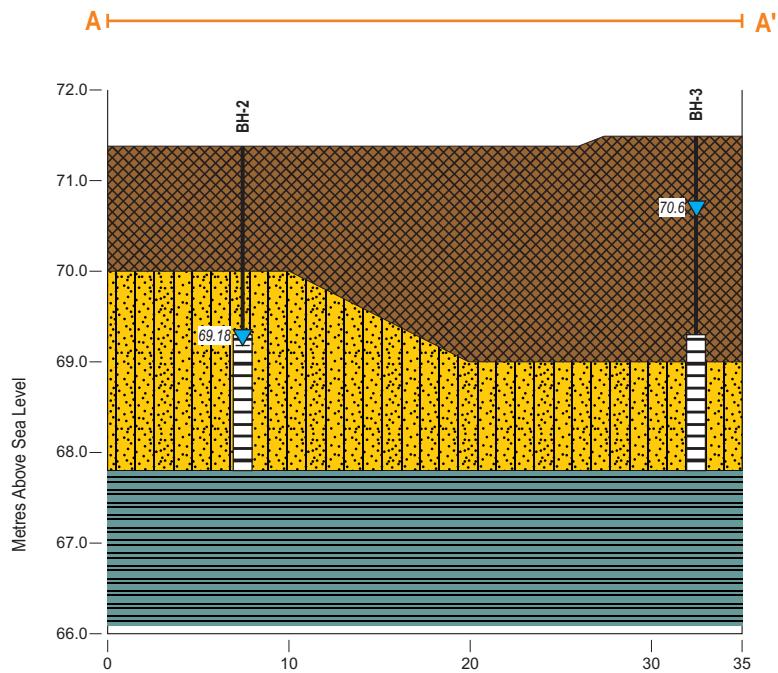
LOCATION WHERE SAMPLE IS WITHIN TABLE 3 STANDARDS FOR ALL PARAMETERS ANALYZED IS SHOWN IN GREEN. CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN IN TEXT AS GREEN.

#### SOIL ANALYTICAL RESULTS – PAHs

8

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 DATE: NOVEMBER 2021



**SCALE:**  
5 X VERTICAL EXAGGERATION

**SOURCE:**  
BASED ON FIELD  
MEASUREMENTS BY EXP STAFF



DRAWN  
BY  
K.G.

CHECKED  
BY  
M.M.

**LEGEND:**

TEST HOLE

SCREEN INTERVAL

GROUND WATER  
ELEVATION  
(OCTOBER 27, 2021)

METRES ABOVE  
SEA LEVEL

FILL

GLACIAL TILL

SHALE BEDROCK

masl

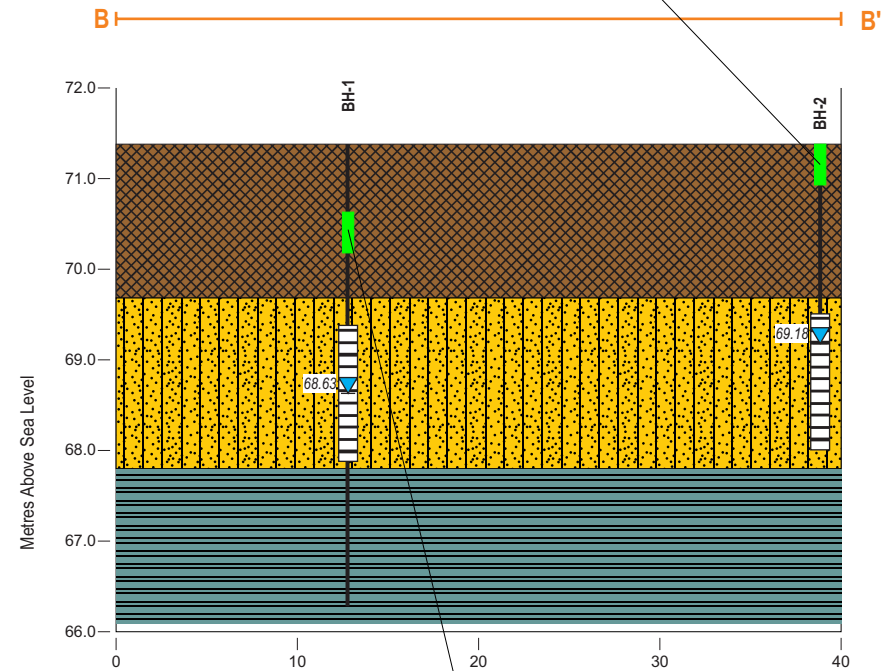
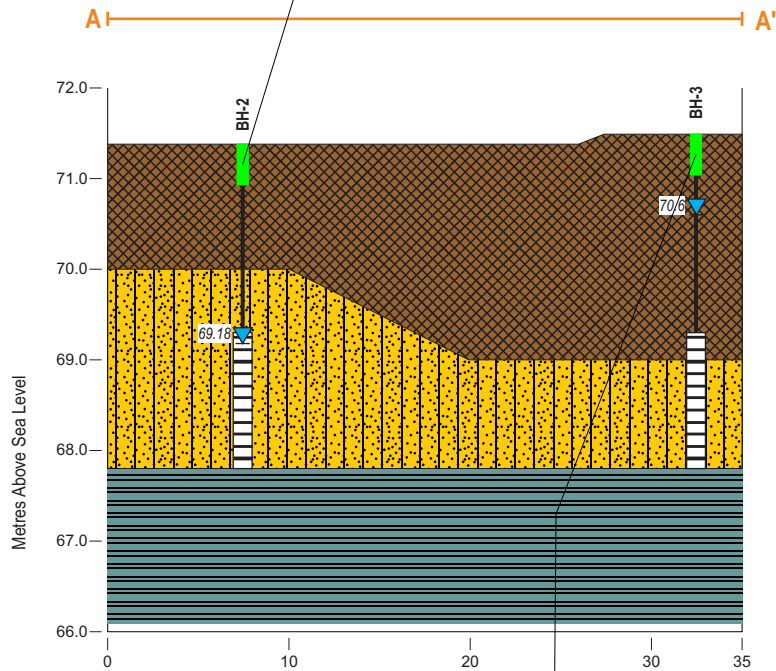
**CROSS SECTIONS  
A-A' AND B-B'  
GEOLOGY**

\*

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 | DATE: NOVEMBER 2021

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4
BH-2 SS1	27/10/2021	0.0 - 0.75	<0.020	<0.042	<0.020	<0.040	<10	<10	<50	<50



PARAMETERS	ABBREVIATION	REG 153/04
Benzene	B	0.21
Toluene	T	2.3
Ethylbenzene	E	2
Total Xylenes	X	3.1
F1 (C6-C10)	F1	55
F2 (C10-C16)	F2	98
F3 (C16-C34)	F3	300
F4 (C34-C50)	F4	2800

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4
BH-1 SS2	27/10/2021	0.75 - 1.2	<0.020	<0.020	<0.020	<0.020	<10	<10	<50	<50
DUP1	27/10/2021	0.75 - 1.2	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50

Sample ID	Date	Depth (m)	B	T	E	X	F1	F2	F3	F4
BH-3 SS1	27/10/2021	0.0 - 0.75	<0.020	<0.020	<0.020	<0.040	<10	<10	<50	<50

**SCALE:**  
5 X VERTICAL EXAGGERATION

**SOURCE:**  
BASED ON FIELD  
MEASUREMENTS BY EXP STAFF



DRAWN  
BY  
K.G.

CHECKED  
BY  
M.M.

**LEGEND:**

TEST HOLE  
SCREEN INTERVAL  
GROUND WATER  
ELEVATION  
(OCTOBER 27, 2021)  
masl METRES ABOVE  
SEA LEVEL

FILL  
GLACIAL TILL  
SHALE BEADROCK

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT  
STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE  
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GROUNDWATER WITH COARSE TEXTURED SOILS.  
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CONCENTRATION OF CONTAMINANT WITHIN TABLE 3 STANDARD SHOWN  
IN TEXT AS GREEN.

**CROSS SECTIONS  
A-A' AND B-B'  
SOIL ANALYTICAL RESULTS  
- PHCs AND VOCs**

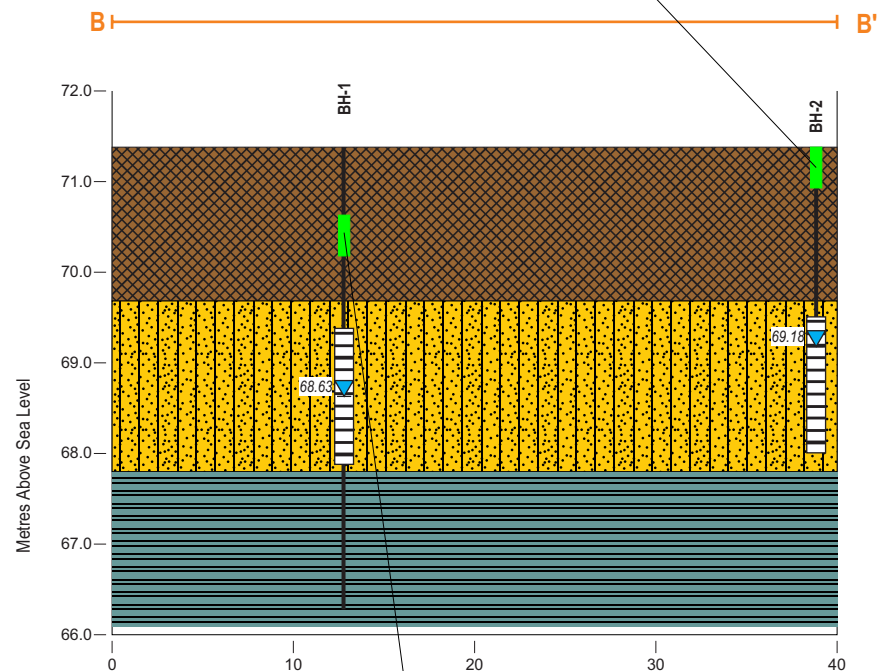
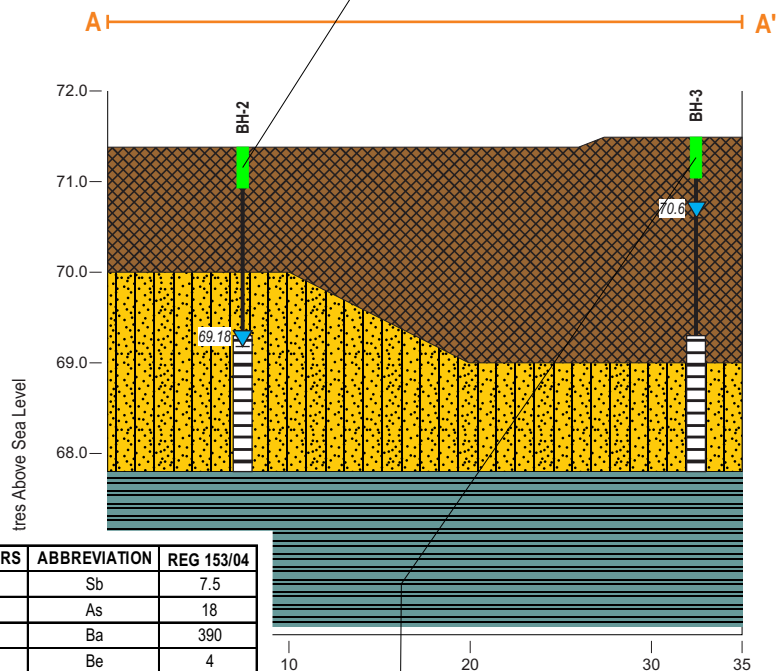
9

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 DATE: NOVEMBER 2021



Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH-2 SS1	27/10/2021	0.0 - 0.75	<0.20	7.3	100	0.48	<5.0	0.21	26	7.5	14	19	1.0	19	<0.50	<0.20	0.15	0.85	30	51



PARAMETERS	ABBREVIATION	REG 153/04
Antimony	Sb	7.5
Arsenic	As	18
Barium	Ba	390
Beryllium	Be	4
Boron	B	120
Cadmium	Cd	1.2
Chromium	Cr	160
Cobalt	Co	22
Copper	Cu	140
Lead	Pb	120
Molybdenum	Mo	6.9
Nickel	Ni	100
Selenium	Se	2.4
Silver	Ag	20
Thallium	Tl	1
Uranium	U	23
Vanadium	V	86
Zinc	Zn	340

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH-1 SS2	27/10/2021	0.75 - 1.2	<0.20	2.3	96	0.63	6.5	0.11	27	10	22	7.5	0.83	22	<0.50	<0.20	0.19	0.72	37	40
DUP1	27/10/2021	0.75 - 1.2	<0.20	2.7	100	0.64	6.4	<0.10	28	9.9	24	7.0	0.91	22	<0.50	<0.20	0.19	0.65	38	43

Sample ID	Date	Depth (m)	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Ag	Tl	U	V	Zn
BH-3 SS1	27/10/2021	0.0 - 0.75	<0.20	3.4	100	0.41	<5.0	0.12	26	6.1	14	38	0.80	16	<0.50	<0.20	0.11	0.92	28	50

**SCALE:**  
5 X VERTICAL EXAGGERATION

**SOURCE:**  
BASED ON FIELD  
MEASUREMENTS BY EXP STAFF



DRAWN  
BY  
K.G.

CHECKED  
BY  
M.M.

**LEGEND:**

TEST HOLE  
SCREEN INTERVAL  
GROUND WATER  
ELEVATION  
(OCTOBER 27, 2021)  
METRES ABOVE  
SEA LEVEL

FILL  
GLACIAL TILL  
SHALE BEDROCK

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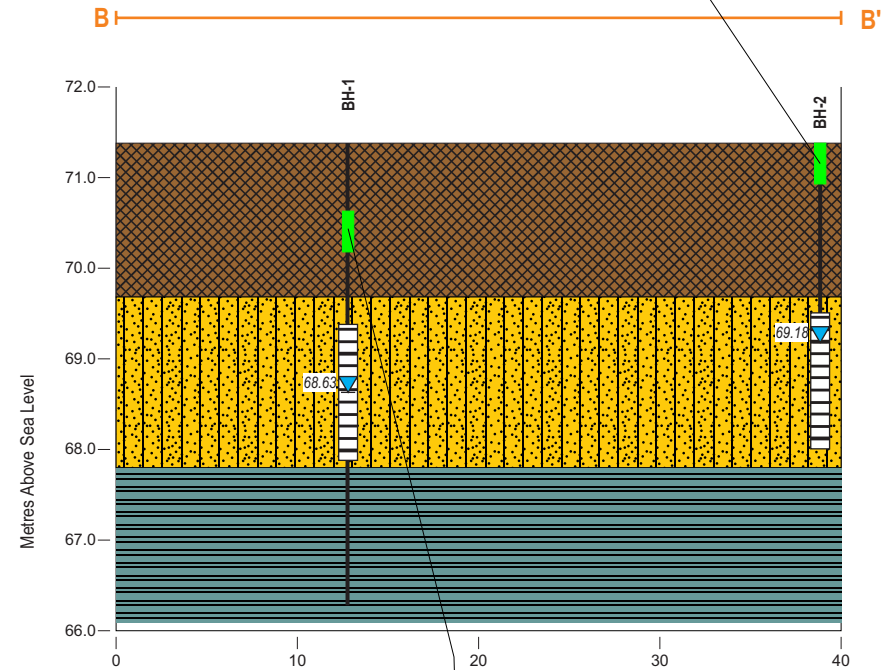
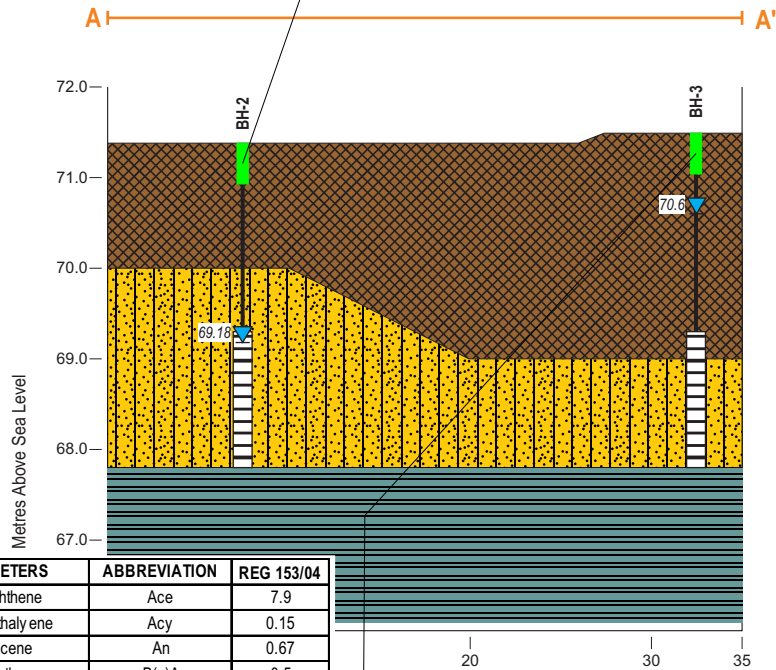
**CROSS SECTIONS  
A-A' AND B-B'  
SOIL ANALYTICAL RESULTS  
- METALS**

10

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 | DATE: NOVEMBER 2021

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH-2 SS1	27/10/2021	0.0 - 0.75	<0.0050	<0.0050	<0.0050	0.0072	0.0090	0.016	0.0083	<0.0050	0.0094	<0.0050	0.018	<0.0050	0.0084	<0.0071	<0.0050	0.010	0.015



PARAMETERS	ABBREVIATION	REG 153/04
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Anthracene	An	0.67
Benzo(a)anthracene	B(a)A	0.5
Benzo(a)pyrene	B(a)P	0.3
Benzo(b)fluoranthene	B(b)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
Total Methylnaphthalene	T-MN	0.99
Naphthalene	N	0.6
Phenanthrene	P	6.2
Pyrene	Py	78

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH-1 SS2	27/10/2021	0.75 - 1.2	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050
DUP1	27/10/2021	0.75 - 1.2	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0071	<0.0050	<0.0050	<0.0050

Sample ID	Date	Depth (m)	Ace	Acy	An	B(a)A	B(a)P	B(b)F	B(ghi)P	B(k)F	C	DA	FI	F	I(123)P	T-MN	N	P	Py
BH-3 SS1	27/10/2021	0.0 - 0.75	<0.0050	<0.0050	0.0058	0.016	0.016	0.026	0.012	0.0084	0.017	<0.0050	0.037	<0.0050	0.013	0.013	<0.0050	0.027	0.033

**SCALE:**  
5 X VERTICAL EXAGGERATION

**SOURCE:**  
BASED ON FIELD  
MEASUREMENTS BY EXP STAFF



**DRAWN BY**  
K.G.

**CHECKED BY**  
M.M.

**LEGEND:**

TEST HOLE

SCREEN INTERVAL

GROUND WATER  
ELEVATION  
(OCTOBER 27, 2021)

METRES ABOVE  
SEA LEVEL

FILL

GLACIAL TILL

SHALE BEADROCK

STANDARDS SHOWN ARE MECP SOIL, GROUND WATER AND SEDIMENT STANDARDS FOR USE UNDER PART XV.1 OF THE EPA, APRIL 2011, TABLE 3 FOR RESIDENTIAL TYPES OF PROPERTY USE AND NON-POTABLE GROUNDWATER WITH COARSE TEXTURED SOILS.  
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**CROSS SECTIONS  
A-A' AND B-B'  
SOIL ANALYTICAL RESULTS  
- PAHs**

11

1568 MEADOWBROOK ROAD,  
OTTAWA, ONTARIO

PROJECT NUMBER: 21019403 DATE: NOVEMBER 2021

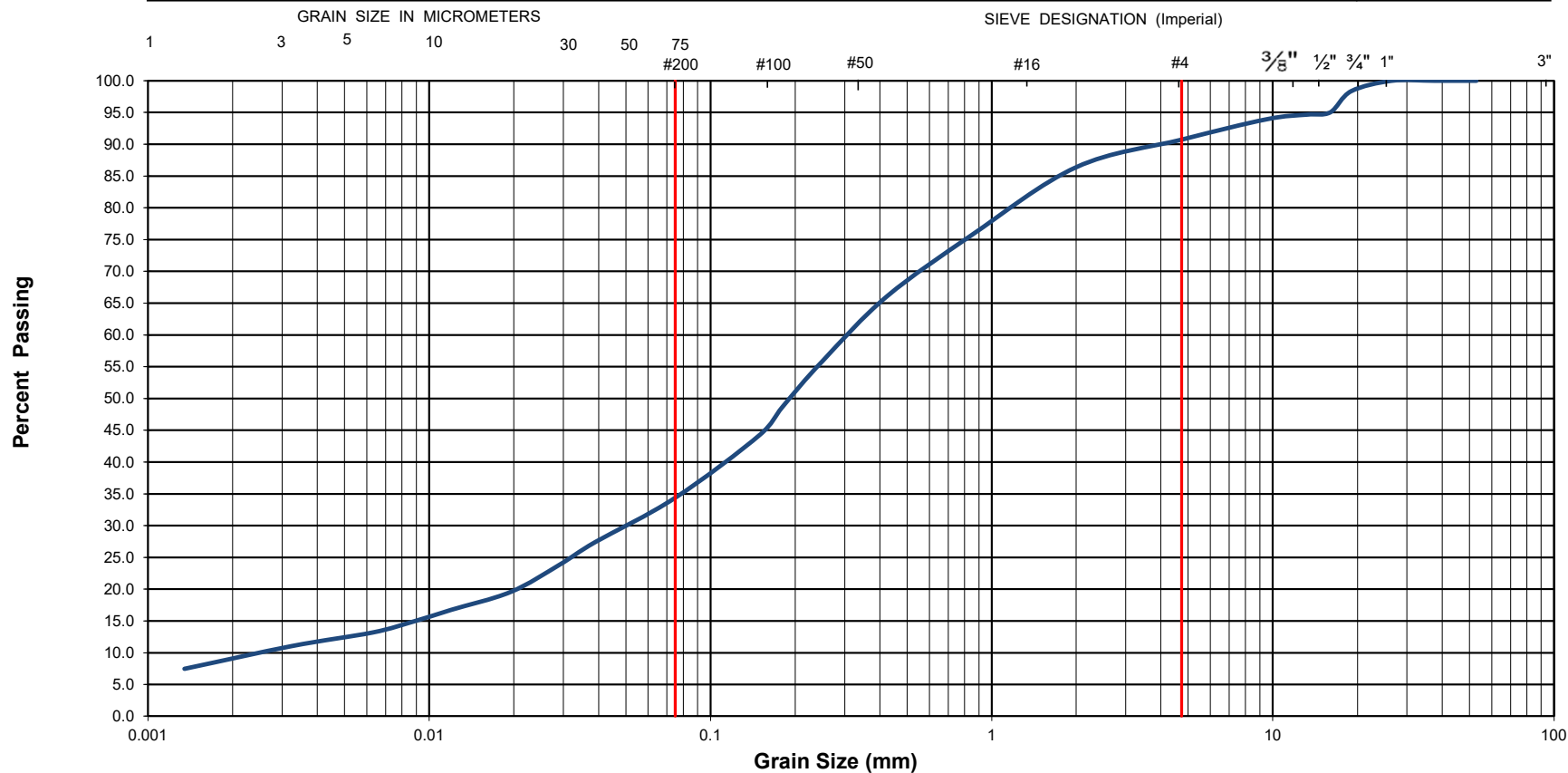


# **Grain-Size Distribution Curve** **Method of Test For Particle Size Analysis of Soil** **ASTM C-136/ASTM D422**

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

## **Unified Soil Classification System**

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



EXP Project No.:	OTT-21019403-A0	Project Name :	Geotechnical Investigation - 1568 Meadowbrook Road, Ottawa, Ontario			
Client :	Nemorin Group Limited	Project Location :	1568 Meadowbrook Road, Ottawa, ON			
Date Sampled :	October 27, 2021	Borehole No:	BH1	Sample No.:	SS3	Depth (m) : 1.5-2.1
Sample Description :	% Silt and Clay	34	% Sand	57	% Gravel	9
Sample Description :	Silty Sand (SM)					Figure : xxxx

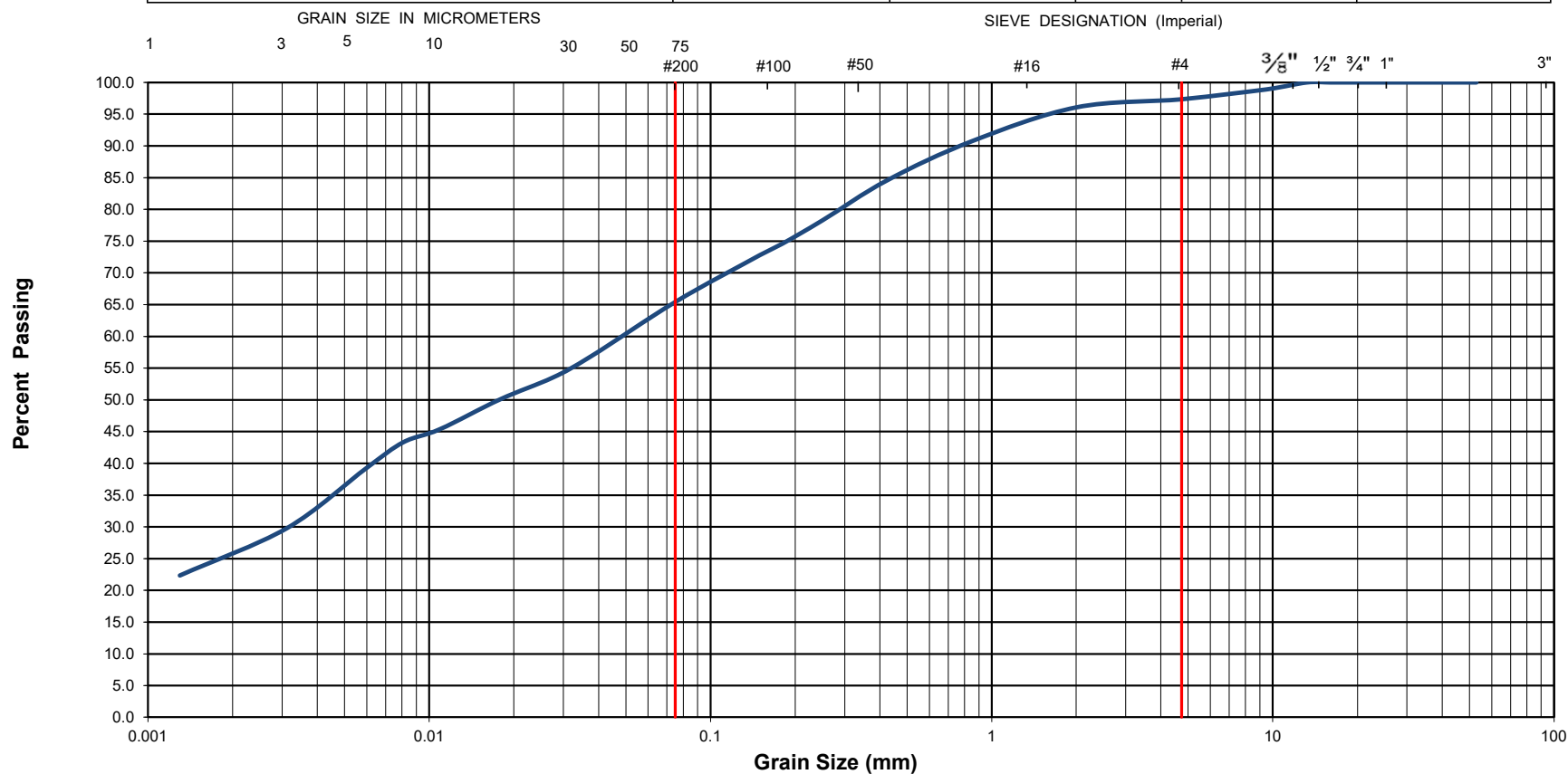


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**EXP Services Inc.**  
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 Ottawa, ON K2B 8H6

## **Unified Soil Classification System**

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



EXP Project No.:	OTT-21019403-A0	Project Name :	Geotechnical Investigation - 1568 Meadowbrook Road, Ottawa, Ontario			
Client :	Nemorin Group Limited	Project Location :	1568 Meadowbrook Road, Ottawa, ON			
Date Sampled :	October 27, 2021	Borehole No:	BH2	Sample No.:	SS2	Depth (m) : 0.8-1.4
Sample Description :	% Silt and Clay	65	% Sand	32	% Gravel	3
Sample Description :	Sandy Lean Clay (CL)					Figure : xxxx

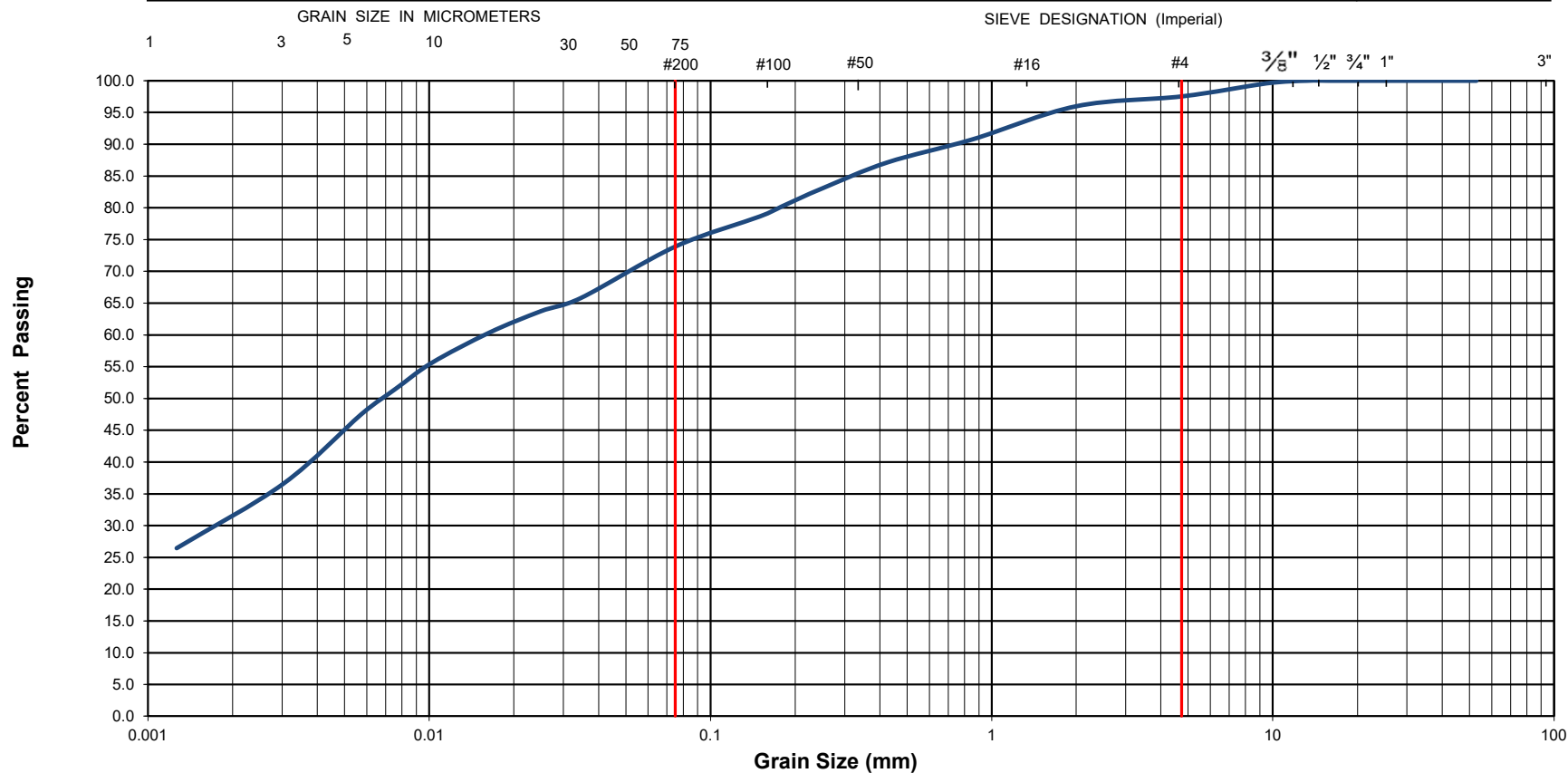


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## **Unified Soil Classification System**

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



EXP Project No.:	OTT-21019403-A0	Project Name :	Geotechnical Investigation - 1568 Meadowbrook Road, Ottawa, Ontario			
Client :	Nemorin Group Limited	Project Location :	1568 Meadowbrook Road, Ottawa, ON			
Date Sampled :	October 27, 2021	Borehole No:	BH3	Sample No.:	SS4	Depth (m) : 2.3-2.9
Sample Description :	% Silt and Clay	74	% Sand	23	% Gravel	3
Sample Description :	Lean Clay with Sand (CL)					Figure : xxxx

EXP Services Inc.

*Nemorin Group Limited*

*Phase Two Environmental Site Assessment*

*1568 Meadowbrook Road, Ottawa, Ontario*

*OTT-21019403-A0*

November 30, 2021

## Appendix B: Survey Plan



SITE PLAN OF PLAN OF SURVEY, PART OF  
LOT 22, CONCESSION 2 (OTTAWA FRONT),  
CITY OF OTTAWA

ZONING: R1WW CONVERTED TO R2?  
RESIDENTIAL FIRST DENSITY (SEC. 155-156) CITY OF OTTAWA;  
RESIDENTIAL SECOND DENSITY (SEC. 157-158) CITY OF OTTAWA;  
PROPOSED BUILDING TYPE: 4 x 2 STOREY, LONG-SEMI c/w SDUs  
2 x 3-BEDS + 2 x 1-BED EACH  
LOT DEPTH: 38.59m (120.05')  
ADJACENT ZONING:  
NORTH: R2N  
SOUTH: I1F (H15)  
WEST SIDE: R1WW  
EAST SIDE: R3Y170R  
SCHEDULE 1 AREA AREA 'C'  
SCHEDULE 1A AREA AREA 'C'

LOT INFO				
AFTER CONVERSION TO R2N - ALL LOTS				
P. STANDARD	1568 M. BROOK A REQUIRED	1568 M. BROOK PROPOSED	DETACHED EXISTING	NOTES
LOT WIDTH:	10m	9.915m	39.66m	
LOT AREA:	300m <sup>2</sup>	362.3m <sup>2</sup>	1451.2m <sup>2</sup>	
HEIGHT:	8.5m	8.00m	7.0m	
FRONT YARD:	5m	5.01m	9.36m	
CORNER YARD:	n/a	n/a	n/a	
REAR YARD:	7m	7.53m	10.6m	25% LOT DPTH
INTERIOR YARD:	1m	1.22m	1.72m	
R.Y. SOFTSCAPE:	7m <sup>2</sup>	63.5m <sup>2</sup>	557m <sup>2</sup>	25% OF L. AREA
AMENITY AREA:	n/a	n/a	1	
PARKING SPACES:	0	2	1	
BIKE SPACES:	0	0	0	
M.L.C.:	NO MAX.			

BUILDING AREAS				
BASEMENT FL. GFA:	-	132.0m <sup>2</sup>	-	
FIRST FL. GFA:	-	132.0m <sup>2</sup>	-	
SECOND FL. GFA:	-	175.3m <sup>2</sup>	-	
STORAGE:	-	0.0m <sup>2</sup>	-	
GARAGE:	-	0.0m <sup>2</sup>	-	
EXITS (ALL FLOORS):	-	0.0m <sup>2</sup>	-	
TOTAL LIVING:	-	439.3m <sup>2</sup>	-	
TOTAL ALL AREAS:	-	439.3m <sup>2</sup>	-	

PROPOSED SITE DEVELOPMENT INFO				
NEW GROSS FLOOR AREA:	439.3m <sup>2</sup>	-	185.0m <sup>2</sup>	EX. DEMO'D
EX. GROSS FLOOR AREA:	0.0m <sup>2</sup>	-	2 PDUs + 2 SDUs	SINGLE
NUMBER OF UNITS:	2	-	1.5	
PROPOSED STOREYS:	2	-		
BUILDING COVERAGE:	38.4%	-		
SOFT LANDSCAPING CVG.:	35.4%	-		
HARD LANDSCAPING CVG.:	2.7%	-		
DECKS/PORCHES/STEPS:	6.4%	-		
ASPHALT CVG.:	19.8%	-		
OTHER:	0.3%	-		

SURVEY INFO:  
SURVEY INFO TAKEN FROM  
SURVEYOR'S REAL PROPERTY REPORT  
PART 1 - PLAN OF SURVEY  
PART OF LOT 22, CONCESSION 2 (OTTAWA FRONT),  
CITY OF OTTAWA  
PREPARED BY:  
STANTEC GEOMATICS LTD.  
JAN. 7, 2021

SITE NOTES  
NEW ROOF DOWN SPOUTS SHALL NOT BE DIRECTED TOWARDS THE ADJACENT PROPERTIES  
EXCAVATED MATERIAL TO BE REMOVED FROM PROPERTY  
ALL GRADE TO SLOPE 2% AWAY FROM FOUNDATION WALL  
ALL MEASUREMENTS ARE IMPERIAL AND (METRIC)  
EXISTING GRADING AND DRAINAGE PATTERNS NOT TO BE ALTERED

EXISTING PLANTING MATERIAL			
CODE	COMMON NAME	QTY.	SIZE (DIA.)
DECIDUOUS TREES			
CONIFEROUS TREES			
SHRUBS			

NEW PLANTING MATERIAL			
CODE	COMMON NAME	QTY.	SIZE (DIA.)
DECIDUOUS TREES			
DT1	RED MAPLE	2	50mm Cal.
CONIFEROUS TREES			
SHRUBS			

TREE CONSERVATION NOTES  
1. ERECT A FENCE AT THE CRITICAL ROOT ZONE (CRZ1) OF TREES;  
2. DO NOT PLACE ANY MATERIAL OR EQUIPMENT WITHIN THE CRZ OF THE TREE;  
3. DO NOT ATTACH ANY SIGNS, NOTICES OR POSTERS TO ANY TREE;  
4. DO NOT RAISE OR LOWER THE EXISTING GRADE WITHIN THE CRZ WITHOUT APPROVAL;  
5. TUNNEL OR BORE WHEN DIGGING WITHIN THE CRZ OF A TREE;  
6. DO NOT DAMAGE THE ROOT SYSTEM, TRUNK OR BRANCHES OF ANY TREE;  
7. ENSURE THAT EXHAUST FUMES FROM ALL EQUIPMENT ARE NOT DIRECTED TOWARDS ANY TREE'S CANOPY.

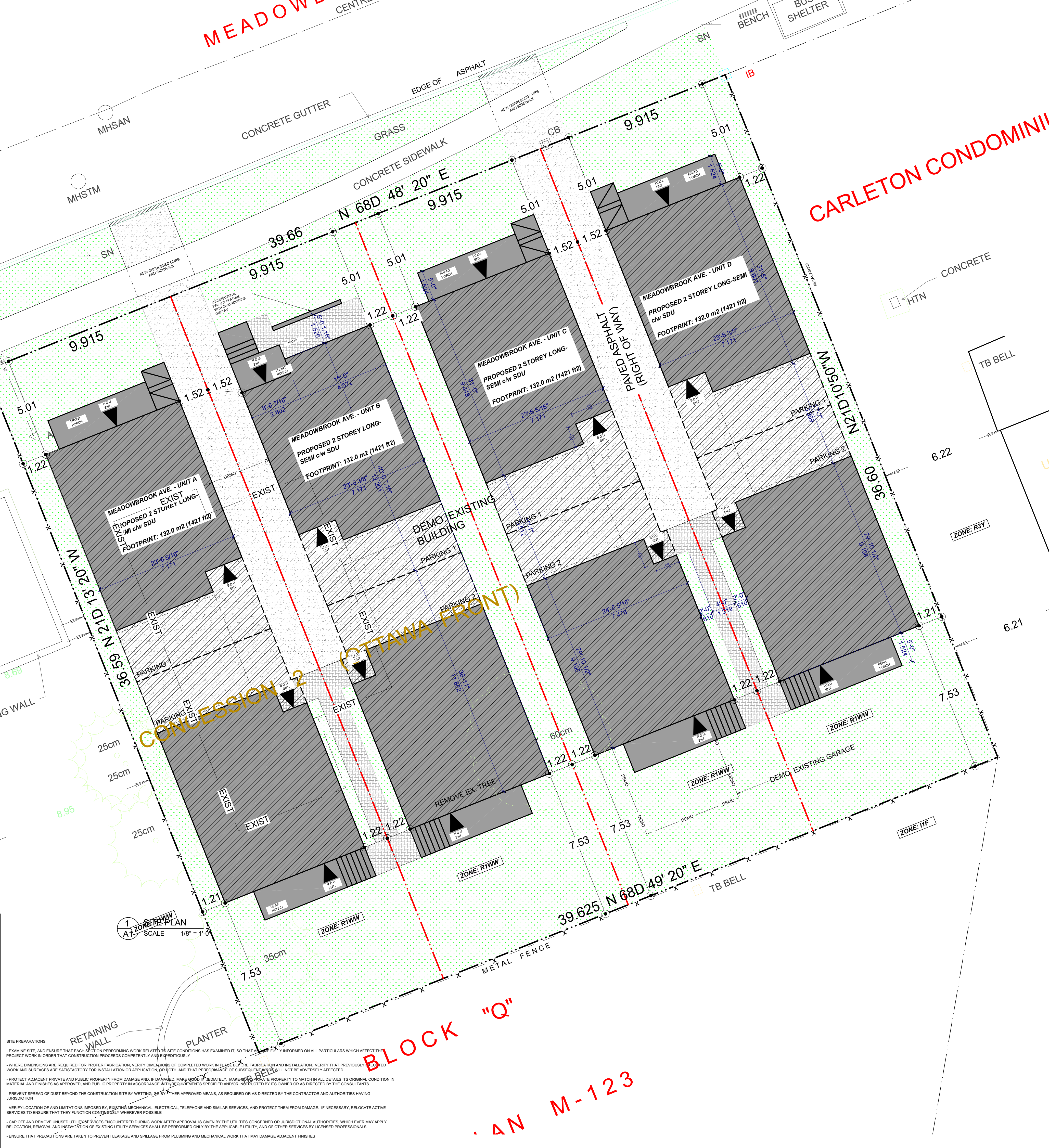
\* THE CRITICAL ROOT ZONE (CRZ) IS ESTABLISHED AS BEING 10 CENTIMETRES FROM THE TRUNK OF A TREE FOR EVERY CENTIMETRE OF TRUNK DIAMETER AT BREAST HEIGHT (DBH). THE CRZ IS CALCULATED AS DBH X 10 CM.  
\* TREE PROTECTION FENCE (PF) TO BE ERECTED BEFORE AND REMAIN UNTIL BUILDING CONSTRUCTION HAS COMPLETED AND TO CONSIST OF 1.8m HIGH PLYWOOD HOARDING (SEE DIAGRAM BELOW).

3 KEY PLAN & CONTEXT  
A1 SCALE NO SCALE



SITE LEGEND	
	EX. TREE TO BE REMOVED
	NEW CONIFEROUS TREE
	DENOTES SOFT LANDSCAPING
	DENOTES HARD LANDSCAPING
	EXISTING BUILDING FOOTPRINT
	PROPOSED HONEYCOMB HARD LANDSCAPING
	PROPOSED ASPHALT DRIVEWAY
	PROPOSED WOOD DECKS/ BALCONIES
	CAR PARKING SPACE (ASPHALT)
	BYCYCLE PARKING (ASPHALT)
	WASTE COLLECTION AREA
	SNOW STORAGE AREA
	PROPOSED/EXISTING ENTRY/EXIT
	PF - TEMPORARY PROTECTION FENCE
	EX. UTILITY POLE
	EX. CHAINED LINK/BOARD FENCE
	PROPERTY LINE

WASTE COLLECTION LEGEND	
GB	
BB	
B	
G	



AZUL DESIGNS - BCIN: 33578  
2277 PROSPECT AVE.  
OTTAWA, ON. K1H 7G2  
FERNANDO MATOS - BCIN: 22451  
613-884-4425  
QUALIFICATION INFO  
SMALL BUILDINGS  
The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to be a designer.  
RESPONSIBILITIES:  
DO NOT SCALE DRAWINGS  
ALL DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE 2006  
ALL CONTRACTORS MUST WORK IN ACCORDANCE WITH ALL LAWS, REGULATIONS AND BYLAWS HAVING JURISDICTION  
IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT/DESIGNER  
COPYRIGHT RESERVED  
GENERAL NOTES:

1568 MEADOWBROOK ROAD  
SCOPE OF WORK: NEW 2-STOREY LONG-SEMI c/w SDUs

CONSULTANTS:		
STRUCTURAL -		
MECHANICAL -		
ELECTRICAL -		
4		MDV
3		
2	REV SUBMISSION	00/00/00
1	PRELIMINARIES	08/00/01
NO.	REVISION/ISSUE	DATE
PROJECT:		
1568 MEADOWBROOK RD.		
1568 MEADOWBROOK RD.		
OTTAWA, ON. K1H 5L5		
(613) 612-3268		
DRAWING NAME:		
SITE & LANDSCAPE PLAN		
DRAWN BY:	F.M.	SHEET
DATE: JUNE 10, 2021		A1
SCALE:	AS NOTED	

FILE NUMBER: D00-00-0000



EXP Services Inc.

*Nemorin Group Limited*

*Phase Two Environmental Site Assessment*

*1568 Meadowbrook Road, Ottawa, Ontario*

*OTT-21019403-A0*

November 30, 2021

## **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 1568 Meadowbrook Road 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 to be completed by EXP in 2021. 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 (BH21-1 to BH21-3) are proposed to be advanced at the site, up to a maximum overburden depth of approximately 6.5 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  $\pm 0.5$  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 accordance 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 control 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.

EXP Services Inc.

*Nemorin Group Limited*

*Phase Two Environmental Site Assessment*

*1568 Meadowbrook Road, Ottawa, Ontario*

*OTT-21019403-A0*

November 30, 2021

## Appendix D: Borehole Logs

# Explanation of Terms Used on Borehole Records

## SOIL DESCRIPTION

Terminology describing common soil genesis:

*Topsoil:* mixture of soil and humus capable of supporting good vegetative growth.

*Peat:* fibrous fragments of visible and invisible decayed organic matter.

*Fill:* where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc.; none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

*Till:* the term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Terminology describing soil structure:

*Desiccated:* having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.

*Stratified:* alternating layers of varying material or color with the layers greater than 6 mm thick.

*Laminated:* alternating layers of varying material or color with the layers less than 6 mm thick.

*Fissured:* material breaks along plane of fracture.

*Varved:* composed of regular alternating layers of silt and clay.

*Slickensided:* fracture planes appear polished or glossy, sometimes striated.

*Blocky:* cohesive soil that can be broken down into small angular lumps which resist further breakdown.

*Lensed:* inclusion of small pockets of different soil, such as small lenses of sand scattered through a mass of clay; not thickness.

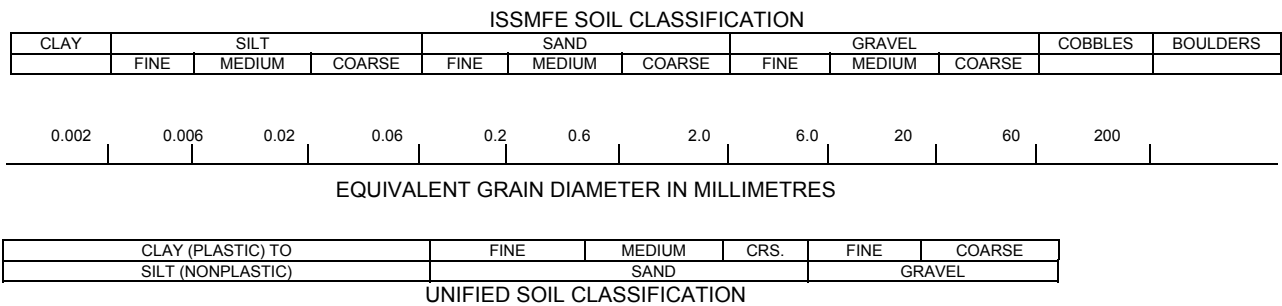
*Seam:* a thin, confined layer of soil having different particle size, texture, or color from materials above and below.

*Homogeneous:* same color and appearance throughout.

*Well Graded:* having wide range in grain sized and substantial amounts of all predominantly on grain size.

*Uniformly Graded:* predominantly on grain size.

All soil sample descriptions included in this report follow the ASTM D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). The system divides soils into three major categories: (1) coarse grained, (2) fine-grained, and (3) highly organic. The soil is then subdivided based on either gradation or plasticity characteristics. The system provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification. The classification excludes particles larger than 76 mm. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually in accordance with ASTM D2488-09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems. Others may use different classification systems; one such system is the ISSMFE Soil Classification.



Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present and as described below in accordance with Note 16 in ASTM D2488-09a:

Table a: Percent or Proportion of Soil, Pp

	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5≤Pp≤10%
Little	15≤Pp≤25%
Some	30≤Pp≤45%
Mostly	50≤Pp≤100%

The standard terminology to describe cohesionless soils includes the compactness as determined by the Standard Penetration Test 'N' value:

Table b: Apparent Density of Cohesionless Soil

	'N' Value (blows/0.3 m)
Very Loose	N<5
Loose	5≤N<10
Compact	10≤N<30
Dense	30≤N<50
Very Dense	50≤N

The standard terminology to describe cohesive soils includes consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests or similar field and laboratory analysis, Standard Penetration Test 'N' values can also be used to provide an approximate indication of the consistency and shear strength of fine grained, cohesive soils:

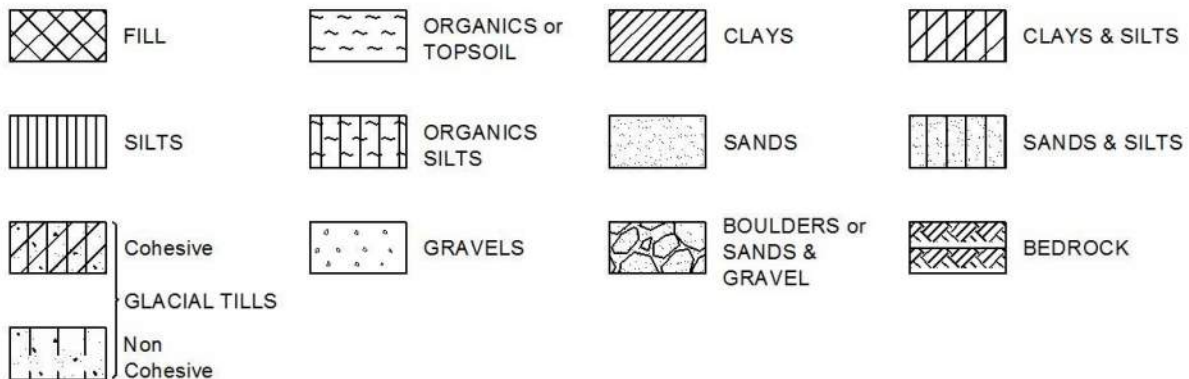
Table c: Consistency of Cohesive Soil

Consistency	Vane Shear Measurement (kPa)	'N' Value
Very Soft	<12.5	<2
Soft	12.5-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

Note: 'N' Value - The Standard Penetration Test records the number of blows of a 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler 1 foot (305mm). For split spoon samples where full penetration is not achieved, the number of blows is reported over the sampler penetration in meters (e.g. 50/0.15).

## STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:



## WATER LEVEL MEASUREMENT



# Log of Borehole BH1



Project No: OTT-21019403-A0

Project: Proposed Residential Development

Location: 1568 Meadowbrook Road, Ottawa, Ontario

Figure No. 3

Page. 1 of 1

Date Drilled: October 27, 2021

Drill Type: CME-55 Truck Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: SMP

Split Spoon Sample ☒

Auger Sample ☐

SPT (N) Value ☐

Dynamic Cone Test ☐

Shelby Tube ☐

Shear Strength by  
Vane Test ☐

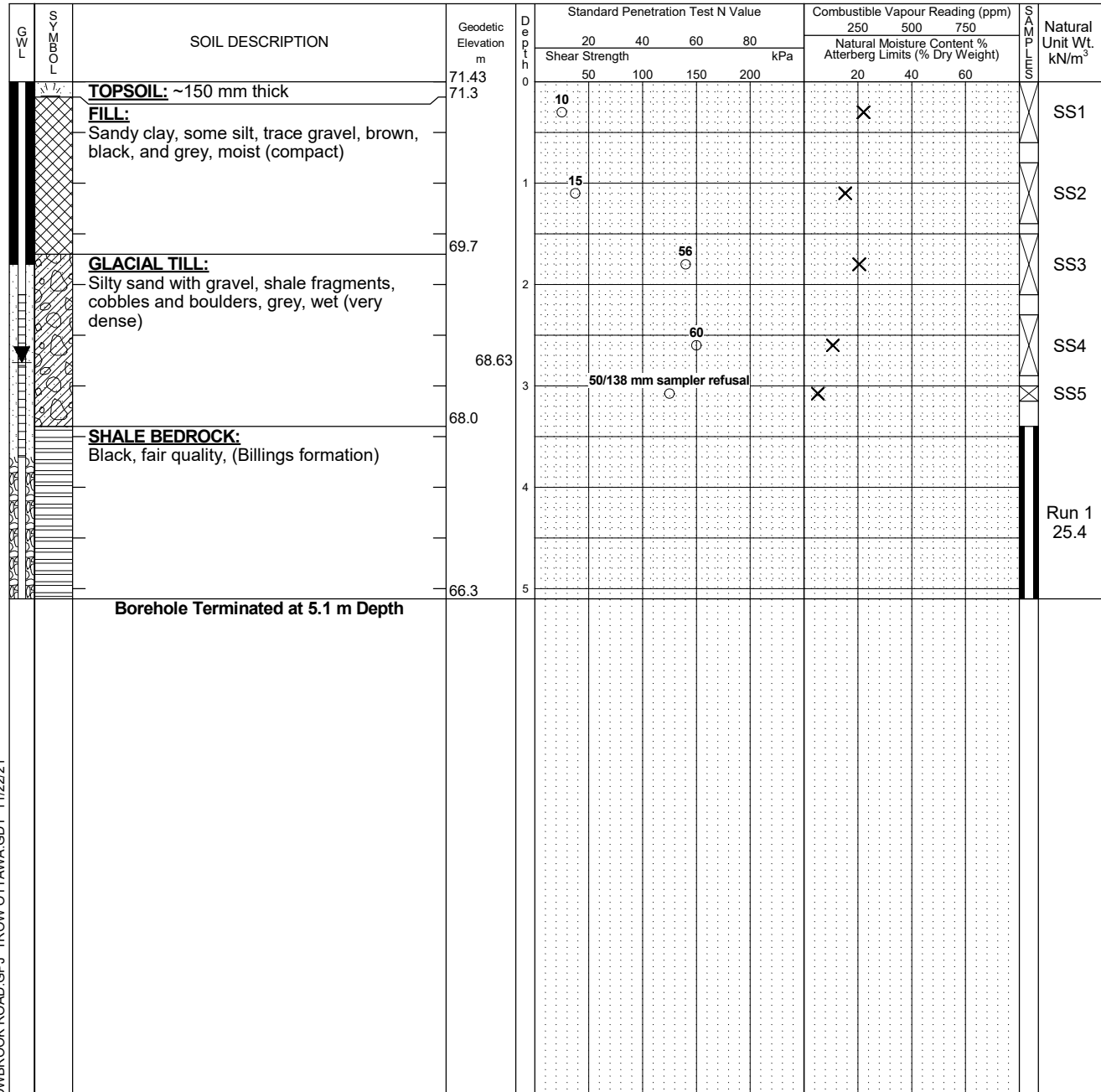
Combustible Vapour Reading ☐

Natural Moisture Content ☒

Atterberg Limits ☐

Undrained Triaxial at  
% Strain at Failure ☐

Shear Strength by  
Penetrometer Test ☐



## NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Fieldwork was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019403-A0

## WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov 10, 2021	2.8	

## CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	3.4 - 5.1	100	67

LOG OF BOREHOLE 1568 MEADOWBROOK ROAD.GPJ TROW OTTAWA.GDT 11/22/21



# Log of Borehole BH2



Project No: OTT-21019403-A0

Project: Proposed Residential Development

Location: 1568 Meadowbrook Road, Ottawa, Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: October 27, 2021

Drill Type: CME-55 Truck Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: SMP

Split Spoon Sample ☒

Auger Sample ☒

SPT (N) Value ☐

Dynamic Cone Test ☐

Shelby Tube ☐

Shear Strength by  
Vane Test ☐

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLES	Natural Unit Wt. kN/m³	
									250	500	750			
					Shear Strength kPa				Natural Moisture Content % Atterberg Limits (% Dry Weight)					
					20	40	60	80	20	40	60			
		<b>TOPSOIL:</b> ~100 mm thick	71.38	0	7 ○							X		SS1
		<b>FILL:</b> Sandy clay of low to medium plasticity, topsoil inclusions, brown, moist (loose to compact)		1	12 ○							I X ○		SS2 20.8
			69.7											
		<b>GLACIAL TILL:</b> Silty sand with gravel, shale fragments, cobbles and boulders, grey, damp (dense to very dense)	69.18	2		40 ○					X			SS3 22.0
						52 ○					X			SS4
				3										
											X			SS5
			67.8											
		<b>Auger Refusal at 3.6 m Depth</b>												

## NOTES:

- Borehole data requires interpretation by EXP before use by others
- A 19 mm diameter standpipe installed as shown.
- Fieldwork was supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-21019403-A0

## WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov 10, 2021	2.2	

## CORE DRILLING RECORD

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

LOG OF BOREHOLE 1568 MEADOWBROOK ROAD.GPJ TROW OTTAWA.GDT 11/22/21

# Log of Borehole BH3



Project No: OTT-21019403-A0

Project: Proposed Residential Development

Location: 1568 Meadowbrook Road, Ottawa, Ontario

Figure No. 5

Page. 1 of 1

Date Drilled: October 27, 2021

Drill Type: CME-55 Truck Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: SMP

Split Spoon Sample ☒

Auger Sample ☒

SPT (N) Value ☐

Dynamic Cone Test ☐

Shelby Tube ☐

Shear Strength by  
Vane Test ☐

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLES	Natural Unit Wt. kN/m³		
					20 40 60 80				250 500 750						
					Shear Strength kPa				Natural Moisture Content % Atterberg Limits (% Dry Weight)						
					50	100	150	200		20	40	60			
		<b>TOPSOIL:</b> ~150 mm thick	71.49	0	6										SS1
		<b>FILL:</b> Sandy clay, some silt, trace gravel, topsoil inclusions, brown, moist (loose)	71.3									X			
		<b>GLACIAL TILL:</b> Silty sand with gravel, shale fragments, cobbles and boulders, grey, damp (very dense)	70.6	1	16						X				SS2 20.7
			70.49												
				2			70			X					SS3 22.2
			68.8												
		<b>CLAY</b> With sand, low to medium plasticity, grey, damp, (hard)	68.5	3		44				X					SS4
		<b>GLACIAL TILL:</b> Silty sand with gravel, shale fragments, cobbles and boulders, grey, damp (very dense)	67.9												SS5
		<b>Auger Refusal at 3.6 m Depth</b>													

## NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Fieldwork was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21019403-A0

## WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov 10, 2021	1.0	

## CORE DRILLING RECORD

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

LOG OF BOREHOLE 1568 MEADOWBROOK ROAD.GPJ TROW OTTAWA.GDT 11/22/21

EXP Services Inc.

*Nemorin Group Limited*

*Phase Two Environmental Site Assessment*

*1568 Meadowbrook Road, Ottawa, Ontario*

*OTT-21019403-A0*

November 30, 2021

## Appendix E: Analytical Summary Tables

**TABLE 1 SOIL ANALYTICAL RESULTS ( $\mu\text{g/g}$ )**  
**PETROLEUM HYDROCARBONS**  
**1568 Meadowbrook Road, Ottawa, Ontario**

Parameter	MECP Table 3 <sup>1</sup>	BH-1 SS2	DUP1	BH-2 SS1	BH-3 SS1
Sample Date (d/m/y)	<b>Residential</b>	27/10/2021	Duplicate of	27/10/2021	27/10/2021
Sample Depth (mbsg)		0.75 - 1.2	BH-1 SS2	0.0 - 0.75	0.0 - 0.75
Benzene	0.21	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	2	<0.020	<0.020	<0.020	<0.020
Toluene	2.3	<0.020	<0.020	0.042	<0.020
Xylenes	3.1	<0.040	<0.040	<0.040	<0.040
PHC F <sub>1</sub> (>C <sub>6</sub> -C <sub>10</sub> )	55	<10	<10	<10	<10
PHC F <sub>2</sub> (>C <sub>10</sub> -C <sub>16</sub> )	98	<10	<10	<10	<10
PHC F <sub>3</sub> (>C <sub>16</sub> -C <sub>34</sub> )	300	<50	<50	<50	<50
PHC F <sub>4</sub> (>C <sub>34</sub> -C <sub>50</sub> )	2800	<50	<50	<50	<50

**NOTES:**

<sup>1</sup> MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards.

**Shaded/Bold** Concentration exceeds MECP Table 3 soil quality standard.

**TABLE 2 SOIL ANALYTICAL RESULTS ( $\mu\text{g/g}$ )  
METALS  
1568 Meadowbrook Road, Ottawa, Ontario**

Parameter	MECP Table 3 <sup>1</sup>	BH-1 SS2	DUP1	BH-2 SS1	BH-3 SS1
Sample Date (d/m/y)	<b>Residential</b>	27/10/2021	Duplicate of	27/10/2021	27/10/2021
Sample Depth (mbgs)		0.75 - 1.2	BH-1 SS2	0.0 - 0.75	0.0 - 0.75
Antimony	7.5	<0.20	<0.20	<0.20	<0.20
Arsenic	18	2.3	2.7	7.3	3.4
Barium	390	96	100	100	100
Beryllium	4	0.63	0.64	0.48	0.41
Boron	120	6.5	6.4	<5.0	<5.0
Cadmium	1.2	0.11	<0.10	0.21	0.12
Chromium	160	27	28	26	26
Cobalt	22	10	9.9	7.5	6.1
Copper	140	22	24	14	14
Lead	120	7.5	7.0	19	38
Molybdenum	6.9	0.83	0.91	1.0	0.80
Nickel	100	22	22	19	16
Selenium	2.4	<0.50	<0.50	<0.50	<0.50
Silver	20	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.19	0.19	0.15	0.11
Uranium	23	0.72	0.65	0.85	0.92
Vanadium	86	37	38	30	28
Zinc	340	40	43	51	50

**NOTES:**

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards.

**Shaded/ Bold** Concentration exceeds MECP Table 3 soil quality standard.

NA Not analyzed

**TABLE 3 SOIL ANALYTICAL RESULTS ( $\mu\text{g/g}$ )**  
**POLYCYCLIC AROMATIC HYDROCARBONS**  
**1568 Meadowbrook Road, Ottawa, Ontario**

Parameter	MECP Table 3 <sup>1</sup>	BH-1 SS2	DUP1	BH-2 SS1	BH-3 SS1
Sample Date (d/m/y)	<b>Residential</b>	27/10/2021	Duplicate of	27/10/2021	27/10/2021
Sample Depth (mbsg)		0.75 - 1.2	BH-1 SS2	0.0 - 0.75	0.0 - 0.75
Acenaphthene	7.9	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	0.15	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	0.67	<0.0050	<0.0050	<0.0050	0.0058
Benzo[a]anthracene	0.5	<0.0050	<0.0050	0.0072	0.016
Benzo[a]pyrene	0.3	<0.0050	<0.0050	0.0090	0.016
Benzo[b]fluoranthene	0.78	<0.0050	<0.0050	0.016	0.026
Benzo[g,h,i]perylene	6.6	<0.0050	<0.0050	0.0083	0.012
Benzo[k]fluoranthene	0.78	<0.0050	<0.0050	<0.0050	0.0084
Chrysene	7	<0.0050	<0.0050	0.0094	0.017
Dibenz[a,h]anthracene	0.1	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	0.69	<0.0050	<0.0050	0.018	0.037
Fluorene	62	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	0.38	<0.0050	<0.0050	0.0084	0.013
Methylnaphthalene, 2-(1-)	0.99	<0.0071	<0.0071	<0.0071	0.013
Naphthalene	0.6	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	6.2	<0.0050	<0.0050	0.010	0.027
Pyrene	78	<0.0050	<0.0050	0.015	0.033

**NOTES:**

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards.

**Shaded/ Bold** Concentration exceeds MECP Table 3 soil quality standard.

**Table 4 - Maximum Concentrations in Soil**  
**1568 Meadowbrook Road, Ottawa, Ontario**  
**OTT-21019403-A0**

Page 1 of 2

Parameter	Sample Location	Sample Depth (mbgs)	Sampling Date	Maximum Concentration	MECP Table 3
<b>Petroleum Hydrocarbons</b>					
F1 PHC (C6 - C10) - BTEX	All Locations	0.0 - 0.75	27-Oct-21	<10	55
F2 PHC (C10-C16)	All Locations	0.0 - 0.75	27-Oct-21	<10	98
F3 PHC (C16-C34)	All Locations	0.0 - 0.75	27-Oct-21	<50	300
F4 PHC (C34-C50)	All Locations	0.0 - 0.75	27-Oct-21	<50	2800
Benzene	All Locations	0.0 - 0.75	27-Oct-21	<0.020	0.21
Ethylbenzene	All Locations	0.0 - 0.75	27-Oct-21	<0.020	2
Toluene	BH-2 SS1	0.0 - 0.75	27-Oct-21	0.042	2.3
Xylenes	All Locations	0.0 - 0.75	27-Oct-21	<0.040	3.1
<b>Polycyclic Aromatic Hydrocarbons</b>					
Acenaphthene	All Locations	0.0 - 0.75	27-Oct-21	<0.0050	7.9
Acenaphthylene	All Locations	0.0 - 0.75	27-Oct-21	<0.0050	0.15
Anthracene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.058	0.67
Benzo(a)anthracene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.016	0.5
Benzo(a)pyrene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.016	0.3
Benzo(b)fluoranthene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.026	0.78
Benzo(g,h,i)perylene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.012	6.6
Benzo(k)fluoranthene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.0084	0.78
Chrysene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.017	7
Dibenz(a,h)anthracene	All Locations	0.0 - 0.75	27-Oct-21	<0.0050	0.1
Fluoranthene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.037	0.69
Fluorene	All Locations	0.0 - 0.75	27-Oct-21	<0.0050	62
Indeno(1,2,3-cd)pyrene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.013	0.38
Methylnaphthalene, 2-(1-)	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.013	0.99
Naphthalene	All Locations	0.0 - 0.75	27-Oct-21	<0.0050	0.6
Phenanthrene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.027	6.2
Pyrene	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.033	78
<b>Inorganic Parameters</b>					
Antimony	All Locations	0.0 - 0.75	27-Oct-21	<0.20	7.5
Arsenic	BH-2 SS1	0.0 - 0.75	27-Oct-21	7.3	18
Barium	BH-2 SS1	0.0 - 0.75	27-Oct-21	100	390
Beryllium	DUP1	0.0 - 0.75	27-Oct-21	0.64	4
Boron	BH-1 SS2	0.0 - 0.75	27-Oct-21	6.5	120
Cadmium	BH-2 SS1	0.75 - 1.2	27-Oct-21	0.21	1.2
Chromium	DUP1	0.0 - 0.75	27-Oct-21	28	160
Cobalt	BH-1 SS2	0.0 - 0.75	27-Oct-21	10	22
Copper	DUP1	0.0 - 0.75	27-Oct-21	24	140
Lead	BH-3 SS1	0.0 - 0.75	27-Oct-21	38	120
Molybdenum	BH-2 SS1	0.75 - 1.2	27-Oct-21	1	6.9
Nickel	DUP1	0.0 - 0.75	27-Oct-21	22	100
Selenium	All Locations	0.0 - 0.75	27-Oct-21	<0.50	2.4
Silver	All Locations	0.0 - 0.75	27-Oct-21	<0.20	20
Thallium	DUP1	0.0 - 0.75	27-Oct-21	0.19	1
Uranium	BH-3 SS1	0.0 - 0.75	27-Oct-21	0.92	23
Vanadium	DUP1	0.0 - 0.75	27-Oct-21	38	86
Zinc	BH-2 SS1	0.0 - 0.75	27-Oct-21	51	340

**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 3 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 RELATIVE PERCENT DIFFERENCES  
PETROLEUM HYDROCARBONS - SOIL  
1568 Meadowbrook Road, Ottawa, Ontario**

Page 1 of 1

Parameter	Units	RDL	BH-1 SS2	DUP1	RPD (%)	Alert Limit (%)
			27-Oct-21			
Petroleum Hydrocarbons						
PHC F <sub>1</sub> (>C <sub>6</sub> -C <sub>10</sub> )	ug/g	10	<10	<10	nc	60
PHC F <sub>2</sub> (>C <sub>10</sub> -C <sub>16</sub> )	ug/g	10	<10	<10	nc	60
PHC F <sub>3</sub> (>C <sub>16</sub> -C <sub>34</sub> )	ug/g	50	<50	<50	nc	60
PHC F <sub>4</sub> (>C <sub>34</sub> -C <sub>50</sub> )	ug/g	50	<50	<50	nc	60
Volatiles						
Benzene	ug/g	0.020	<0.020	<0.020	nc	100
Ethylbenzene	ug/g	0.020	<0.020	<0.020	nc	100
Toluene	ug/g	0.020	<0.020	<0.020	nc	100
Total Xylenes	ug/q	0.020	<0.040	<0.040	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 6 RELATIVE PERCENT DIFFERENCES  
METALS - SOIL  
1568 Meadowbrook Road, Ottawa, Ontario**

Page 1 of 1

Parameter	Units	RDL	BH-1 SS2	DUP1	RPD (%)	Alert Limit (%)
			27-Oct-21			
Inorganic Parameters						
Antimony	ug/g	0.20	<0.20	<0.20	nc	60
Arsenic	ug/g	1.0	2.3	2.7	nc	60
Barium	ug/g	0.50	96	100	4	60
Beryllium	ug/g	0.20	0.63	0.64	nc	NC
Boron	ug/g	5.0	6.5	6.4	nc	60
Cadmium	ug/g	0.10	0.11	<0.10	nc	60
Chromium	ug/g	1.0	27	28	4	60
Cobalt	ug/g	0.10	10	9.9	1	60
Copper	ug/g	0.50	22	24	9	60
Lead	ug/g	1.0	7.5	7.0	7	60
Molybdenum	ug/g	0.50	0.83	0.91	nc	60
Nickel	ug/g	0.50	22	22	0	60
Selenium	ug/g	0.50	<0.50	<0.50	nc	60
Silver	ug/g	0.20	<0.20	<0.20	nc	60
Thallium	ug/g	0.050	0.19	0.19	nc	60
Vanadium	ug/g	0.050	0.72	0.65	10	60
Uranium	ug/g	5.0	37	38	3	60
Zinc	ug/g	5.0	40	43	7	60

**NOTES:**

Analysis by Maxxam Analytics/BVL

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

- means "not analysed"

nc means "not calculable" - one (or both) of the results are &lt;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 7 RELATIVE PERCENT DIFFERENCES  
POLYCYCLIC AROMATIC HYDROCARBONS - SOIL  
1568 Meadowbrook Road, Ottawa, Ontario**

Page 1 of 1

Parameter	Units	RDL	BH-1 SS2	DUP1	RPD (%)	Alert Limit (%)
			27-Oct-21			
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	ug/g	0.01	<0.0050	<0.0050	nc	80
Acenaphthylene	ug/g	0.01	<0.0050	<0.0050	nc	80
Anthracene	ug/g	0.01	<0.0050	<0.0050	nc	80
Benzo(a)anthracene	ug/g	0.01	<0.0050	<0.0050	nc	80
Benzo(a)pyrene	ug/g	0.01	<0.0050	<0.0050	nc	80
Benzo(b/j)fluoranthene	ug/g	0.01	<0.0050	<0.0050	nc	80
Benzo(ghi)perylene	ug/g	0.01	<0.0050	<0.0050	nc	80
Benzo(k)fluoranthene	ug/g	0.01	<0.0050	<0.0050	nc	80
Chrysene	ug/g	0.01	<0.0050	<0.0050	nc	80
Dibenz(a,h)anthracene	ug/g	0.01	<0.0050	<0.0050	nc	80
Fluoranthene	ug/g	0.01	<0.0050	<0.0050	nc	80
Fluorene	ug/g	0.01	<0.0050	<0.0050	nc	80
Indeno(1,2,3-cd)pyrene	ug/g	0.01	<0.0050	<0.0050	nc	80
Methylnaphthalene, 2-(1-)	ug/g	0.014	<0.0071	<0.0071	nc	80
Naphthalene	ug/g	0.01	<0.0050	<0.0050	nc	80
Phenanthrene	ug/g	0.01	<0.0050	<0.0050	nc	80
Pyrene	ug/g	0.01	<0.0050	<0.0050	nc	80

**NOTES:**

Analysis by Maxxam Analytics/BVL

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

- means "not analysed"

nc means "not calculable" - one (or both) of the results are &lt;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 1 SOIL ANALYTICAL RESULTS ( $\mu\text{g/g}$ )**  
**PETROLEUM HYDROCARBONS**  
**1568 Meadowbrook Road, Ottawa, Ontario**

Parameter	MECP Table 3 <sup>1</sup>	BH-1 SS2	DUP1	BH-2 SS1	BH-3 SS1
Sample Date (d/m/y)	<b>Residential</b>	27/10/2021	Duplicate of	27/10/2021	27/10/2021
Sample Depth (mbsg)		0.75 - 1.2	BH-1 SS2	0.0 - 0.75	0.0 - 0.75
Benzene	0.21	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	2	<0.020	<0.020	<0.020	<0.020
Toluene	2.3	<0.020	<0.020	0.042	<0.020
Xylenes	3.1	<0.040	<0.040	<0.040	<0.040
PHC F <sub>1</sub> (>C <sub>6</sub> -C <sub>10</sub> )	55	<10	<10	<10	<10
PHC F <sub>2</sub> (>C <sub>10</sub> -C <sub>16</sub> )	98	<10	<10	<10	<10
PHC F <sub>3</sub> (>C <sub>16</sub> -C <sub>34</sub> )	300	<50	<50	<50	<50
PHC F <sub>4</sub> (>C <sub>34</sub> -C <sub>50</sub> )	2800	<50	<50	<50	<50

**NOTES:**

<sup>1</sup> MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards.

**Shaded/Bold** Concentration exceeds MECP Table 3 soil quality standard.

**TABLE 2 SOIL ANALYTICAL RESULTS ( $\mu\text{g/g}$ )  
METALS  
1568 Meadowbrook Road, Ottawa, Ontario**

Parameter	MECP Table 3 <sup>1</sup>	BH-1 SS2	DUP1	BH-2 SS1	BH-3 SS1
Sample Date (d/m/y)	<b>Residential</b>	27/10/2021	Duplicate of	27/10/2021	27/10/2021
Sample Depth (mbgs)		0.75 - 1.2	BH-1 SS2	0.0 - 0.75	0.0 - 0.75
Antimony	7.5	<0.20	<0.20	<0.20	<0.20
Arsenic	18	2.3	2.7	7.3	3.4
Barium	390	96	100	100	100
Beryllium	4	0.63	0.64	0.48	0.41
Boron	120	6.5	6.4	<5.0	<5.0
Cadmium	1.2	0.11	<0.10	0.21	0.12
Chromium	160	27	28	26	26
Cobalt	22	10	9.9	7.5	6.1
Copper	140	22	24	14	14
Lead	120	7.5	7.0	19	38
Molybdenum	6.9	0.83	0.91	1.0	0.80
Nickel	100	22	22	19	16
Selenium	2.4	<0.50	<0.50	<0.50	<0.50
Silver	20	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.19	0.19	0.15	0.11
Uranium	23	0.72	0.65	0.85	0.92
Vanadium	86	37	38	30	28
Zinc	340	40	43	51	50

**NOTES:**

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards.

**Shaded/ Bold** Concentration exceeds MECP Table 3 soil quality standard.

NA Not analyzed

**TABLE 3 SOIL ANALYTICAL RESULTS ( $\mu\text{g/g}$ )**  
**POLYCYCLIC AROMATIC HYDROCARBONS**  
**1568 Meadowbrook Road, Ottawa, Ontario**

Parameter	MECP Table 3 <sup>1</sup>	BH-1 SS2	DUP1	BH-2 SS1	BH-3 SS1
Sample Date (d/m/y)	<b>Residential</b>	27/10/2021	Duplicate of	27/10/2021	27/10/2021
Sample Depth (mbsg)		0.75 - 1.2	BH-1 SS2	0.0 - 0.75	0.0 - 0.75
Acenaphthene	7.9	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	0.15	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	0.67	<0.0050	<0.0050	<0.0050	0.0058
Benzo[a]anthracene	0.5	<0.0050	<0.0050	0.0072	0.016
Benzo[a]pyrene	0.3	<0.0050	<0.0050	0.0090	0.016
Benzo[b]fluoranthene	0.78	<0.0050	<0.0050	0.016	0.026
Benzo[g,h,i]perylene	6.6	<0.0050	<0.0050	0.0083	0.012
Benzo[k]fluoranthene	0.78	<0.0050	<0.0050	<0.0050	0.0084
Chrysene	7	<0.0050	<0.0050	0.0094	0.017
Dibenz[a,h]anthracene	0.1	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	0.69	<0.0050	<0.0050	0.018	0.037
Fluorene	62	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	0.38	<0.0050	<0.0050	0.0084	0.013
Methylnaphthalene, 2-(1-)	0.99	<0.0071	<0.0071	<0.0071	0.013
Naphthalene	0.6	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	6.2	<0.0050	<0.0050	0.010	0.027
Pyrene	78	<0.0050	<0.0050	0.015	0.033

**NOTES:**

1 MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the EPA, April 2011, Table 3 non-potable residential standards.

**Shaded/ Bold** Concentration exceeds MECP Table 3 soil quality standard.

EXP Services Inc.

*Nemorin Group Limited*

*Phase Two Environmental Site Assessment*

*1568 Meadowbrook Road, Ottawa, Ontario*

*OTT-21019403-A0*

November 30, 2021

## Appendix F: Laboratory Certificates of Analysis



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

**ATTENTION TO: matthew Zammit**

**PROJECT: OTT-21019403-AO**

**AGAT WORK ORDER: 21Z823524**

**SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager**

**DATE REPORTED: Nov 04, 2021**

**PAGES (INCLUDING COVER): 6**

**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.



## Certificate of Analysis

AGAT WORK ORDER: 21Z823524

PROJECT: OTT-21019403-AO

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

SAMPLING SITE: 1568 Meadowbrook Dr., Ottawa

ATTENTION TO: matthew Zammit

SAMPLED BY:

### Chloride and Sulphate in %

DATE RECEIVED: 2021-10-29

DATE REPORTED: 2021-11-04

		SAMPLE DESCRIPTION:		BH2 SS4 7.
		SAMPLE TYPE:		5'-9.5'
		DATE SAMPLED:		Soil
				2021-10-27
Parameter	Unit	G / S	RDL	3148780
Chloride (2:1)	%		0.0002	0.0003
Sulphate (2:1)	%		0.0002	0.0151

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

3148780 Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil).

Analysis performed at AGAT Toronto (unless marked by \*)

**Certified By:**





# Certificate of Analysis

AGAT WORK ORDER: 21Z823524

PROJECT: OTT-21019403-AO

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

SAMPLING SITE: 1568 Meadowbrook Dr., Ottawa

ATTENTION TO: matthew Zammit

SAMPLED BY:

## Inorganic Chemistry (Soil)

DATE RECEIVED: 2021-10-29

DATE REPORTED: 2021-11-04

		SAMPLE DESCRIPTION: BH2 SS4 7.		
		5'-9.5'		
		SAMPLE TYPE: Soil		
		DATE SAMPLED: 2021-10-27		
Parameter	Unit	G / S	RDL	3148780
Chloride (2:1)	µg/g		2	3
Sulphate (2:1)	µg/g		2	151
pH (2:1)	pH Units		NA	8.46
Electrical Conductivity (2:1)	mS/cm		0.005	0.275
Resistivity (2:1) (Calculated)	ohm.cm		1	3640

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

**3148780** 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:**



## Quality Assurance

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 21Z823524

PROJECT: OTT-21019403-AO

ATTENTION TO: matthew Zammit

SAMPLING SITE: 1568 Meadowbrook Dr., Ottawa

SAMPLED BY:

### Soil Analysis

RPT Date: Nov 04, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

#### Inorganic Chemistry (Soil)

Chloride (2:1)	3152963		10	11	9.5%	< 2	95%	70%	130%	102%	80%	120%	101%	70%	130%
Sulphate (2:1)	3152963		13	13	0.0%	< 2	97%	70%	130%	101%	80%	120%	100%	70%	130%
pH (2:1)	3152963	3152963	8.56	8.58	0.2%	NA	98%	80%	120%						
Electrical Conductivity (2:1)	3148780	3148780	0.275	0.285	3.6%	< 0.005	99%	80%	120%	NA			NA		

Comments: NA signifies Not Applicable.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

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

#### Chloride and Sulphate in %

Chloride (2:1)	3152963		0.0010	0.0011	9.5%	< 0.0002	95%	70%	130%	102%	80%	120%	101%	70%	130%
Sulphate (2:1)	3152963		0.0013	0.0013	0.0%	< 0.0002	97%	70%	130%	101%	80%	120%	100%	70%	130%

Comments: NA signifies Not Applicable.

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

### Certified By:




## Method Summary

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 21Z823524

PROJECT: OTT-21019403-AO

ATTENTION TO: matthew Zammit

SAMPLING SITE: 1568 Meadowbrook Dr., Ottawa

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Soil Analysis</b>			
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
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B, SSA #5 Part 3	CALCULATION







Your Project #: OTT-21019403-A0  
Your C.O.C. #: n/a

**Attention: Mark McCalla**

exp Services Inc  
Ottawa Branch  
100-2650 Queensview Drive  
Ottawa, ON  
CANADA K2B 8H6

**Report Date: 2021/11/08**  
Report #: R6892326  
Version: 2 - Revision

**CERTIFICATE OF ANALYSIS – REVISED REPORT**

**BV LABS JOB #: C1V5753**

**Received: 2021/10/27, 16:11**

Sample Matrix: Soil  
# Samples Received: 4

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
Methylnaphthalene Sum (1)	4	N/A	2021/11/01	CAM SOP-00301	EPA 8270D m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 2)	4	N/A	2021/11/07	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	4	2021/11/05	2021/11/06	CAM SOP-00316	CCME CWS m
Acid Extractable Metals by ICPMS (1)	2	2021/10/29	2021/11/02	CAM SOP-00447	EPA 6020B m
Acid Extractable Metals by ICPMS (1)	1	2021/10/30	2021/11/02	CAM SOP-00447	EPA 6020B m
Acid Extractable Metals by ICPMS (1)	1	2021/10/30	2021/11/03	CAM SOP-00447	EPA 6020B m
Moisture (1)	4	N/A	2021/10/28	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	4	2021/10/29	2021/10/30	CAM SOP-00318	EPA 8270D m

**Remarks:**

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd, Mississauga, ON, L5N 2L8

(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.

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



Your Project #: OTT-21019403-A0  
Your C.O.C. #: n/a

**Attention: Mark McCalla**

exp Services Inc  
Ottawa Branch  
100-2650 Queensview Drive  
Ottawa, ON  
CANADA K2B 8H6

**Report Date: 2021/11/08**  
Report #: R6892326  
Version: 2 - Revision

**CERTIFICATE OF ANALYSIS – REVISED REPORT**

**BV LABS JOB #: C1V5753**

**Received: 2021/10/27, 16:11**

elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Katherine Szozda, Project Manager

Email: Katherine.Szozda@bureauveritas.com

Phone# (613)274-0573 Ext:7063633

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



BUREAU  
VERITAS

Bureau Veritas Job #: C1V5753

Report Date: 2021/11/08

exp Services Inc

Client Project #: OTT-21019403-A0

Sampler Initials: MM

### O.REG 153 ICPMS METALS (SOIL)

Bureau Veritas ID		RBM728		RBM729	RBM730		RBM731		
Sampling Date		2021/10/27		2021/10/27	2021/10/27		2021/10/27		
COC Number		n/a		n/a	n/a		n/a		
	<b>UNITS</b>	<b>BH1 SS2</b>	<b>QC Batch</b>	<b>BH2 SS1</b>	<b>BH3 SS1</b>	<b>QC Batch</b>	<b>DUP 1</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Metals</b>									
Acid Extractable Antimony (Sb)	ug/g	<0.20	7671112	<0.20	<0.20	7669595	<0.20	0.20	7671234
Acid Extractable Arsenic (As)	ug/g	2.3	7671112	7.3	3.4	7669595	2.7	1.0	7671234
Acid Extractable Barium (Ba)	ug/g	96	7671112	100	100	7669595	100	0.50	7671234
Acid Extractable Beryllium (Be)	ug/g	0.63	7671112	0.48	0.41	7669595	0.64	0.20	7671234
Acid Extractable Boron (B)	ug/g	6.5	7671112	<5.0	<5.0	7669595	6.4	5.0	7671234
Acid Extractable Cadmium (Cd)	ug/g	0.11	7671112	0.21	0.12	7669595	<0.10	0.10	7671234
Acid Extractable Chromium (Cr)	ug/g	27	7671112	26	26	7669595	28	1.0	7671234
Acid Extractable Cobalt (Co)	ug/g	10	7671112	7.5	6.1	7669595	9.9	0.10	7671234
Acid Extractable Copper (Cu)	ug/g	22	7671112	14	14	7669595	24	0.50	7671234
Acid Extractable Lead (Pb)	ug/g	7.5	7671112	19	38	7669595	7.0	1.0	7671234
Acid Extractable Molybdenum (Mo)	ug/g	0.83	7671112	1.0	0.80	7669595	0.91	0.50	7671234
Acid Extractable Nickel (Ni)	ug/g	22	7671112	19	16	7669595	22	0.50	7671234
Acid Extractable Selenium (Se)	ug/g	<0.50	7671112	<0.50	<0.50	7669595	<0.50	0.50	7671234
Acid Extractable Silver (Ag)	ug/g	<0.20	7671112	<0.20	<0.20	7669595	<0.20	0.20	7671234
Acid Extractable Thallium (Tl)	ug/g	0.19	7671112	0.15	0.11	7669595	0.19	0.050	7671234
Acid Extractable Uranium (U)	ug/g	0.72	7671112	0.85	0.92	7669595	0.65	0.050	7671234
Acid Extractable Vanadium (V)	ug/g	37	7671112	30	28	7669595	38	5.0	7671234
Acid Extractable Zinc (Zn)	ug/g	40	7671112	51	50	7669595	43	5.0	7671234
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



### O.REG 153 PAHS (SOIL)

Bureau Veritas ID		RBM728	RBM729	RBM730	RBM731		
Sampling Date		2021/10/27	2021/10/27	2021/10/27	2021/10/27		
COC Number		n/a	n/a	n/a	n/a		
	<b>UNITS</b>	<b>BH1 SS2</b>	<b>BH2 SS1</b>	<b>BH3 SS1</b>	<b>DUP 1</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Inorganics</b>							
Moisture	%	14	26	20	15	1.0	7666998
<b>Calculated Parameters</b>							
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	0.013	<0.0071	0.0071	7666587
<b>Polyaromatic Hydrocarbons</b>							
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7669465
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7669465
Anthracene	ug/g	<0.0050	<0.0050	0.0058	<0.0050	0.0050	7669465
Benzo(a)anthracene	ug/g	<0.0050	0.0072	0.016	<0.0050	0.0050	7669465
Benzo(a)pyrene	ug/g	<0.0050	0.0090	0.016	<0.0050	0.0050	7669465
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.016	0.026	<0.0050	0.0050	7669465
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0083	0.012	<0.0050	0.0050	7669465
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	0.0084	<0.0050	0.0050	7669465
Chrysene	ug/g	<0.0050	0.0094	0.017	<0.0050	0.0050	7669465
Dibenzo(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7669465
Fluoranthene	ug/g	<0.0050	0.018	0.037	<0.0050	0.0050	7669465
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7669465
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0084	0.013	<0.0050	0.0050	7669465
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0063	<0.0050	0.0050	7669465
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	0.0068	<0.0050	0.0050	7669465
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7669465
Phenanthrene	ug/g	<0.0050	0.010	0.027	<0.0050	0.0050	7669465
Pyrene	ug/g	<0.0050	0.015	0.033	<0.0050	0.0050	7669465
<b>Surrogate Recovery (%)</b>							
D10-Anthracene	%	94	97	91	98		7669465
D14-Terphenyl (FS)	%	91	95	91	94		7669465
D8-Acenaphthylene	%	88	91	85	90		7669465
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



**O.REG 153 PHCS, BTEX/F1-F4 (SOIL)**

Bureau Veritas ID		RBM728	RBM729	RBM730	RBM731		
Sampling Date		2021/10/27	2021/10/27	2021/10/27	2021/10/27		
COC Number		n/a	n/a	n/a	n/a		
	<b>UNITS</b>	<b>BH1 SS2</b>	<b>BH2 SS1</b>	<b>BH3 SS1</b>	<b>DUP 1</b>	<b>RDL</b>	<b>QC Batch</b>
<b>BTEX &amp; F1 Hydrocarbons</b>							
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	7684968
Toluene	ug/g	<0.020	0.042	<0.020	<0.020	0.020	7684968
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	7684968
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	7684968
p+m-Xylene	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	7684968
Total Xylenes	ug/g	<0.040	<0.040	<0.040	<0.040	0.040	7684968
F1 (C6-C10)	ug/g	<10	<10	<10	<10	10	7684968
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	10	7684968
<b>F2-F4 Hydrocarbons</b>							
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	10	7683132
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	50	7683132
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	50	7683132
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		7683132
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene	%	101	102	100	102		7684968
4-Bromofluorobenzene	%	93	96	92	97		7684968
D10-o-Xylene	%	95	92	90	89		7684968
D4-1,2-Dichloroethane	%	101	99	101	100		7684968
o-Terphenyl	%	110	101	105	119		7683132
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



Bureau Veritas Job #: C1V5753  
Report Date: 2021/11/08

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

## TEST SUMMARY

**Bureau Veritas ID:** RBM728  
**Sample ID:** BH1 SS2  
**Matrix:** Soil

**Collected:** 2021/10/27  
**Shipped:**  
**Received:** 2021/10/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7666587	N/A	2021/11/01	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7684968	N/A	2021/11/07	Abdikarim Ali
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7683132	2021/11/05	2021/11/06	(Kent) Maolin Li
Acid Extractable Metals by ICPMS	ICP/MS	7671112	2021/10/30	2021/11/02	Daniel Teclu
Moisture	BAL	7666998	N/A	2021/10/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7669465	2021/10/29	2021/10/30	Jonghan Yoon

**Bureau Veritas ID:** RBM729  
**Sample ID:** BH2 SS1  
**Matrix:** Soil

**Collected:** 2021/10/27  
**Shipped:**  
**Received:** 2021/10/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7666587	N/A	2021/11/01	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7684968	N/A	2021/11/07	Abdikarim Ali
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7683132	2021/11/05	2021/11/06	(Kent) Maolin Li
Acid Extractable Metals by ICPMS	ICP/MS	7669595	2021/10/29	2021/11/02	Daniel Teclu
Moisture	BAL	7666998	N/A	2021/10/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7669465	2021/10/29	2021/10/30	Jonghan Yoon

**Bureau Veritas ID:** RBM730  
**Sample ID:** BH3 SS1  
**Matrix:** Soil

**Collected:** 2021/10/27  
**Shipped:**  
**Received:** 2021/10/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7666587	N/A	2021/11/01	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7684968	N/A	2021/11/07	Abdikarim Ali
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7683132	2021/11/05	2021/11/06	(Kent) Maolin Li
Acid Extractable Metals by ICPMS	ICP/MS	7669595	2021/10/29	2021/11/02	Daniel Teclu
Moisture	BAL	7666998	N/A	2021/10/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7669465	2021/10/29	2021/10/30	Jonghan Yoon

**Bureau Veritas ID:** RBM731  
**Sample ID:** DUP 1  
**Matrix:** Soil

**Collected:** 2021/10/27  
**Shipped:**  
**Received:** 2021/10/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7666587	N/A	2021/11/01	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	7684968	N/A	2021/11/07	Abdikarim Ali
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	7683132	2021/11/05	2021/11/06	(Kent) Maolin Li
Acid Extractable Metals by ICPMS	ICP/MS	7671234	2021/10/30	2021/11/03	Daniel Teclu
Moisture	BAL	7666998	N/A	2021/10/28	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	7669465	2021/10/29	2021/10/30	Jonghan Yoon





Bureau Veritas Job #: C1V5753  
Report Date: 2021/11/08

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

### GENERAL COMMENTS

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

Package 1	22.3°C
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Report Revised (2021/11/08): PHCs, BTEX/F1-F4 added.

F1/BTEX Analysis: Soil weight exceeds the protocol specification of approximately 5g in the field preserved vial. Additional methanol was added to the vial to ensure extraction efficiency.

Sample RBM728 [BH1 SS2] : F1/BTEX Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

**Results relate only to the items tested.**



Bureau Veritas Job #: C1V5753  
Report Date: 2021/11/08

## QUALITY ASSURANCE REPORT

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7669465	D10-Anthracene	2021/10/29	97	50 - 130	102	50 - 130	100	%		
7669465	D14-Terphenyl (FS)	2021/10/29	93	50 - 130	97	50 - 130	94	%		
7669465	D8-Acenaphthylene	2021/10/29	93	50 - 130	98	50 - 130	90	%		
7683132	o-Terphenyl	2021/11/06	80	60 - 130	85	60 - 130	104	%		
7684968	1,4-Difluorobenzene	2021/11/07	96	60 - 140	96	60 - 140	100	%		
7684968	4-Bromofluorobenzene	2021/11/07	100	60 - 140	100	60 - 140	98	%		
7684968	D10-o-Xylene	2021/11/07	90	60 - 140	112	60 - 140	86	%		
7684968	D4-1,2-Dichloroethane	2021/11/07	93	60 - 140	96	60 - 140	104	%		
7666998	Moisture	2021/10/28							2.1	20
7669465	1-Methylnaphthalene	2021/10/29	112	50 - 130	117	50 - 130	<0.0050	ug/g	NC	40
7669465	2-Methylnaphthalene	2021/10/29	103	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
7669465	Acenaphthene	2021/10/29	105	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
7669465	Acenaphthylene	2021/10/29	97	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
7669465	Anthracene	2021/10/29	103	50 - 130	108	50 - 130	<0.0050	ug/g	NC	40
7669465	Benzo(a)anthracene	2021/10/29	110	50 - 130	110	50 - 130	<0.0050	ug/g	NC	40
7669465	Benzo(a)pyrene	2021/10/29	96	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
7669465	Benzo(b,j)fluoranthene	2021/10/29	107	50 - 130	108	50 - 130	<0.0050	ug/g	NC	40
7669465	Benzo(g,h,i)perylene	2021/10/29	109	50 - 130	114	50 - 130	<0.0050	ug/g	NC	40
7669465	Benzo(k)fluoranthene	2021/10/29	106	50 - 130	117	50 - 130	<0.0050	ug/g	NC	40
7669465	Chrysene	2021/10/29	114	50 - 130	114	50 - 130	<0.0050	ug/g	NC	40
7669465	Dibenzo(a,h)anthracene	2021/10/29	108	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
7669465	Fluoranthene	2021/10/29	107	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
7669465	Fluorene	2021/10/29	108	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40
7669465	Indeno(1,2,3-cd)pyrene	2021/10/29	112	50 - 130	117	50 - 130	<0.0050	ug/g	NC	40
7669465	Naphthalene	2021/10/29	89	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
7669465	Phenanthrene	2021/10/29	108	50 - 130	110	50 - 130	<0.0050	ug/g	NC	40
7669465	Pyrene	2021/10/29	110	50 - 130	115	50 - 130	<0.0050	ug/g	NC	40
7669595	Acid Extractable Antimony (Sb)	2021/11/02	91	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
7669595	Acid Extractable Arsenic (As)	2021/11/02	93	75 - 125	96	80 - 120	<1.0	ug/g	12	30
7669595	Acid Extractable Barium (Ba)	2021/11/02	NC	75 - 125	100	80 - 120	<0.50	ug/g	1.8	30
7669595	Acid Extractable Beryllium (Be)	2021/11/02	95	75 - 125	97	80 - 120	<0.20	ug/g	0.89	30
7669595	Acid Extractable Boron (B)	2021/11/02	89	75 - 125	96	80 - 120	<5.0	ug/g	NC	30



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## QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7669595	Acid Extractable Cadmium (Cd)	2021/11/02	96	75 - 125	96	80 - 120	<0.10	ug/g	NC	30
7669595	Acid Extractable Chromium (Cr)	2021/11/02	103	75 - 125	98	80 - 120	<1.0	ug/g	3.8	30
7669595	Acid Extractable Cobalt (Co)	2021/11/02	97	75 - 125	99	80 - 120	<0.10	ug/g	4.8	30
7669595	Acid Extractable Copper (Cu)	2021/11/02	96	75 - 125	94	80 - 120	<0.50	ug/g	2.4	30
7669595	Acid Extractable Lead (Pb)	2021/11/02	96	75 - 125	97	80 - 120	<1.0	ug/g	6.8	30
7669595	Acid Extractable Molybdenum (Mo)	2021/11/02	96	75 - 125	97	80 - 120	<0.50	ug/g	17	30
7669595	Acid Extractable Nickel (Ni)	2021/11/02	97	75 - 125	100	80 - 120	<0.50	ug/g	0.85	30
7669595	Acid Extractable Selenium (Se)	2021/11/02	95	75 - 125	99	80 - 120	<0.50	ug/g	NC	30
7669595	Acid Extractable Silver (Ag)	2021/11/02	96	75 - 125	97	80 - 120	<0.20	ug/g	NC	30
7669595	Acid Extractable Thallium (Tl)	2021/11/02	91	75 - 125	96	80 - 120	<0.050	ug/g	16	30
7669595	Acid Extractable Uranium (U)	2021/11/02	95	75 - 125	99	80 - 120	<0.050	ug/g	0.62	30
7669595	Acid Extractable Vanadium (V)	2021/11/02	NC	75 - 125	100	80 - 120	<5.0	ug/g	8.9	30
7669595	Acid Extractable Zinc (Zn)	2021/11/02	NC	75 - 125	101	80 - 120	<5.0	ug/g	0.14	30
7671112	Acid Extractable Antimony (Sb)	2021/11/02	99	75 - 125	96	80 - 120	<0.20	ug/g	NC	30
7671112	Acid Extractable Arsenic (As)	2021/11/02	98	75 - 125	93	80 - 120	<1.0	ug/g	11	30
7671112	Acid Extractable Barium (Ba)	2021/11/02	NC	75 - 125	97	80 - 120	<0.50	ug/g	1.2	30
7671112	Acid Extractable Beryllium (Be)	2021/11/02	101	75 - 125	94	80 - 120	<0.20	ug/g	4.3	30
7671112	Acid Extractable Boron (B)	2021/11/02	98	75 - 125	93	80 - 120	<5.0	ug/g	6.1	30
7671112	Acid Extractable Cadmium (Cd)	2021/11/02	103	75 - 125	96	80 - 120	<0.10	ug/g	NC	30
7671112	Acid Extractable Chromium (Cr)	2021/11/02	NC	75 - 125	97	80 - 120	<1.0	ug/g	2.9	30
7671112	Acid Extractable Cobalt (Co)	2021/11/02	100	75 - 125	98	80 - 120	<0.10	ug/g	2.2	30
7671112	Acid Extractable Copper (Cu)	2021/11/02	99	75 - 125	96	80 - 120	<0.50	ug/g	0.24	30
7671112	Acid Extractable Lead (Pb)	2021/11/02	104	75 - 125	99	80 - 120	<1.0	ug/g	6.1	30
7671112	Acid Extractable Molybdenum (Mo)	2021/11/02	103	75 - 125	98	80 - 120	<0.50	ug/g	NC	30
7671112	Acid Extractable Nickel (Ni)	2021/11/02	104	75 - 125	97	80 - 120	<0.50	ug/g	3.5	30
7671112	Acid Extractable Selenium (Se)	2021/11/02	101	75 - 125	95	80 - 120	<0.50	ug/g	NC	30
7671112	Acid Extractable Silver (Ag)	2021/11/02	104	75 - 125	98	80 - 120	<0.20	ug/g	NC	30
7671112	Acid Extractable Thallium (Tl)	2021/11/02	105	75 - 125	100	80 - 120	<0.050	ug/g	8.7	30
7671112	Acid Extractable Uranium (U)	2021/11/02	106	75 - 125	100	80 - 120	<0.050	ug/g	9.3	30
7671112	Acid Extractable Vanadium (V)	2021/11/02	NC	75 - 125	97	80 - 120	<5.0	ug/g	3.1	30
7671112	Acid Extractable Zinc (Zn)	2021/11/02	NC	75 - 125	98	80 - 120	<5.0	ug/g	0.20	30
7671234	Acid Extractable Antimony (Sb)	2021/11/03	99	75 - 125	95	80 - 120	<0.20	ug/g	NC	30



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## QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7671234	Acid Extractable Arsenic (As)	2021/11/03	102	75 - 125	98	80 - 120	<1.0	ug/g	22	30
7671234	Acid Extractable Barium (Ba)	2021/11/03	NC	75 - 125	94	80 - 120	<0.50	ug/g	7.6	30
7671234	Acid Extractable Beryllium (Be)	2021/11/03	106	75 - 125	96	80 - 120	<0.20	ug/g	11	30
7671234	Acid Extractable Boron (B)	2021/11/03	100	75 - 125	95	80 - 120	<5.0	ug/g	7.4	30
7671234	Acid Extractable Cadmium (Cd)	2021/11/03	101	75 - 125	95	80 - 120	<0.10	ug/g	NC	30
7671234	Acid Extractable Chromium (Cr)	2021/11/03	107	75 - 125	98	80 - 120	<1.0	ug/g	6.3	30
7671234	Acid Extractable Cobalt (Co)	2021/11/03	107	75 - 125	99	80 - 120	<0.10	ug/g	4.2	30
7671234	Acid Extractable Copper (Cu)	2021/11/03	101	75 - 125	92	80 - 120	<0.50	ug/g	4.2	30
7671234	Acid Extractable Lead (Pb)	2021/11/03	109	75 - 125	97	80 - 120	<1.0	ug/g	11	30
7671234	Acid Extractable Molybdenum (Mo)	2021/11/03	105	75 - 125	95	80 - 120	<0.50	ug/g	NC	30
7671234	Acid Extractable Nickel (Ni)	2021/11/03	107	75 - 125	96	80 - 120	<0.50	ug/g	4.4	30
7671234	Acid Extractable Selenium (Se)	2021/11/03	104	75 - 125	98	80 - 120	<0.50	ug/g	NC	30
7671234	Acid Extractable Silver (Ag)	2021/11/03	102	75 - 125	97	80 - 120	<0.20	ug/g	NC	30
7671234	Acid Extractable Thallium (Tl)	2021/11/03	102	75 - 125	97	80 - 120	<0.050	ug/g	5.2	30
7671234	Acid Extractable Uranium (U)	2021/11/03	103	75 - 125	97	80 - 120	<0.050	ug/g	4.3	30
7671234	Acid Extractable Vanadium (V)	2021/11/03	NC	75 - 125	95	80 - 120	<5.0	ug/g	9.4	30
7671234	Acid Extractable Zinc (Zn)	2021/11/03	NC	75 - 125	95	80 - 120	<5.0	ug/g	7.8	30
7683132	F2 (C10-C16 Hydrocarbons)	2021/11/08	85	50 - 130	89	80 - 120	<10	ug/g	NC	30
7683132	F3 (C16-C34 Hydrocarbons)	2021/11/08	85	50 - 130	91	80 - 120	<50	ug/g	5.8	30
7683132	F4 (C34-C50 Hydrocarbons)	2021/11/08	84	50 - 130	90	80 - 120	<50	ug/g	NC	30
7684968	Benzene	2021/11/07	89	50 - 140	105	50 - 140	<0.020	ug/g	NC	50
7684968	Ethylbenzene	2021/11/07	98	50 - 140	109	50 - 140	<0.020	ug/g	NC	50
7684968	F1 (C6-C10) - BTEX	2021/11/07					<10	ug/g	NC	30
7684968	F1 (C6-C10)	2021/11/07	93	60 - 140	103	80 - 120	<10	ug/g	NC	30
7684968	o-Xylene	2021/11/07	97	50 - 140	109	50 - 140	<0.020	ug/g	NC	50
7684968	p+m-Xylene	2021/11/07	93	50 - 140	104	50 - 140	<0.040	ug/g	NC	50
7684968	Toluene	2021/11/07	90	50 - 140	102	50 - 140	<0.020	ug/g	NC	50



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## QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7684968	Total Xylenes	2021/11/07					<0.040	ug/g	NC	50
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference &lt;= 2x RDL).</p>										



Bureau Veritas Job #: C1V5753  
Report Date: 2021/11/08

exp Services Inc  
Client Project #: OTT-21019403-A0  
Sampler Initials: MM

### VALIDATION SIGNATURE PAGE

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

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

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

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

27-Oct-21 16:11

Katherine Szozda



C1V5753

CDT ENV 1404

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company:	EXP Services Inc.	Company:		Quotation #:	EXP Stream 3
Contact Name:	MARK MCCALLA	Contact Name:		P.O. #/ A/R:	
Street Address:	2650 Queensview Dr	Street Address:		Project #:	OTT-21019403-A0
City:	OTTAWA	City:		Site #:	
Prov:	ON	Prov:		Site Location:	
Postal Code:		Postal Code:		Site Location Province:	
Phone:	617 688 1899	Phone:		Sampled By:	MM
Email:	Mark.McCalla@exp.com	Email:			
Copies:		Copies:			

Sample Identification	Date Sampled					Status	Analysis											
	YY	MM	DD	HH	MM		1	2	3	4	5	6	7	8	9	10	11	12
BH1 SS 2	21	10	27				X	X	X	X	X							
BH2 SS1							X	X	X	X	X							
BH3 SS1							X	X	X	X	X							
DVP 1							X	X	X	X	X							

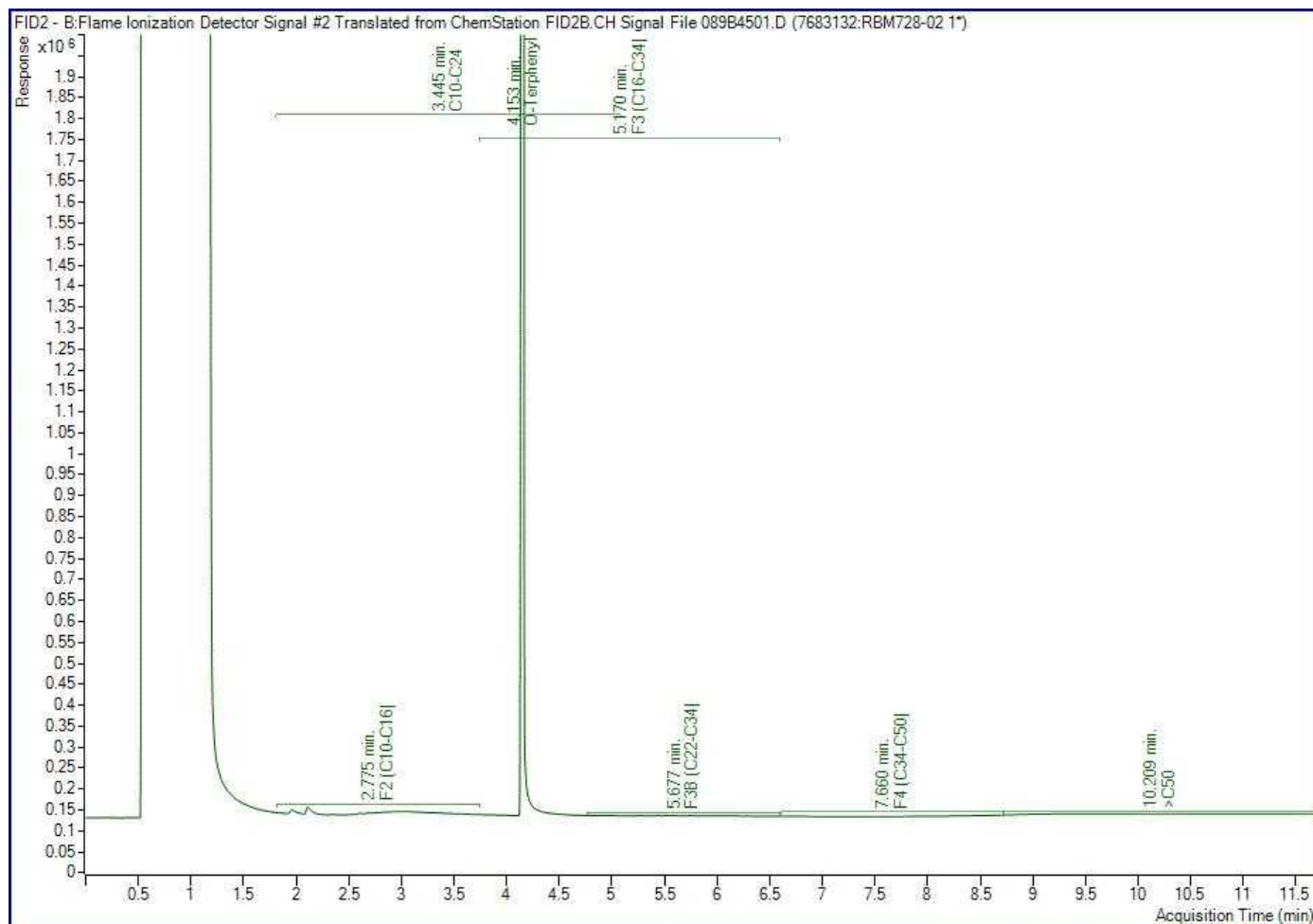
LAB USE ONLY		Yes		No		Temp		Yes		No		Temp		Yes		No		Temp	
Seal present						20	9	10	Seal present					22	22	23	Seal present		
Seal intact									Seal intact								Seal intact		
Cooling media present									Cooling media present								Cooling media present		
Relinquished by: (Signature/Print)		YY		MM		DD		HH		MM		YY		YY		MM		DD	
Mark McCalla		21		10		27		4		10		Angelica Santiago		21		10		27	

Handed over to client 2021/10/28 08:00

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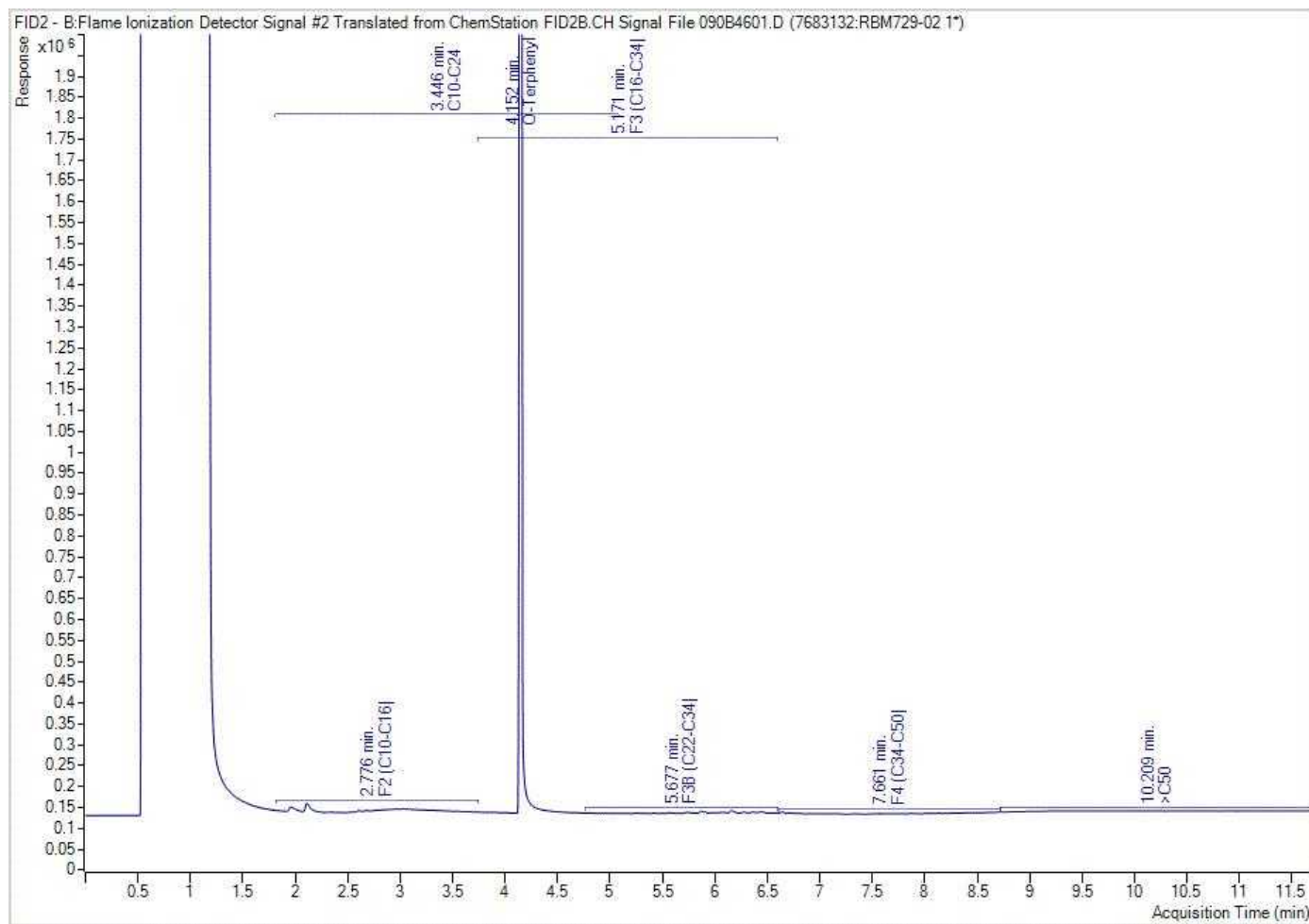


Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



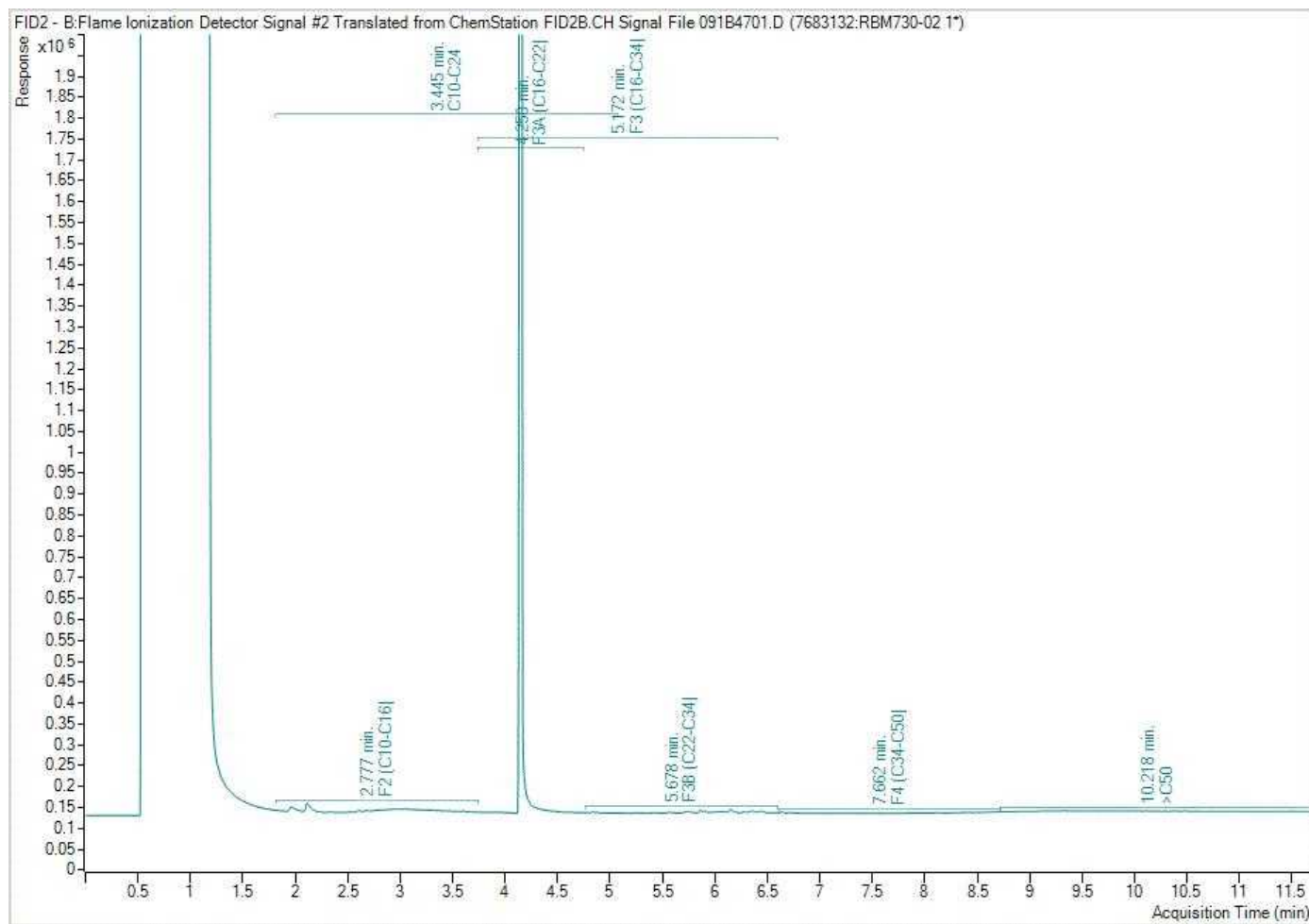
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



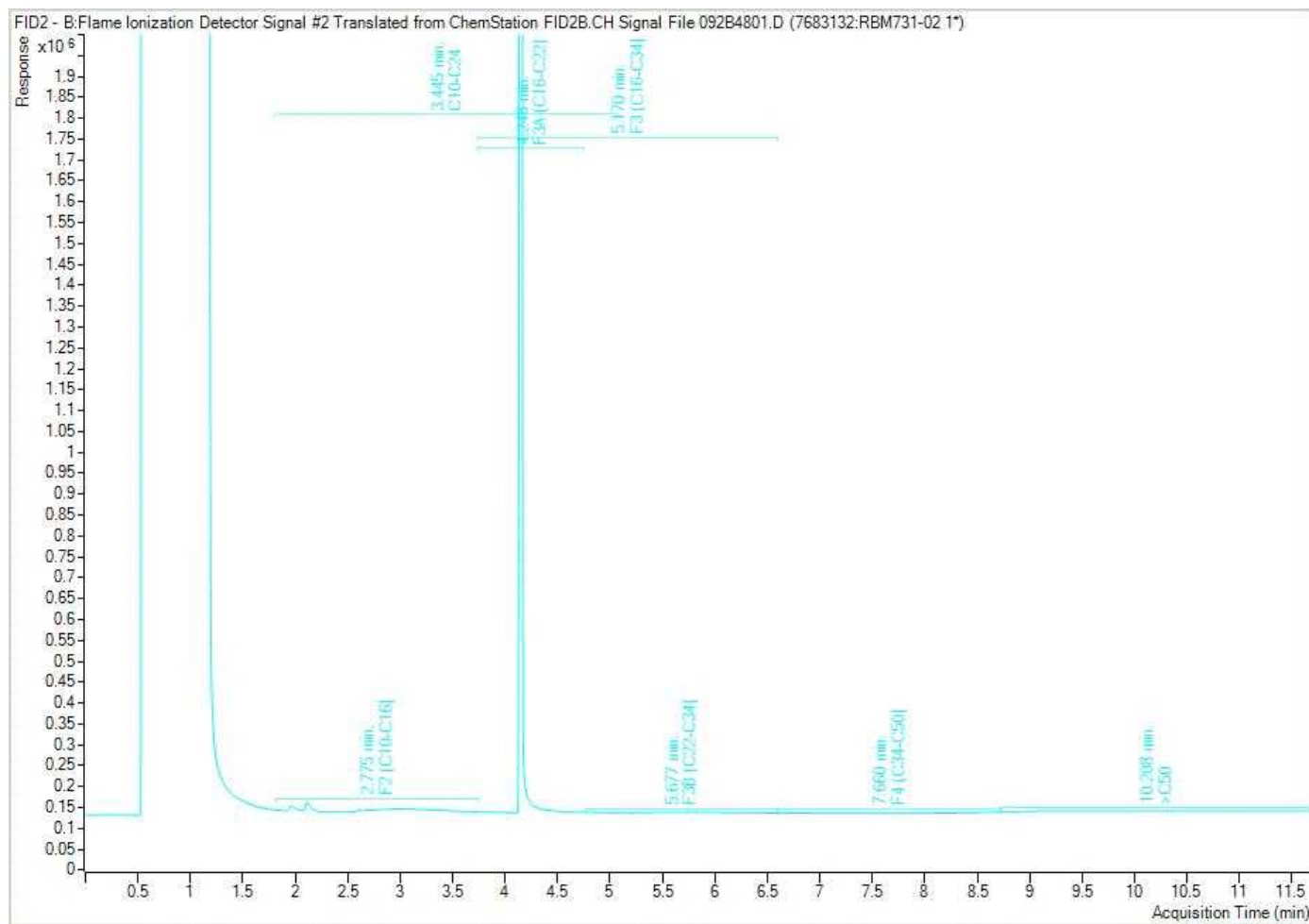
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

EXP Services Inc.

*Nemorin Group Limited*  
*Phase Two Environmental Site Assessment*  
*1568 Meadowbrook Road, Ottawa, Ontario*  
*OTT-21019403-A0*  
November 30, 2021

