PATERSON GROUP

Phase II – Environmental Site Assessment

266 Park Street

Ottawa, Ontario

Prepared for Concorde Properties

Report: PE5651-3
May 14, 2024

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the property addressed 266 Park Street, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address the potentially contaminating activities (PCAs) that were identified during the Phase I ESA and were considered to result in areas of potential environmental concern (APECs) on the Phase II Property.

The subsurface investigation for this assessment was conducted on April 1, 2024, and consisted of drilling eight boreholes (BH1-24 to BH8-24) throughout the Phase II Property. It should be noted that the data obtained from one previously drilled borehole (BH7-22) and one previously installed monitoring well (BH3-22) were utilized as part of this assessment. Boreholes BH1-24 and BH2-24 were advanced to depths of 6.12 m and 5.97 m below the existing ground surface, respectively, and terminated within the underlying shale bedrock. Upon completion, these two boreholes were instrumented with groundwater monitoring wells in order to access the water table. Boreholes BH3-24 to BH8-24 were advanced to depths ranging from approximately 1.73 m to 2.41 m below the existing ground surface and terminated within an overburden layer of stiff, brown silty clay on practical refusal to augering on the inferred bedrock surface.

In general, the subsurface soil profile encountered at the borehole locations consists of a shallow overburden comprised of a surficial pavement structure (asphaltic concrete over top of granular sub-grade fill), underlain by another layer of fill material (brown silty clay with sand, gravel, and trace brick), over top of native brown silty clay with sand and gravel. Bedrock, consisting of poor quality shale, was confirmed in boreholes BH3-22, BH1-24, and BH2-24 at depths ranging from approximately 1.73 m to 2.03 m below ground surface. The groundwater beneath the Phase II Property was encountered within the shale bedrock at depths ranging from approximately 2.39 m to 2.55 m below the existing ground surface.

Eight soil samples were submitted for laboratory analysis of BTEX, PHCs (F_1-F_4), metals, PAHs, EC, SAR, and/or pH parameters. It should be noted that the historical soil testing data obtained from the two previously drilled boreholes (BH3-22 and BH7-22) was also utilized as part of this assessment. The concentrations of lead and/or multiple PAH parameters detected in the soil/fill material across the majority of the site were found to be in excess of the selected MECP Table 7 Coarse-Grained Residential Soil Standards.

Some elevated levels of EC and SAR were also identified within the soil/fill material layer across the site, however, it should be noted that these exceedances are considered to be a result of the use of a road salt for de-icing purposes during snow and ice conditions, and as such, are deemed to meet the selected site standards in accordance with Section 49.1 of O. Reg. 153/04.

Three groundwater samples were also submitted for laboratory analysis of VOCs, PHCs (F_1-F_4), and PAH parameters. It should be noted that the historical groundwater testing data obtained from a previously installed monitoring well (BH3-22) was also utilized as part of this assessment. All detected parameters were found to comply with the selected MECP Table 7 Non-Potable Groundwater Standards.

Recommendations

Soil

Based on the findings of this assessment, the layer of soil/fill material found underneath the pavement structure across the majority of the Phase II Property is deemed to be contaminated, requiring remedial action. This impacted layer, approximately 1 meter in thickness, appears to be prevalent across the majority of the Phase II Property area and was encountered within the depth interval ranging from approximately 0.6 m to 1.8 m below the existing ground surface.

Given our understanding that the Phase II Property is to be redeveloped in the near future, it is our recommendation that the contaminated soil be remediated in conjunction with site excavation activities. At such a time, the contaminated soil will be excavated from the site and transported to a licensed waste disposal facility. It is recommended that Paterson personnel be present on-site at the time of remedial activities to assist with coordination, directing the excavation and segregation of contaminated soil from clean soils, as well as to fulfill the confirmatory soil sampling requirements in accordance with Table 3 of O. Reg. 153/04.

Prior to the off-site disposal of impacted soil at a licensed waste disposal facility, a leachate analysis of a representative sample of contaminated soil must be conducted in accordance with O. Reg. 347/90 and O. Reg. 558/00.

Based on the soil test results obtained from this assessment, the underlying clean native soils on-site comply with the MECP Table 2.1 Excess Soil Quality Standards (O. Reg. 406/19) for off-site disposal. Additional excess soil testing may be required prior to future site excavation activities.

Monitoring Wells

If the groundwater monitoring wells installed on-site are not going to be used in the future, or will be destroyed during future construction activities, then they must be decommissioned in accordance with O. Reg. 903/90 (Ontario Water Resources Act). Further information can be provided upon request in this regard.

It is our recommendation that the monitoring wells currently be maintained for future sampling purposes, until such a time when future site excavation activities have commenced. The monitoring wells will be registered with the MECP under this regulation.

1.0 INTRODUCTION

At the request of Concorde Properties, Paterson Group (Paterson) conducted a Phase II – Environmental Site Assessment (Phase II ESA) for the property addressed 266 Park Street, in the City of Ottawa, Ontario (the Phase II Property).

The purpose of this Phase II ESA has been to address the areas of potential environmental concern (APECs) identified on the Phase II Property as a result of the findings of the Phase I ESA.

1.1 Site Description

Address:	266 Park Street, Ottawa, Ontario.
Location:	The Phase II Property is located on the west side of Park Street, approximately 50 m north of Montreal Road, in the City of Ottawa, Ontario. Refer to Figure 1 – Key Plan, appended to this report.
Latitude and Longitude:	45° 26' 13.5" N, 75° 39' 38.5" W.

Site Description:

Configuration:	Rectangular.
Site Area:	607 m^2 (approximate).
Zoning:	TM – Traditional Main Street Zone.
Current Uses:	The Phase II Property is currently vacant and used for vehicular parking.
Services:	The Phase II Property is located within a municipally serviced area.

1.2 Property Ownership

The Phase II Property is currently owned by Concorde Properties. Paterson was retained to complete this Phase II ESA by Mr. Jordan Tannis of Concorde Properties, whose offices are located at 408 Tweedsmuir Avenue, Ottawa, Ontario. Mr. Tannis can be contacted via telephone at 613-778-8118.

1.3 Applicable Site Condition Standard

The site condition standards for the subject property were obtained from Table 7 of the document entitled, *"Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act"*, prepared by the Ministry of the Environment, Conservation and Parks (MECP), and dated April 15, 2011. The selected MECP standards are based on the following considerations:

- ❒ Shallow soil conditions;
- ❒ Coarse-grained soil conditions;
- ❒ Non-potable groundwater conditions;
- ❒ Residential land use.

Grain size analysis was not conducted as part of this assessment, and as such, the coarse-grained soil standards were selected as a conservative approach.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is approximately 600 m^2 in area and is currently vacant and largely paved with an asphaltic concrete parking lot for personal vehicles.

The site topography slopes downwards to the east, in the general direction of Park Street, while the regional topography slopes downwards to the north, in the general direction of the Ottawa River. The Phase II Property is considered to be at grade with respect to Park Street and the neighbouring properties to the south and west.

Water drainage on the Phase II Property occurs primarily via surface runoff towards catch basins located on the adjacent street. No ponded water, stressed vegetation, surficial staining, or any other indications of potential sub-surface contamination were observed on the Phase II Property at time of the site inspection.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation for this assessment was conducted on April 1, 2024, and consisted of drilling eight boreholes (BH1-24 to BH8-24) throughout the Phase II Property. It should be noted that the data obtained from one previously drilled borehole (BH7-22) and one previously installed monitoring well (BH3-22) were utilized as part of this assessment.

Boreholes BH1-24 and BH2-24 were advanced to depths of 6.12 m and 5.97 m below the existing ground surface, respectively, and terminated within the underlying shale bedrock. Upon completion, these two boreholes were instrumented with groundwater monitoring wells in order to access the water table. During the field sampling program, the groundwater was measured at depths ranging from approximately 2.39 m to 2.55 m below the existing ground surface.

The remaining boreholes (BH3-24 to BH8-24) were advanced to depths ranging from approximately 1.73 m to 2.41 m below the existing ground surface and terminated within an overburden layer of stiff, brown silty clay on practical refusal to augering on inferred bedrock.

3.2 Media Investigated

During the course of this subsurface investigation, soil and groundwater samples were obtained from the Phase II Property and submitted for laboratory analysis. The rationale for sampling and analyzing these media is based on the contaminants of potential concern identified in the Phase I ESA.

The contaminants of potential concern for the soil and groundwater on the Phase II Property include the following:

- ❒ Volatile Organic Compounds (VOCs);
- ❒ Petroleum Hydrocarbons, fractions 1 – 4 (PHCs F_1-F_4);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);
- ❒ Metals (including Arsenic [As], Antimony [Sb], and Selenium [Se])
- ❒ Mercury;
- ❒ Hexavalent Chromium;
- ❒ Electrical Conductivity (EC);
- ❒ Sodium Adsorption Ratio (SAR).

These CPCs have the potential to be present in the soil matrix and/or the groundwater situated beneath the Phase II Property.

3.3 Phase I ESA Conceptual Site Model

Geological and Hydrogeological Setting

Based on the available mapping information, the bedrock beneath the Phase II Property generally consists of shale of the Billings Formation, while the surficial geology consists largely of glacial till plains with an overburden ranging in thickness from approximately 2 m to 3 m.

Groundwater is anticipated to be encountered within the bedrock and flow in a westerly direction towards the Rideau River.

Water Bodies and Areas of Natural and Scientific Interest

No water bodies or areas of natural and scientific interest were identified within a 250 m radius of the Phase II Property.

The nearest named water body with respect to the Phase II Property is the Rideau River, located approximately 850 m to the west.

Drinking Water Wells

Based on the availability of municipal services, no drinking water wells are expected to be present within a 250 m radius of the Phase II Property.

Existing Buildings and Structures

No buildings or structures are currently present on the Phase II Property.

Current and Future Property Use

The Phase II Property is currently being used for commercial purposes as a vehicle parking lot.

It is our understanding that the Phase II Property is to be redeveloped with a low-rise residential apartment building.

Due to the change to a more sensitive land use (commercial to residential), this will require that a record of site condition (RSC) be filed with the MECP.

Neighbouring Land Use

The surrounding lands within a 250 m radius of the Phase II Property consist largely of residential properties, with commercial properties present along Montreal Road.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Section 7.1 of the Phase I ESA report, three potentially contaminating activities (PCAs), resulting in areas of potential environmental concern (APECs), were identified on the Phase II Property. These APECs include:

- ❑ Fill material of unknown quality, located throughout the Phase II Property;
- ❑ The application of road salt during snow and/or ice conditions, located throughout the Phase II Property.
- ❑ A former off-site dry cleaners, located approximately 20 m to the south of the Phase II Property (265 Montreal Road).

Other off-site PCAs were identified within a 250 m radius of the Phase II Property, but were deemed not to be of any environmental concern based on their separation distances and/or their inferred down-gradient or cross-gradient orientation with respect to anticipated groundwater flow to the north.

Contaminants of Potential Concern

The contaminants of potential concern (CPCs) associated with the aforementioned APECs are considered to be:

- ❒ Volatile Organic Compounds (VOCs);
- ❒ Petroleum Hydrocarbons, fractions 1 – 4 (PHCs F_1-F_4);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);
- ❒ Metals (including Arsenic [As], Antimony [Sb], and Selenium [Se])
- ❒ Mercury;
- ❒ Hexavalent Chromium;
- ❒ Electrical Conductivity (EC);
- ❒ Sodium Adsorption Ratio (SAR).

These CPCs have the potential to be present in the soil matrix and/or the groundwater situated beneath the Phase II Property.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of the Phase I ESA is considered to be sufficient to conclude that there are PCAs and APECs associated with the Phase II Property.

The presence of any PCAs was confirmed by a variety of independent sources, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

3.4 Deviations from the Sampling and Analysis Plan

No deviations from the Sampling and Analysis were made during the course of this Phase II ESA.

3.5 Physical Impediments

No physical impediments were encountered during the course of the field drilling program.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation for this assessment was conducted on April 1, 2024, and consisted of drilling eight boreholes (BH1-24 to BH8-24) throughout the Phase II Property. It should be noted that the data obtained from one previously drilled borehole (BH7-22) and one previously installed monitoring well (BH3-22) were utilized as part of this assessment.

Boreholes BH1-24 and BH2-24 were advanced to depths of 6.12 m and 5.97 m below the existing ground surface, respectively, and terminated within the underlying shale bedrock. Upon completion, these two boreholes were instrumented with groundwater monitoring wells in order to access the water table.

The remaining boreholes (BH3-24 to BH8-24) were advanced to depths ranging from approximately 1.73 m to 2.41 m below the existing ground surface and terminated within an overburden layer of stiff, brown silty clay on practical refusal to augering on inferred bedrock.

Under the full-time supervision of Paterson personnel, the boreholes were drilled using a truck-mounted drill rig provided by George Downing Estate Drilling of Hawkesbury, Ontario. The locations of the boreholes are illustrated on "Drawing PE5651-4 – Test Hole Location Plan", appended to this report.

4.2 Soil Sampling

Soil sampling protocols were followed using the MECP document entitled, *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario"*, dated May 1996.

The samples were recovered using a stainless-steel split spoon, while wearing protective gloves (changed after each sample), and immediately placed into plastic bags. If significant contamination was encountered, the samples were instead placed into glass jars. Sampling equipment was routinely washed in soapy water and rinsed with methylhydrate after each split spoon to prevent any cross contamination of the samples. The samples were also stored in coolers to reduce analyte volatilization during transportation.

A total of 27 soil samples were obtained from boreholes BH1-24 to BH8-24 by means of auger and split spoon sampling. The depths at which auger, split spoon, and rock core samples were obtained from the boreholes are shown as "**AU**", "**SS**", and "**RC**" respectively, on the Soil Profile and Test Data Sheets, appended to this report.

4.3 Field Screening Measurements

All soil samples collected were subjected to a preliminary screening procedure, which included visual screening for colour and evidence of metals, as well as soil vapour screening with a Photo Ionization Detector.

The recovered soil samples were placed immediately into airtight plastic bags with nominal headspace. All lumps of soil inside the bags were broken by hand, and the soil was allowed to come to room temperature prior to conducting the vapour survey, ensuring consistency of readings between samples. To measure the soil vapours, the analyser probe was inserted into the nominal headspace above the sample. The sample was then agitated and manipulated gently by hand as the measurement was taken. The peak reading registered within the first 15 seconds was recorded as the vapour measurement. The parts per million (ppm) scale was used to measure concentrations of organic vapours.

The results of the vapour survey are presented on the Soil Profile and Test Data Sheets, appended to this report.

4.4 Groundwater Monitoring Well Installation

Three groundwater monitoring wells were installed on the Phase II Property as part of this assessment. These monitoring wells were constructed using 32 mm diameter Schedule 40 threaded PVC risers and screens. A sand pack consisting of silica sand was placed around the screen with a bentonite seal placed above to minimize cross-contamination. A summary of the monitoring well construction details are listed below in Table 1 as well as on the Soil Profile and Test Data Sheets provided in Appendix 1.

Upon completion, the groundwater monitoring wells were developed using a dedicated inertial lift pump, with a minimum of three well volumes being removed from the wells at the time of installation. The wells were developed until the appearance of the water was noted to have stabilized. In addition, the ground surface elevations of each borehole were subsequently surveyed with respect to a known geodetic elevation.

Table 1
Monitoring Well Construction Details

Well ID	Ground Surface Elevation (m ASL)	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH3-22	59.71	6.07	3.07 – 6.07	2.72 – 6.07	0.00 – 2.72	Flushmount
BH1-24	59.61	6.12	3.12 – 6.12	2.74 – 6.12	1.52 – 2.74	Flushmount
BH2-24	60.47	5.97	2.97 – 5.97	2.45 – 5.97	1.83 – 5.97	Flushmount

4.5 Field Measurement of Water Quality Parameters

Groundwater monitoring and sampling was conducted on-site on April 12, 2024. Following their development and stabilization during the field sampling event, select water quality parameters were measured at each monitoring well location using a multi-reader probe device. The stabilized field parameter values are summarized below in Table 2.

Table 2
Measurement of Water Quality Parameters

Well ID	Temperature (˚C)	Conductivity (µS)	pH (Units)
BH3-22	10.3	>3,999	6.76
BH1-24	11.7	>3,999	7.06
BH2-24	11.3	>3,999	7.03

It should be noted that the elevated conductivity levels detected in the purged groundwater at each monitoring well location are suspected to be the result of dissolved road salt which had been applied to the Phase II Property in the winter months during snow and ice conditions.

4.6 Groundwater Sampling

Groundwater sampling protocols were followed using the MECP document entitled, *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario"*, dated May 1996.

Standing water was purged from each monitoring well prior to the recovery of the groundwater samples using dedicated sampling equipment. The samples were then stored in coolers to reduce possible analyte volatilization during their transportation. Further details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan, appended to this report.

4.7 Analytical Testing

The following soil and groundwater samples were submitted for laboratory analysis:

Table 3
Testing Parameters for Submitted Soil Samples

Sample ID	Sample Depth & Stratigraphic Unit	Parameters Analyzed									Rationale
		BTEX	PHCs (F_1-F_4)	Metals	Hg+	Cr^{VI}	PAHs	EC	SAR	pH	
BH1-24-SS2	0.76 – 1.37 m Fill Material	X	X	X	X	X	X	X	X	X	To assess for potential soil impacts resulting from the presence of fill material of unknown quality.
BH2-24-SS2	0.76 – 1.37 m Fill Material	X	X	X	X	X	X	X	X		To assess for potential soil impacts resulting from the presence of fill material of unknown quality.
BH2-24-SS3	1.52 – 2.13 m Silty Clay			X	X	X	X				For vertical delineation of soil contaminants identified in the surficial fill material.
BH3-24-SS2	0.76 – 1.37 m Fill Material	X	X	X	X	X	X	X	X		To assess for potential soil impacts resulting from the presence of fill material of unknown quality.
BH3-24-SS3	1.52 – 2.13 m Silty Clay			X	X	X	X				For vertical delineation of soil contaminants identified in the surficial fill material.
BH4-24-SS2	0.76 – 1.37 m Fill Material	X	X	X	X	X	X	X	X		To assess for potential soil impacts resulting from the presence of fill material of unknown quality.
BH5-24-SS2	0.76 – 1.37 m Fill Material			X	X	X	X				For horizontal delineation of soil contaminants identified in the surficial fill material.
BH8-24-SS2	0.76 – 1.37 m Fill Material			X	X	X	X				For horizontal delineation of soil contaminants identified in the surficial fill material.
DUP1[1]	0.76 – 1.37 m Fill Material	X	X	X							For laboratory QA/QC purposes.

1 – Duplicate sample of BH1-24-SS2

Table 4
Testing Parameters for Submitted Groundwater Samples

Sample ID	Screened Interval & Stratigraphic Unit	Parameters Analyzed			Rationale
		VOCs	PHCs (F_1-F_4)	PAHs	
BH3-22-GW2	3.07 – 6.07 m Shale Bedrock	X	X	X	To assess for potential groundwater impacts resulting from the downward migration of contaminants from the impacted surficial fill identified on-site, as well as due to the presence of a former off-site dry cleaners to the south.
BH1-24-GW1	3.12 – 6.12 m Shale Bedrock	X	X	X	
BH2-24-GW1	2.97 – 5.97 m Shale Bedrock	X	X	X	
DUP[1]	3.07 – 6.07 m Shale Bedrock	X			For laboratory QA/QC purposes.
Trip Blank	N/A	X			

1 – Duplicate sample of BH3-22-GW1

Paracel Laboratories (Paracel), of Ottawa, Ontario, performed the laboratory analysis on the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA) and is accredited and certified by the SCC/CALA for specific tests registered with the association.

4.8 Residue Management

All soil cuttings were removed from the site following the field program, while all purge water and equipment cleaning fluids were retained on-site.

4.9 Elevation Surveying

The ground surface elevations at each borehole location were surveyed using a GPS device by Paterson personnel and referenced to a geodetic datum.

4.10 Quality Assurance and Quality Control Measures

A summary of the quality assurance and quality control (QA/QC) measures, undertaken as part of this assessment, is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

In general, the subsurface soil profile encountered at the borehole locations consists of a shallow overburden comprised of a surficial pavement structure (asphaltic concrete over top of granular sub-grade fill), underlain by another layer of fill material (brown silty clay with sand, gravel, and trace brick), over top of native brown silty clay with sand and gravel.

Bedrock, consisting of poor quality shale, was confirmed in boreholes BH3-22, BH1-24, and BH2-24 at depths ranging from approximately 1.73 m to 2.03 m below ground surface. Practical refusal to augering on the inferred bedrock surface was measured in boreholes BH7-22 and BH3-24 to BH8-24 at depths ranging from approximately 1.63 m to 2.13 m below ground surface.

Site geology details are provided in the Soil Profile and Test Data Sheets in Appendix 1.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels beneath the Phase II Property were most recently measured using an electronic water level meter on April 12, 2024. The groundwater levels are summarized below in Table 5.

Table 5
Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH3-22	59.71	2.55	57.16	April 12, 2024
BH1-24	59.61	2.40	57.21	
BH2-24	60.47	2.39	58.08	

The groundwater at the Phase II Property was encountered within the bedrock at depths ranging from approximately 2.39 m to 2.55 m below ground surface.

No unusual visual observations were identified within the recovered groundwater samples at the time of the field sampling event.

Using the groundwater elevations recorded during the sampling event, groundwater contour mapping was completed as part of this assessment. According to the mapped contour data, illustrated on Drawing PE5651-4 – Test Hole Location Plan in the appendix, the groundwater flow beneath the Phase II Property was calculated to be in a northeasterly direction. A horizontal hydraulic gradient of approximately 0.066 m/m was also calculated as part of this assessment.

It should be noted that groundwater levels are expected to fluctuate throughout the year with seasonal variations.

5.3 Fine/Coarse Soil Texture

Grain size analysis was not completed as part of this investigation. As a result, the coarse-grained soil standards were chosen as a conservative approach.

5.4 Field Screening

Field screening of the soil samples collected during the drilling program resulted in organic vapour readings ranging from 0.8 ppm to 11.3 ppm, indicating that there is a negligible potential for the presence of volatile substances. Field screening results of each individual soil sample are provided on the Soil Profile and Test Data Sheets appended to this report.

5.5 Soil Quality

As part of this assessment, eight soil samples were submitted for laboratory analysis of BTEX, PHCs (F_1-F_4), metals, PAHs, EC, SAR, and/or pH parameters. It should be noted that the historical soil testing data obtained from two previously drilled boreholes (BH3-22 and BH7-22) was also utilized as part of this assessment.

The results of the analytical testing are presented below in Tables 6 to 9, as well as on the laboratory certificates of analysis included in Appendix 1.

Table 6
Analytical Test Results – Soil
BTEX & PHCs (F_1-F_4)

Parameter	MDL (µg/g)	Soil Samples (ug/g)					MECP Table 7 Coarse-Grained Residential Soil Standards (µg/g)
		April 11, 2022	April 1, 2024				
		BH7-22-SS3	BH1-24-SS2	BH2-24-SS2	BH3-24-SS2	BH4-24-SS2	
		Sample Depth (m bgs)					
		1.52 – 2.13 m	0.76 – 1.37 m	0.76 – 1.37 m	0.76 – 1.37 m	0.76 – 1.37 m	
Benzene	0.02	nd	nd	nd	nd	nd	0.21
Ethylbenzene	0.05	0.06	nd	nd	nd	nd	2
Toluene	0.05	0.25	nd	nd	nd	nd	2.3
Xylenes	0.05	1.24	nd	nd	nd	nd	3.1
PHCs F_1	7	11	nd	nd	nd	nd	55
PHCs F_2	4	70	nd	16	11	11	98
PHCs F_3	8	81	40	155	89	52	300
PHCs F_4	6	29	50	61	64	37	2,800

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

All detected BTEX and PHC parameter concentrations in the soil samples analyzed are in compliance with the selected MECP Table 7 Coarse-Grained Residential Soil Standards.

Table 7
Analytical Test Results – Soil
Metals

Parameter	MDL (µg/g)	Soil Samples (ug/g)									MECP Table 7 Coarse-Grained Residential Soil Standards (µg/g)
		April 12, 2022	April 1, 2024								
		BH3-22-SS2	BH1-24-SS2	BH2-24-SS2	BH2-24-SS3	BH3-24-SS2	BH3-24-SS3	BH4-24-SS2	BH5-24-SS2	BH8-24-SS2	
		Sample Depth (m bgs)									
		0.76-1.37 m	0.76-1.37 m	0.76-1.37 m	1.52-2.13 m	0.76-1.37 m	1.52-2.13 m	0.76-1.37 m	0.76-1.37 m	0.76-1.37 m	
Antimony	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	7.5
Arsenic	1.0	8.4	6.9	12.5	6.4	8.0	5.8	4.4	5.8	6.9	18
Barium	1.0	88.1	111	216	80.6	174	78.2	62.7	114	87.3	390
Beryllium	0.5	0.9	1.2	1.0	0.8	0.7	0.7	nd	0.9	0.8	4
Boron	5.0	10.3	15.1	10.9	9.8	9.7	7.5	7.2	12.6	13.5	120
Cadmium	0.5	nd	nd	0.7	nd	0.5	nd	nd	nd	nd	1.2
Chromium VI	0.2	-	1.5	nd	0.7	nd	0.7	0.6	nd	0.3	8
Chromium	5.0	27.8	33.6	29.2	28.4	22.1	27.3	16.0	38.8	28.8	160
Cobalt	1.0	15.1	15.2	14.4	14.0	9.7	12.6	6.2	13.0	14.0	22
Copper	5.0	43.2	30.0	49.3	34.7	55.2	28.1	19.5	33.3	31.3	140
Lead	1.0	44.8	50.5	**143**	13.6	**166**	14.2	23.6	40.0	13.9	120
Mercury	0.1	-	nd	0.2	nd	0.1	nd	nd	nd	nd	0.27
Molybdenum	1.0	3.9	2.7	4.4	3.2	3.1	2.9	2.3	2.6	2.8	6.9
Nickel	5.0	52.7	48.6	43.1	48.7	28.2	33.9	18.2	41.7	50.7	100
Selenium	1.0	nd	1.4	1.6	nd	1.2	nd	nd	nd	nd	2.4
Silver	0.3	nd	nd	0.5	nd	nd	nd	nd	nd	nd	20
Thallium	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	1
Uranium	1.0	2.1	1.4	1.6	1.4	1.3	1.6	nd	1.3	1.3	23
Vanadium	10.0	34.8	43.2	34.1	34.9	27.1	32.8	19.0	47.7	37.7	86
Zinc	20.0	62.8	54.1	182	42.8	174	38.9	42.0	64.3	40.1	340

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

The concentration of lead detected in Samples BH2-24-SS2 and BH3-24-SS2 are both in excess of the selected MECP Table 7 Coarse-Grained Residential Soil Standards. It should be noted for context that these two samples were both obtained from a lower layer of fill material, situated underneath the pavement structure across the Phase II Property. For vertical delineation purposes, the underlying native soil samples were tested at these two borehole locations which returned lead concentrations in compliance with the Standards. As a result, the lead contamination appears to be contained within this layer of fill material and has not migrated downwards into the underlying native soils.

All remaining metal parameter concentrations detected in the soil samples analyzed are in compliance with the selected MECP Table 7 Coarse-Grained Residential Soil Standards.

Table 8
Analytical Test Results – Soil
PAHs

Parameter	MDL (µg/g)	Soil Samples (ug/g)								MECP Table 7 Coarse-Grained Residential Soil Standards (µg/g)
		April 1, 2024								
		BH1-24-SS2	BH2-24-SS2	BH2-24-SS3	BH3-24-SS2	BH3-24-SS3	BH4-24-SS2	BH5-24-SS2	BH8-24-SS2	
		Sample Depth (m bgs)								
		0.76-1.37 m	0.76-1.37 m	1.52-2.13 m	0.76-1.37 m	1.52-2.13 m	0.76-1.37 m	0.76-1.37 m	0.76-1.37 m	
Acenaphthene	0.02	nd	1.57	0.04	0.06	nd	0.07	0.02	nd	7.9
Acenaphthylene	0.02	nd	nd	nd	0.08	nd	0.04	0.09	nd	0.15
Anthracene	0.02	nd	**5.20**	0.16	0.23	nd	0.24	0.09	nd	0.67
Benzo[a]anthracene	0.02	nd	**7.04**	0.23	**0.57**	nd	0.47	0.26	nd	0.5
Benzo[a]pyrene	0.02	nd	**5.31**	0.16	**0.42**	nd	**0.36**	0.25	nd	0.3
Benzo[b]fluoranthene	0.02	nd	**4.88**	0.16	0.46	nd	0.36	0.19	nd	0.78
Benzo[g,h,i]perylene	0.02	nd	2.70	0.10	0.25	nd	0.23	0.14	nd	6.6
Benzo[k]fluoranthene	0.02	nd	**2.95**	0.10	0.29	nd	0.22	0.10	nd	0.78
Chrysene	0.02	nd	6.44	0.26	0.55	nd	0.40	0.28	nd	7
Dibenzo[a,h]anthracene	0.02	nd	**0.81**	0.02	0.07	nd	0.06	0.03	nd	0.1
Fluoranthene	0.02	nd	**20.7**	0.66	**1.30**	nd	**1.22**	0.62	0.02	0.69
Fluorene	0.02	nd	1.95	0.04	0.06	nd	0.10	0.03	nd	62
Indeno [1,2,3-cd] pyrene	0.02	nd	**2.47**	0.08	0.24	nd	0.21	0.11	nd	0.38
1-Methylnaphthalene	0.02	nd	nd	nd	nd	nd	nd	nd	nd	0.99
2-Methylnaphthalene	0.02	nd	nd	nd	nd	nd	0.03	nd	nd	0.99
Methylnaphthalene (1&2)	0.04	nd	nd	nd	nd	nd	0.05	nd	nd	0.99
Naphthalene	0.01	nd	0.51	0.01	0.02	nd	0.06	nd	nd	0.6
Phenanthrene	0.02	nd	**17.2**	0.44	0.81	nd	0.85	0.21	0.02	6.2
Pyrene	0.02	nd	16.2	0.51	1.13	nd	1.01	0.57	nd	78

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

The concentrations of several PAH parameters detected in Samples BH2-24-SS2, BH3-24-SS2, and BH4-24-SS2 are in excess of the selected MECP Table 7 Coarse-Grained Residential Soil Standards. It should be noted for context that these three samples were all obtained from a lower layer of fill material, situated underneath the pavement structure across the Phase II Property. For vertical delineation purposes, the underlying native soil samples were tested at two of these borehole locations which returned PAH concentrations in compliance with the Standards. As a result, the PAH contamination appears to be contained within this layer of fill material and has not migrated downwards into the underlying native soils.

All remaining PAH parameter concentrations detected in the soil samples analyzed are in compliance with the selected MECP Table 7 Coarse-Grained Residential Soil Standards.

Table 9
Analytical Test Results – Soil
Inorganics

Parameter	MDL	Soil Samples (ug/g)				MECP Table 7 Coarse-Grained Residential Soil Standards
		April 1, 2024				
		BH1-24-SS2	BH2-24-SS2	BH3-24-SS2	BH4-24-SS2	
		Sample Depth (m bgs)				
		0.76-1.37 m	0.76-1.37 m	0.76-1.37 m	0.76-1.37 m	
EC	5.0 µS/cm	**1,940**	**6,060**	**5,440**	**3,450**	700 µS/cm
SAR	0.01	**11.1**	**7.70**	**7.14**	**16.8**	5.00
pH	0.05 pH units	7.51	-	-	-	5.00 – 11.00 pH units

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

The EC and SAR levels detected in Samples BH1-24-SS2, BH2-24-SS2, BH3-24-SS2, and BH4-24-SS2 are in excess of the selected MECP Table 7 Coarse-Grained Residential Soil Standards.

It should be noted that these EC and SAR exceedances are considered to be the result of a substance which has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, which according to Section 49.1 of O. Reg. 153/04, the standards for these parameters are considered to have been met. As a result, these exceedances are not considered to represent a contaminant issue to the Phase II Property.

Table 10
Maximum Concentrations – Soil

Parameter	Maximum Concentration (µg/g)	Sample ID	Depth Interval (m BGS)
Ethylbenzene	0.06	BH7-22-SS2	0.76 – 1.37 m
Toluene	0.25	BH7-22-SS2	0.76 – 1.37 m
Xylenes	1.24	BH7-22-SS2	0.76 – 1.37 m
PHCs F_1	11	BH7-22-SS2	0.76 – 1.37 m
PHCs F_2	70	BH7-22-SS2	0.76 – 1.37 m
PHCs F_3	155	BH2-24-SS2	0.76 – 1.37 m
PHCs F_4	64	BH3-24-SS2	0.76 – 1.37 m
Arsenic	12.5	BH2-24-SS2	0.76 – 1.37 m
Barium	216	BH2-24-SS2	0.76 – 1.37 m
Beryllium	1.2	BH1-24-SS2	0.76 – 1.37 m
Boron	15.1	BH1-24-SS2	0.76 – 1.37 m
Cadmium	0.7	BH2-24-SS2	0.76 – 1.37 m
Chromium VI	1.5	BH1-24-SS2	0.76 – 1.37 m
Chromium	38.8	BH5-24-SS2	0.76 – 1.37 m
Cobalt	15.2	BH1-24-SS2	0.76 – 1.37 m

Notes:
- **Bold and Underlined** – value exceeds selected MECP standards

Table 10 (Continued)
Maximum Concentrations – Soil

Parameter	Maximum Concentration (µg/g)	Sample ID	Depth Interval (m BGS)
Copper	55.2	BH3-24-SS2	0.76 – 1.37 m
Lead	**166**	BH3-24-SS2	0.76 – 1.37 m
Mercury	0.2	BH2-24-SS2	0.76 – 1.37 m
Molybdenum	4.4	BH2-24-SS2	0.76 – 1.37 m
Nickel	52.7	BH3-22-SS2	0.76 – 1.37 m
Selenium	1.6	BH2-24-SS2	0.76 – 1.37 m
Silver	0.5	BH2-24-SS2	0.76 – 1.37 m
Uranium	2.1	BH3-22-SS2	0.76 – 1.37 m
Vanadium	47.7	BH5-24-SS2	0.76 – 1.37 m
Zinc	182	BH2-24-SS2	0.76 – 1.37 m
Acenaphthene	1.57	BH2-24-SS2	0.76 – 1.37 m
Acenaphthylene	0.09	BH5-24-SS2	0.76 – 1.37 m
Anthracene	**5.20**	BH2-24-SS2	0.76 – 1.37 m
Benzo[a]anthracene	**7.04**	BH2-24-SS2	0.76 – 1.37 m
Benzo[a]pyrene	**5.31**	BH2-24-SS2	0.76 – 1.37 m
Benzo[b]fluoranthene	**4.88**	BH2-24-SS2	0.76 – 1.37 m
Benzo[g,h,i]perylene	2.70	BH2-24-SS2	0.76 – 1.37 m
Benzo[k]fluoranthene	**2.95**	BH2-24-SS2	0.76 – 1.37 m
Chrysene	6.44	BH2-24-SS2	0.76 – 1.37 m
Dibenzo[a,h]anthracene	**0.81**	BH2-24-SS2	0.76 – 1.37 m
Fluoranthene	**20.7**	BH2-24-SS2	0.76 – 1.37 m
Fluorene	1.95	BH2-24-SS2	0.76 – 1.37 m
Indeno [1,2,3-cd] pyrene	**2.47**	BH2-24-SS2	0.76 – 1.37 m
2-Methylnaphthalene	0.03	BH4-24-SS2	0.76 – 1.37 m
Methylnaphthalene (1&2)	0.05	BH4-24-SS2	0.76 – 1.37 m
Naphthalene	0.51	BH2-24-SS2	0.76 – 1.37 m
Phenanthrene	**17.2**	BH2-24-SS2	0.76 – 1.37 m
Pyrene	16.2	BH2-24-SS2	0.76 – 1.37 m
EC	**6,060**	BH2-24-SS2	0.76 – 1.37 m
SAR	**16.8**	BH4-24-SS2	0.76 – 1.37 m
pH	7.51	BH1-24-SS2	0.76 – 1.37 m

Notes:
- **Bold and Underlined** – value exceeds selected MECP standards

All other parameter concentrations analyzed were below the laboratory detection limits. The laboratory certificates of analysis are provided in Appendix 1.

5.6 Groundwater Quality

As part of this assessment, three groundwater samples were submitted for laboratory analysis of VOCs, PHCs (F_1-F_4), and PAH parameters. It should be noted that the historical groundwater testing data obtained from a previously installed monitoring well (BH3-22) was also utilized as part of this assessment.

The results of the analytical testing are presented below in Tables 11 to 13, as well as on the laboratory certificates of analysis included in Appendix 1.

Table 11
Analytical Test Results – Groundwater
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/L)	Groundwater Samples (ug/L)				MECP Table 7 Non-Potable Groundwater Standards (µg/L)
		April 19, 2022	April 12, 2024			
		BH3-22-GW1	BH3-22-GW2	BH1-24-GW1	BH2-24-GW1	
		Screening Interval (m bgs)				
		3.07-6.07 m		3.12-6.12 m	2.97-5.97 m	
Acetone	5.0	nd	nd	nd	nd	100,000
Benzene	0.5	nd	nd	nd	nd	0.5
Bromodichloromethane	0.5	nd	nd	nd	nd	67,000
Bromoform	0.5	nd	nd	nd	nd	5
Bromomethane	0.5	nd	nd	nd	nd	0.89
Carbon Tetrachloride	0.2	nd	nd	nd	nd	0.2
Chlorobenzene	0.5	nd	nd	nd	nd	140
Chloroform	0.5	nd	nd	nd	nd	2
Dibromochloromethane	0.5	nd	nd	nd	nd	65,000
Dichlorodifluoromethane	1.0	nd	nd	nd	nd	3,500
1,2-Dichlorobenzene	0.5	nd	nd	nd	nd	150
1,3-Dichlorobenzene	0.5	nd	nd	nd	nd	7,600
1,4-Dichlorobenzene	0.5	nd	nd	nd	nd	0.5
1,1-Dichloroethane	0.5	nd	nd	nd	nd	11
1,2-Dichloroethane	0.5	nd	nd	nd	nd	0.5
1,1-Dichloroethylene	0.5	nd	nd	nd	nd	0.5
cis-1,2-Dichloroethylene	0.5	nd	nd	nd	nd	1.6
trans-1,2-Dichloroethylene	0.5	nd	nd	nd	nd	1.6
1,2-Dichloropropane	0.5	nd	nd	nd	nd	0.58
1,3-Dichloropropene	0.5	nd	nd	nd	nd	0.5
Ethylbenzene	0.5	nd	nd	nd	nd	54
Ethylene Dibromide	0.2	nd	nd	nd	nd	0.2
Hexane	1.0	nd	nd	nd	nd	5
Methyl Ethyl Ketone	5.0	nd	nd	nd	nd	21,000
Methyl Isobutyl Ketone	5.0	nd	nd	nd	nd	5,200
Methyl tert-butyl ether	2.0	nd	nd	nd	nd	15
Methylene Chloride	5.0	nd	nd	nd	nd	26
Styrene	0.5	nd	nd	nd	nd	43
1,1,1,2-Tetrachloroethane	0.5	nd	nd	nd	nd	1.1
1,1,2,2-Tetrachloroethane	0.5	nd	nd	nd	nd	0.5
Tetrachloroethylene	0.5	nd	nd	nd	nd	0.5
Toluene	0.5	nd	nd	nd	nd	320
1,1,1-Trichloroethane	0.5	nd	nd	nd	nd	23
1,1,2-Trichloroethane	0.5	nd	nd	nd	nd	0.5
Trichloroethylene	0.5	nd	nd	nd	nd	0.5
Trichlorofluoromethane	1.0	nd	nd	nd	nd	2,000
Vinyl Chloride	0.5	nd	nd	nd	nd	0.5
Xylenes	0.5	nd	nd	nd	nd	72

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

No VOC parameter concentrations were detected above the laboratory method detection limits in any of the groundwater samples analyzed. The results are in compliance with the selected MECP Table 7 Non-Potable Groundwater Standards.

Table 12
Analytical Test Results – Groundwater
PHCs (F_1-F_4)

Parameter	MDL (µg/L)	Groundwater Samples (ug/L)				MECP Table 7 Non-Potable Groundwater Standards (µg/L)
		April 19, 2022	April 12, 2024			
		BH3-22-GW1	BH3-22-GW2	BH1-24-GW1	BH2-24-GW1	
		Screening Interval (m bgs)				
		3.07-6.07 m		3.12-6.12 m	2.97-5.97 m	
PHCs F_1	25	nd	nd	nd	nd	420
PHCs F_2	100	nd	nd	nd	nd	150
PHCs F_3	100	nd	nd	nd	nd	500
PHCs F_4	100	nd	nd	nd	nd	500

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

No PHC parameter concentrations were detected above the laboratory method detection limits in any of the groundwater samples analyzed. The results are in compliance with the selected MECP Table 7 Non-Potable Groundwater Standards.

Table 13
Analytical Test Results – Groundwater
PAHs

Parameter	MDL (µg/L)	Groundwater Samples (ug/L)			MECP Table 7 Non-Potable Groundwater Standards (µg/L)
		April 12, 2024			
		BH3-22-GW2	BH1-24-GW1	BH2-24-GW1	
		Screening Interval (m bgs)			
		3.07-6.07 m	3.12-6.12 m	2.97-5.97 m	
Acenaphthene	0.05	nd	nd	nd	17
Acenaphthylene	0.05	nd	nd	nd	1
Anthracene	0.01	nd	nd	nd	1
Benzo[a]anthracene	0.01	nd	nd	nd	1.8
Benzo[a]pyrene	0.01	nd	nd	nd	0.81
Benzo[b]fluoranthene	0.05	nd	nd	nd	0.75
Benzo[g,h,i]perylene	0.05	nd	nd	nd	0.2
Benzo[k]fluoranthene	0.05	nd	nd	nd	0.4
Chrysene	0.05	nd	nd	nd	0.7
Dibenzo[a,h]anthracene	0.05	nd	nd	nd	0.4
Fluoranthene	0.01	nd	nd	nd	44
Fluorene	0.05	nd	nd	nd	290
Indeno [1,2,3-cd] pyrene	0.05	nd	nd	nd	0.2
1-Methylnaphthalene	0.05	nd	nd	nd	1,500
2-Methylnaphthalene	0.05	nd	nd	nd	1,500
Methylnaphthalene (1&2)	0.10	nd	nd	nd	1,500
Naphthalene	0.05	nd	nd	nd	7
Phenanthrene	0.05	nd	nd	nd	380
Pyrene	0.01	nd	nd	nd	5.7

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and Underlined** – value exceeds selected MECP standards

No PAH parameter concentrations were detected above the laboratory method detection limits in any of the groundwater samples analyzed. The results are in compliance with the selected MECP Table 7 Non-Potable Groundwater Standards.

5.7 Quality Assurance and Quality Control Results

All samples submitted as part of this Phase II ESA were handled in accordance with the analytical protocols with respect to holding time, preservation method, storage requirement, and container type.

As per Subsection 47(3) of O. Reg. 153/04, as amended by the Environmental Protection Act, the certificates of analysis have been received for each sample submitted for laboratory analysis and have been appended to this report.

As per the Sampling and Analysis Plan, a duplicate soil sample was obtained from sample BH1-24-SS2 and submitted for laboratory analysis of BTEX, PHC, and metal parameters. The relative percent difference (RPD) calculations for the original and duplicate samples are provided below in Table 14.

Table 14
QA/QC Calculations – Soil

Parameter	MDL (µg/g)	BH1-24-SS2	DUP1	RPD (%)	QA/QC Result (Target: <20% RPD)
Antimony	1.0	nd	nd	0	Meets Target
Arsenic	1.0	6.9	3.3	70.6	Does Not Meet Target
Barium	1.0	111	121	8.6	Meets Target
Beryllium	0.5	1.2	0.8	40	Does Not Meet Target
Boron	5.0	15.1	9.6	44.5	Does Not Meet Target
Cadmium	0.5	nd	nd	0	Meets Target
Chromium	5.0	33.6	27.7	19.2	Meets Target
Cobalt	1.0	15.2	8.1	60.9	Does Not Meet Target
Copper	5.0	30.0	17.0	55.3	Does Not Meet Target
Lead	1.0	50.5	115	77.9	Does Not Meet Target
Molybdenum	1.0	2.7	nd	N/A	N/A
Nickel	5.0	48.6	29.1	50.2	Does Not Meet Target
Selenium	1.0	1.4	nd	N/A	N/A
Silver	0.3	nd	nd	0	Meets Target
Thallium	1.0	nd	nd	0	Meets Target
Uranium	1.0	1.4	1.0	33.3	Does Not Meet Target
Vanadium	10.0	43.2	30.4	34.8	Does Not Meet Target
Zinc	20.0	54.1	58.5	7.8	Meets Target
Benzene	0.02	nd	nd	0	Meets Target
Ethylbenzene	0.05	nd	nd	0	Meets Target
Toluene	0.05	nd	nd	0	Meets Target
Xylenes	0.05	nd	nd	0	Meets Target
PHCs F_1	7	nd	nd	0	Meets Target
PHCs F_2	4	nd	10	N/A	Meets Target
PHCs F_3	8	40	155	117.9	Does Not Meet Target
PHCs F_4	6	50	148	99	Meets Target

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

The RPD calculated for a majority of the parameters fell within of the acceptable range of 20%, with a fair number of exceptions. These discrepancies are likely attributed to the variability between the low concentrations of certain parameters detected in the samples, as well as the non-homogeneous nature of the fill material from where both samples were sourced. Given that there is a similarity in the list of parameters detected in both the original and duplicate sample, and that both samples comply with the site standards, the data quality objectives outlined in the Sampling and Analysis Plan, appended to this report, are considered to have been met.

Similarly, a duplicate groundwater sample was obtained from sample BH3-22-GW2 and submitted for laboratory analysis of VOC parameters. No VOC parameters were detected above the laboratory method detection limits in either the original or the duplicate sample, and as such, the results are considered to meet the data quality objectives outlined in the Sampling and Analysis Plan, appended to this report.

A trip blank was also acquired from the laboratory and transported to and from the Phase II Property along side the obtained groundwater samples. The trip blank was then submitted for analytical testing of VOC parameters to verify the that the integrity of the shipping and handling procedures undertaken during this assessment had not been compromised and that no cross-contamination from outside sources have had the potential to influence the obtained groundwater samples. No VOC parameters were detected within the trip blank sample, and as such, the results are considered to meet the data quality objectives outlined in the Sampling and Analysis Plan, appended to this report.

Based on the results of the QA/QC analysis, the quality of the field data collected during this Phase II ESA is considered to be sufficient to meet the overall objectives of this assessment.

5.8 Phase II Conceptual Site Model

The following section has been prepared in accordance with the requirements of O. Reg. 153/04 amended by the Environmental Protection Act. Conclusions and recommendations are discussed in a subsequent section.

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

As described in Section 7.1 of the Phase I ESA report, as well as Section 2.2 of this report, the following PCAs, as defined by Table 2 of O. Reg. 153/04, are considered to result in APECs on the Phase II Property:

Table 15
Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of APEC on Phase I Property	Potentially Contaminating Activity (Table 2 – O. Reg. 153/04)	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC #1 Fill Material of Unknown Quality	Entirety of Phase II Property	*"Item 30: Importation of Fill Material of Unknown Quality"*	On-Site	BTEX PHCs PAHs Metals	Soil
APEC #2 Application of Road Salt During Snow/Ice Conditions	Entirety of Phase II Property	*"No Item Number: Application of Road Salt During Snow and Ice Conditions"*	On-Site	EC SAR	Soil
APEC #3 Former Dry Cleaners	Southern Portion of Phase II Property	*"Item 37: Operation of Dry Cleaning Equipment (Where Chemicals Are Used)"*	Off-Site (20 m South)	VOCs	Groundwater

Contaminants of Potential Concern (CPCs)

The contaminants of potential concern (CPCs) associated with the aforementioned APECs are considered to be:

- ❒ Volatile Organic Compounds (VOCs);
- ❒ Petroleum Hydrocarbons, fractions 1 – 4 (PHCs F_1-F_4);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);
- ❒ Metals (including Arsenic [As], Antimony [Sb], and Selenium [Se])
- ❒ Mercury;
- ❒ Hexavalent Chromium;
- ❒ Electrical Conductivity (EC);

These CPCs have the potential to be present in the soil matrix and/or the groundwater situated beneath the Phase II Property.

Subsurface Structures and Utilities

Underground service locates were completed prior to the subsurface investigation, which identified a buried high-voltage electrical line transecting the Phase II Property in a northeast-southwest direction.

Physical Setting

Site Stratigraphy

The stratigraphy of the Phase II Property generally consists of:

- ❒ Pavement structure (asphaltic concrete over brown silty sand with crushed stone and gravel); encountered at ground level and extending to a maximum depth of approximately 0.69 m below ground surface.
- ❒ Fill material (brown silty clay with sand, trace gravel, and brick); extending to depths ranging from approximately 1.07 m to 1.83 m below ground surface.
- ❒ Stiff, brown silty clay with sand and trace gravel; extending to depths ranging from approximately 1.63 m to 2.13 m below ground surface.
- ❒ Poor quality shale bedrock, extending to a depth of at least 6.12 m below ground surface (bottom of deepest borehole).

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is provided in the Soil Profile and Test Data Sheets in Appendix 1.

Hydrogeological Characteristics

The groundwater beneath the Phase II Property was encountered within the shale bedrock unit at depths ranging from approximately 2.39 m to 2.55 m below the existing ground surface.

Based on the measured groundwater levels, the groundwater was calculated to flow in a northeasterly direction.

Approximate Depth to Bedrock

Bedrock, consisting of poor quality shale, was encountered in boreholes BH3-22, BH1-24, and BH2-24 at depths ranging from approximately 1.73 m to 2.03 m below ground surface. Practical refusal to augering on the inferred bedrock surface was measured in boreholes BH7-22 and BH3-24 to BH8-24 at depths ranging from approximately 1.63 m to 2.13 m below ground surface.

Approximate Depth to Water Table

The depth to the water table is approximately 2.39 m to 2.55 m below the existing ground surface.

Sections 41 and 43.1 of Ontario Regulation 153/04

Section 41 of the Regulation does not apply to the Phase II Property, as there are no bodies of water or areas of natural significance located on or within 30 m of the Phase II Property. The Phase II Property is therefore not considered to be environmentally sensitive.

Section 43.1 of the Regulation is considered to apply to the Phase II Property, since the bedrock is situated at depths less than 2 m below ground surface, and thus is considered to be a shallow soil property.

Existing Buildings and Structures

The Phase II Property is currently vacant and consists of an asphalt-covered vehicular parking lot for private vehicles.

Environmental Condition

Areas Where Contaminants are Present

Based on the analytical test results obtained during this assessment, the layer of soil/fill material found underneath the pavement structure is contaminated with lead and multiple PAH parameters. This impacted layer of fill material, approximately 1 meter in thickness, appears to be prevalent across the majority of the Phase II Property area and was encountered within the depth interval ranging from approximately 0.6 m to 1.8 m below the existing ground surface. For vertical delineation purposes, the underlying native soil was also tested for these contaminant parameters, the results of which returned concentrations in compliance with the site standards. As a result, the contamination appears to be contained solely within this layer of fill material and has not migrated downwards into the underlying native soil.

The groundwater beneath the Phase II Property is not considered to be contaminated.

Types of Contaminants

The following contaminants were detected on the Phase II Property at concentrations exceeding the selected MECP Table 7 Coarse-Grained Residential Soil Standards:

Metals

- ❑ Lead

Polycyclic Aromatic Hydrocarbon (PAHs)

- ❑ Anthracene
- ❑ Benzo[a]anthracene
- ❑ Benzo[a]pyrene
- ❑ Benzo[b]fluoranthene
- ❑ Benzo[k]fluoranthene
- ❑ Dibenzo[a,h]anthracene
- ❑ Fluoranthene
- ❑ Indeno[1,2,3-cd]pyrene
- ❑ Phenanthrene

Inorganic Parameters

- ❑ Electrical Conductivity (EC)*
- ❑ Sodium Adsorption Ratio (SAR)*

These contaminants were identified solely within the layer of soil/fill material found underneath the pavement structure across the majority of the Phase II Property.

(*) It should be noted that the elevated levels of EC and SAR detected across the site are considered to be a result of the use of a road salt for de-icing purposes during snow and ice conditions, and as such, are deemed to meet the selected site standards in accordance with Section 49.1 of O. Reg. 153/04.

Contaminated Media

Soil

The layer of soil/fill material found underneath the pavement structure across the majority of the Phase II Property is considered to be contaminated.

Groundwater

The groundwater beneath the Phase II Property is not considered to be contaminated.

What Is Known About Areas Where Contaminants Are Present

Based on what is known about the history of the Phase II Property, the source of the contamination is suspected to have been the result of demolition debris left over from the former residential dwelling, intermixed with imported soil material.

The elevated levels of EC and SAR, though not considered to pose a contaminant issue to the Phase II Property, is considered to be a result of the use of a road salt for de-icing purposes during snow and ice conditions, and as such, is deemed to meet the selected site standards in accordance with Section 49.1 of O. Reg. 153/04.

Distribution and Migration of Contaminants

The impacted layer of fill material appears to be prevalent across the majority of the Phase II Property area and is situated at a depth interval ranging from approximately 0.6 m to 1.8 m below the existing ground surface. Given the suspected source of the contamination, in addition to the low-mobility of the identified contaminants, the vertical delineation from the deeper clean native soil layer, as well as the clean groundwater results, the contamination does not appear to have migrated downwards into the underlying native soils or the water table.

Discharge of Contaminants

Based on the types of contaminants identified on the Phase II Property, as well as their containment within the layer of fill material, the discharge source of the contamination is suspected to have been the result of demolition debris left over from the former residential dwelling, intermixed with imported soil material.

Climatic and Meteorological Conditions

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two (2) ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants via the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally.

Based on the clean native soil results obtained from underneath the impacted layer of fill material, as well as the clean groundwater results, no downward migration of contaminants is suspected to have occurred.

Potential for Vapour Intrusion

Given that the Phase II Property will be redeveloped in the near future, all contaminated soil will be removed from the site during construction activities. As such, there is no anticipated potential for future vapour intrusion at the Phase II Property. Currently, no permanent structures with foundations within the impacted layer of fill material are present on the Phase II Property, and as a result, there is no risk of vapour intrusion occurring on the site.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the property addressed 266 Park Street, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address the potentially contaminating activities (PCAs) that were identified during the Phase I ESA and were considered to result in areas of potential environmental concern (APECs) on the Phase II Property.

The subsurface investigation for this assessment was conducted on April 1, 2024, and consisted of drilling eight boreholes (BH1-24 to BH8-24) throughout the Phase II Property. It should be noted that the data obtained from one previously drilled borehole (BH7-22) and one previously installed monitoring well (BH3-22) were utilized as part of this assessment. Boreholes BH1-24 and BH2-24 were advanced to depths of 6.12 m and 5.97 m below the existing ground surface, respectively, and terminated within the underlying shale bedrock. Upon completion, these two boreholes were instrumented with groundwater monitoring wells in order to access the water table. Boreholes BH3-24 to BH8-24 were advanced to depths ranging from approximately 1.73 m to 2.41 m below the existing ground surface and terminated within an overburden layer of stiff, brown silty clay on practical refusal to augering on the inferred bedrock surface.

In general, the subsurface soil profile encountered at the borehole locations consists of a shallow overburden comprised of a surficial pavement structure (asphaltic concrete over top of granular sub-grade fill), underlain by another layer of fill material (brown silty clay with sand, gravel, and trace brick), over top of native brown silty clay with sand and gravel. Bedrock, consisting of poor quality shale, was confirmed in boreholes BH3-22, BH1-24, and BH2-24 at depths ranging from approximately 1.73 m to 2.03 m below ground surface. The groundwater beneath the Phase II Property was encountered within the shale bedrock at depths ranging from approximately 2.39 m to 2.55 m below the existing ground surface.

Eight soil samples were submitted for laboratory analysis of BTEX, PHCs (F_1-F_4), metals, PAHs, EC, SAR, and/or pH parameters. It should be noted that the historical soil testing data obtained from the two previously drilled boreholes (BH3-22 and BH7-22) was also utilized as part of this assessment. The concentrations of lead and/or multiple PAH parameters detected in the soil/fill material across the majority of the site were found to be in excess of the selected MECP Table 7 Coarse-Grained Residential Soil Standards.

Some elevated levels of EC and SAR were also identified within the soil/fill material layer across the site, however, it should be noted that these exceedances are considered to be a result of the use of a road salt for de-icing purposes during snow and ice conditions, and as such, are deemed to meet the selected site standards in accordance with Section 49.1 of O. Reg. 153/04.

Three groundwater samples were also submitted for laboratory analysis of VOCs, PHCs (F_1-F_4), and PAH parameters. It should be noted that the historical groundwater testing data obtained from a previously installed monitoring well (BH3-22) was also utilized as part of this assessment. All detected parameters were found to comply with the selected MECP Table 7 Non-Potable Groundwater Standards.

Recommendations

Soil

Based on the findings of this assessment, the layer of soil/fill material found underneath the pavement structure across the majority of the Phase II Property is deemed to be contaminated, requiring remedial action. This impacted layer, approximately 1 meter in thickness, appears to be prevalent across the majority of the Phase II Property area and was encountered within the depth interval ranging from approximately 0.6 m to 1.8 m below the existing ground surface.

Given our understanding that the Phase II Property is to be redeveloped in the near future, it is our recommendation that the contaminated soil be remediated in conjunction with site excavation activities. At such a time, the contaminated soil will be excavated from the site and transported to a licensed waste disposal facility. It is recommended that Paterson personnel be present on-site at the time of remedial activities to assist with coordination, directing the excavation and segregation of contaminated soil from clean soils, as well as to fulfill the confirmatory soil sampling requirements in accordance with Table 3 of O. Reg. 153/04.

Prior to the off-site disposal of impacted soil at a licensed waste disposal facility, a leachate analysis of a representative sample of contaminated soil must be conducted in accordance with O. Reg. 347/90 and O. Reg. 558/00.

Based on the soil test results obtained from this assessment, the underlying clean native soils on-site comply with the MECP Table 2.1 Excess Soil Quality Standards (O. Reg. 406/19) for off-site disposal. Additional excess soil testing may be required prior to future site excavation activities.

Monitoring Wells

If the groundwater monitoring wells installed on-site are not going to be used in the future, or will be destroyed during future construction activities, then they must be decommissioned in accordance with O. Reg. 903/90 (Ontario Water Resources Act). Further information can be provided upon request in this regard.

It is our recommendation that the monitoring wells currently be maintained for future sampling purposes, until such a time when future site excavation activities have commenced. The monitoring wells will be registered with the MECP under this regulation.

7.0 STATEMENT OF LIMITATIONS

This Phase II – Environmental Site Assessment report has been prepared in general accordance with O.Reg. 153/04, as amended, and CSA Z769-00. The conclusions presented herein are based on information gathered from a limited sampling and testing program. The test results represent conditions at specific test locations at the time of the field program.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes themselves.

Should any conditions be encountered at the Phase II Property and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Concorde Properties. Permission and notification from Concorde Properties and Paterson Group will be required prior to the release of this report to any other party.

Paterson Group Inc.

Nick Sullivan, B.Sc.

Mark D'Arcy, P.Eng., QP$_{ESA}$

Report Distribution:

- Concorde Properties
- Paterson Group Inc.

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE5651-2 – SITE PLAN

DRAWING PE5651-3 – SURROUNDING LAND USE PLAN

DRAWING PE5651-4 – TEST HOLE LOCATION PLAN

DRAWING PE5651-5 – ANALYTICAL TESTING PLAN – SOIL (METALS)

DRAWING PE5651-5A – CROSS SECTION A-A' – SOIL (METALS)

DRAWING PE5651-5B – CROSS SECTION B-B' – SOIL (METALS)

DRAWING PE5651-6 – ANALYTICAL TESTING PLAN – SOIL (PAHs)

DRAWING PE5651-6A – CROSS SECTION A-A' – SOIL (PAHs)

DRAWING PE5651-6B – CROSS SECTION B-B' – SOIL (PAHs)

DRAWING PE5651-7 – ANALYTICAL TESTING PLAN – SOIL (BTEX, PHCs, EC, SAR)

DRAWING PE5651-7A – CROSS SECTION A-A' – SOIL (BTEX, PHCs, EC, SAR)

DRAWING PE5651-7B – CROSS SECTION B-B' – SOIL (BTEX, PHCs, EC, SAR)

DRAWING PE5651-8 – ANALYTICAL TESTING PLAN – GROUNDWATER

DRAWING PE5651-8A – CROSS SECTION A-A' – GROUNDWATER

DRAWING PE5651-8B – CROSS SECTION B-B' – GROUNDWATER

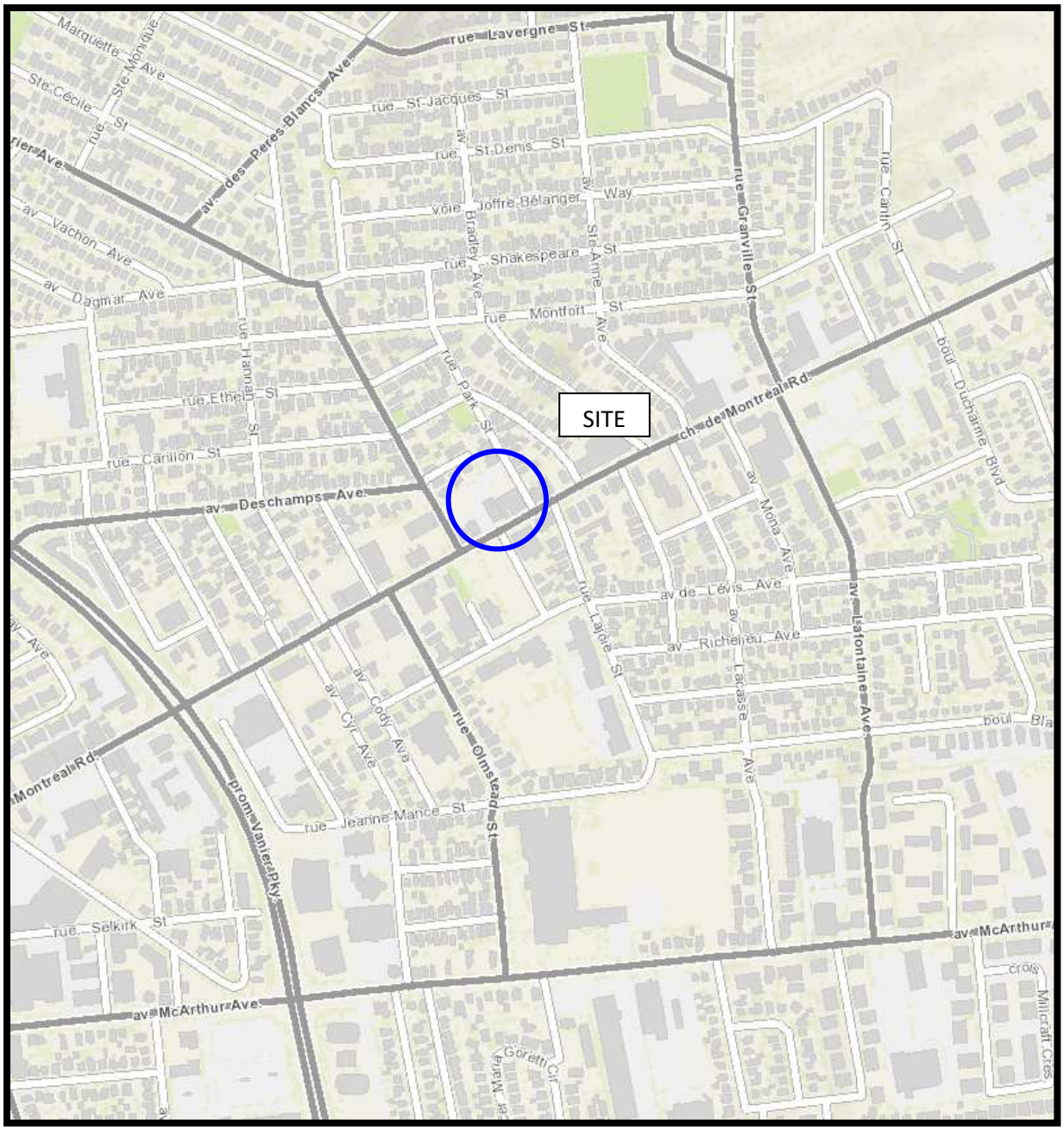
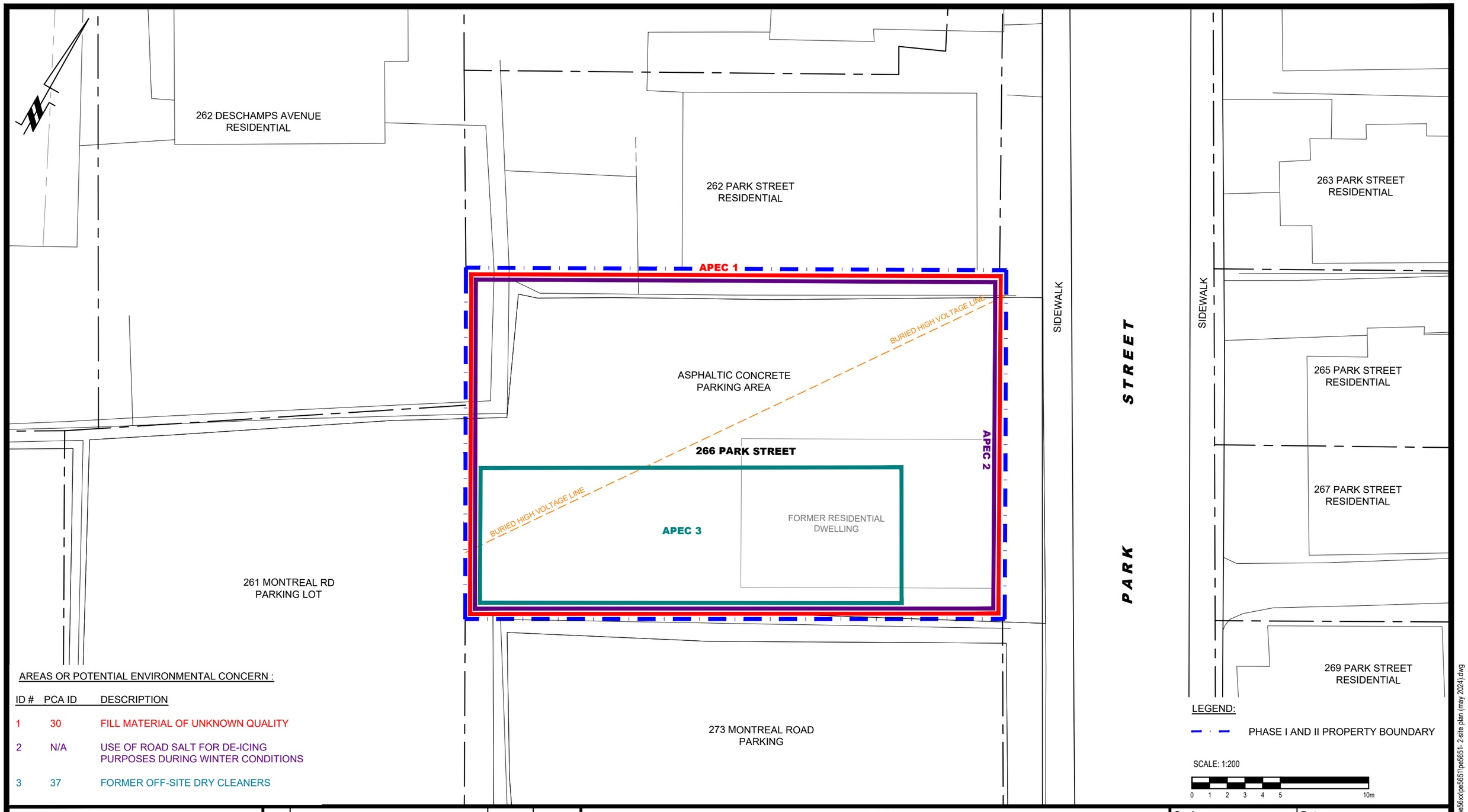


FIGURE 1

KEY PLAN

PATERSON GROUP



AREAS OR POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	DESCRIPTION
1	30	FILL MATERIAL OF UNKNOWN QUALITY
2	N/A	USE OF ROAD SALT FOR DE-ICING PURPOSES DURING WINTER CONDITIONS
3	37	FORMER OFF-SITE DRY CLEANERS

LEGEND:

PHASE I AND II PROPERTY BOUNDARY

SCALE: 1:200

0 1 2 3 4 5 10m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:200	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-2
Approved by: MSD	Revision No.:

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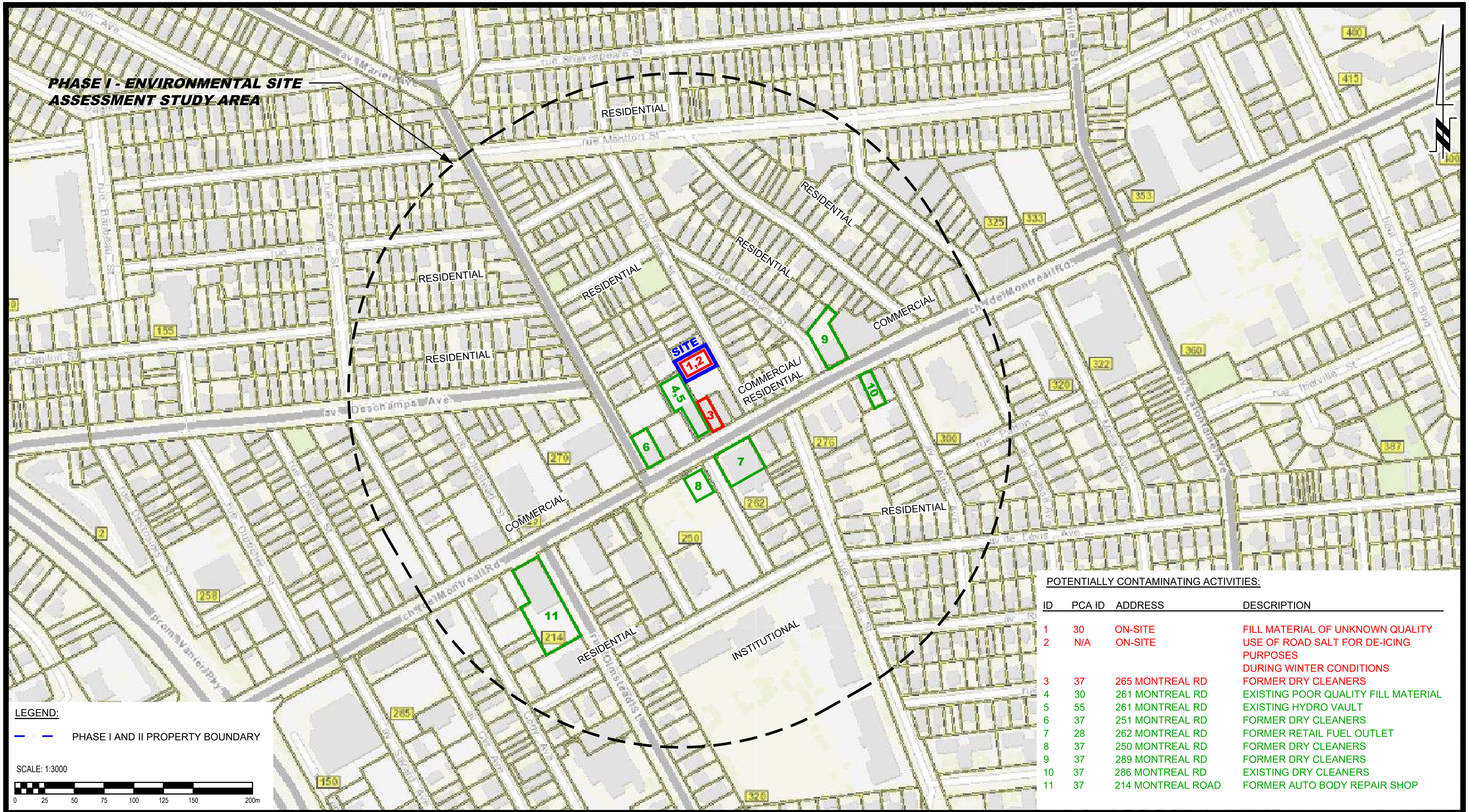

POTENTIALLY CONTAMINATING ACTIVITIES:

ID	PCA ID	ADDRESS	DESCRIPTION
1	30	ON-SITE	FILL MATERIAL OF UNKNOWN QUALITY
2	N/A	ON-SITE	USE OF ROAD SALT FOR DE-ICING PURPOSES DURING WINTER CONDITIONS
3	37	265 MONTREAL RD	FORMER DRY CLEANERS
4	30	261 MONTREAL RD	EXISTING POOR QUALITY FILL MATERIAL
5	55	261 MONTREAL RD	EXISTING HYDRO VAULT
6	37	251 MONTREAL RD	FORMER DRY CLEANERS
7	28	262 MONTREAL RD	FORMER RETAIL FUEL OUTLET
8	37	250 MONTREAL RD	FORMER DRY CLEANERS
9	37	289 MONTREAL RD	FORMER DRY CLEANERS
10	37	286 MONTREAL RD	EXISTING DRY CLEANERS
11	37	214 MONTREAL ROAD	FORMER AUTO BODY REPAIR SHOP

LEGEND:

PHASE I AND II PROPERTY BOUNDARY

SCALE: 1:3000

0 25 50 75 100 125 150 200m

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CONCORDE PROPERTIES

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:3000	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-3
Approved by: MSD	Revision No.:

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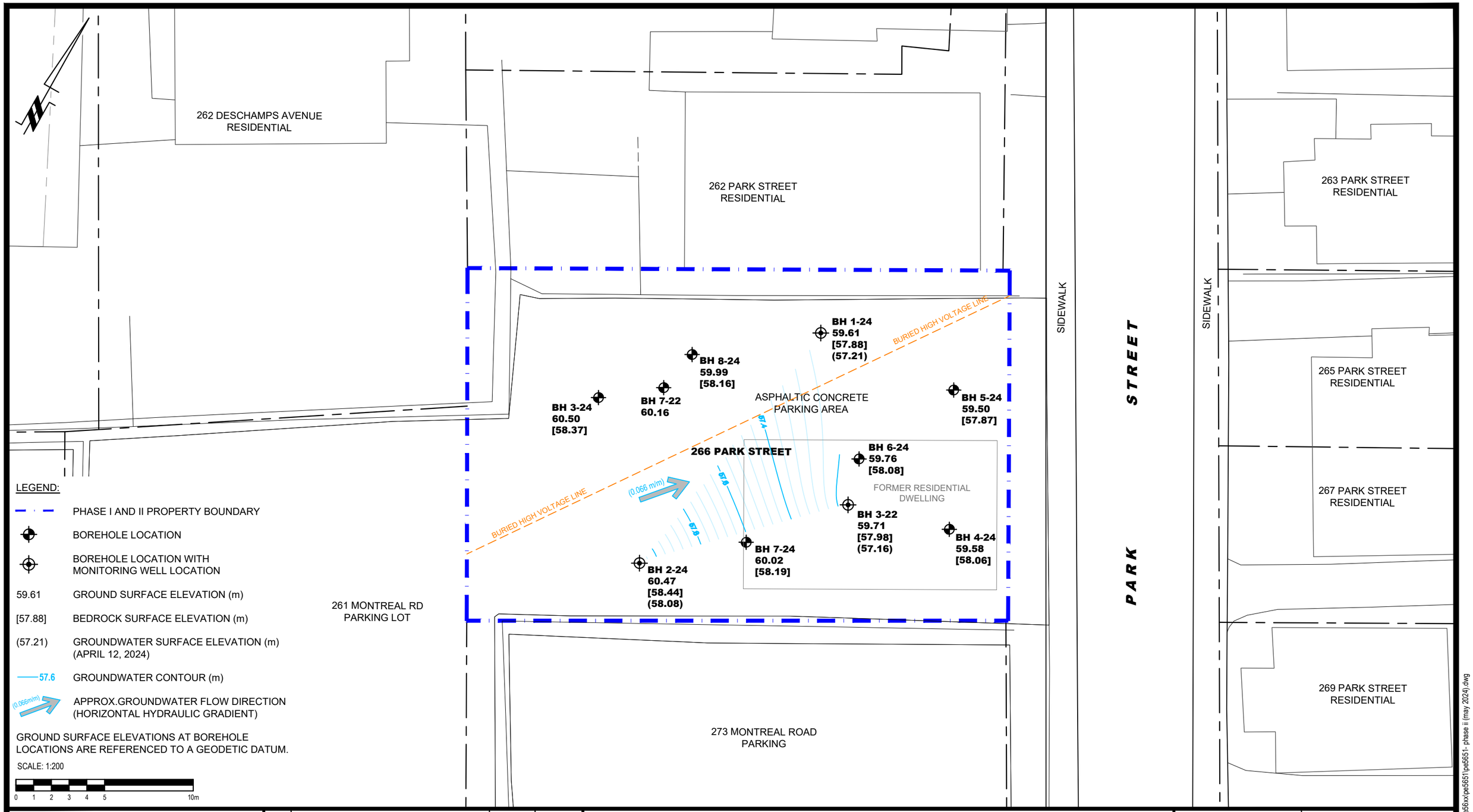
11x17



LEGEND:

- PHASE I AND II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE LOCATION WITH MONITORING WELL LOCATION
- 59.61 GROUND SURFACE ELEVATION (m)
- [57.88] BEDROCK SURFACE ELEVATION (m)
- (57.21) GROUNDWATER SURFACE ELEVATION (m) (APRIL 12, 2024)
- 57.6 GROUNDWATER CONTOUR (m)
- (0.066m/m) APPROX.GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:200

0 1 2 3 4 5 10m

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CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title: **TEST HOLE LOCATION PLAN**

Scale: 1:200	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-4
Approved by: MSD	Revision No.:

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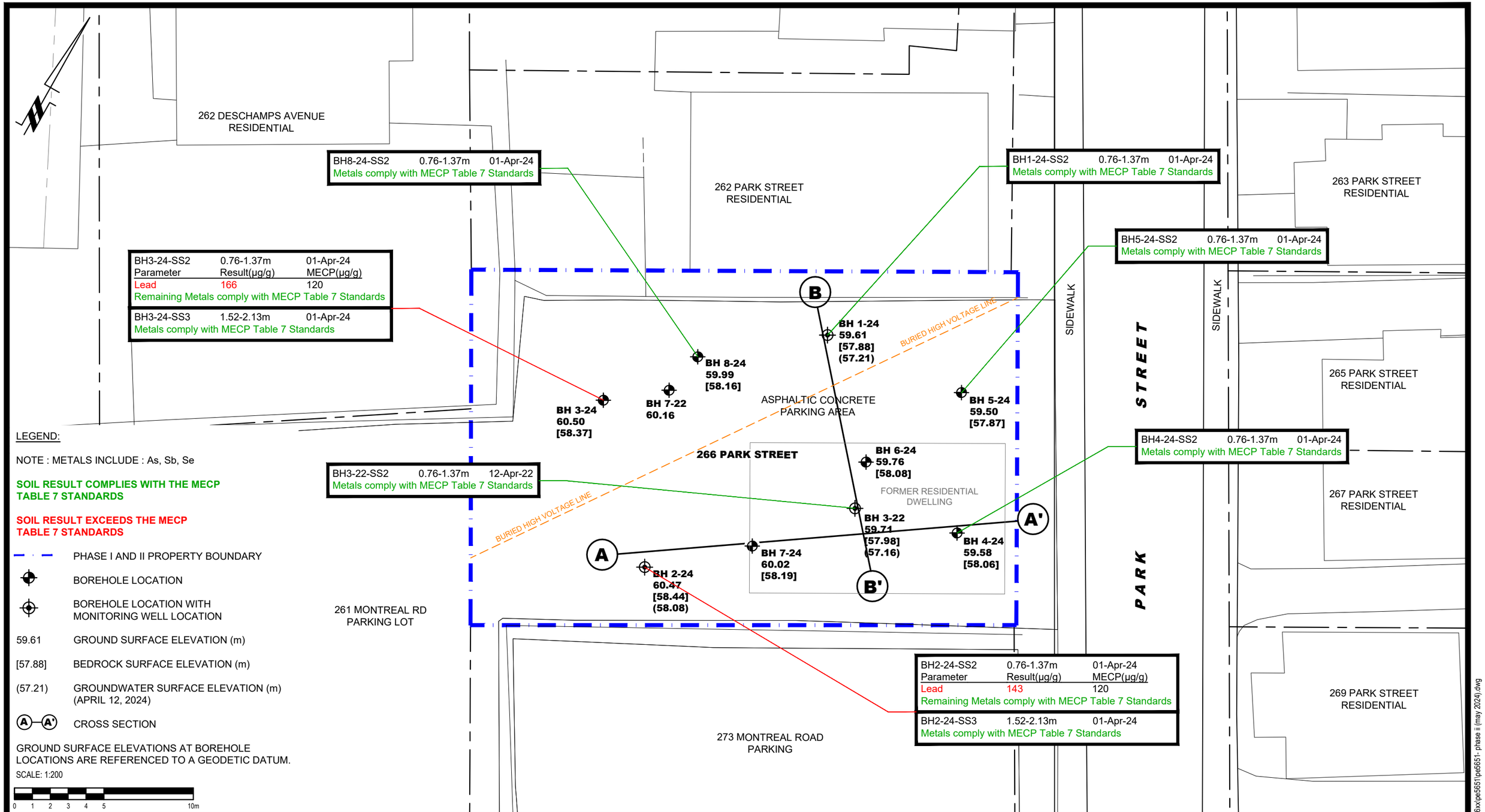

LEGEND:

NOTE : METALS INCLUDE : As, Sb, Se

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS THE MECP TABLE 7 STANDARDS

- PHASE I AND II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE LOCATION WITH MONITORING WELL LOCATION
- 59.61 GROUND SURFACE ELEVATION (m)
- [57.88] BEDROCK SURFACE ELEVATION (m)
- (57.21) GROUNDWATER SURFACE ELEVATION (m) (APRIL 12, 2024)
- A—A' CROSS SECTION

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:200

0 1 2 3 4 5 10m

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CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: ANALYTICAL TESTING PLAN - SOIL (METALS)

Scale: 1:200	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-5
Approved by: MSD	Revision No.:

11x17

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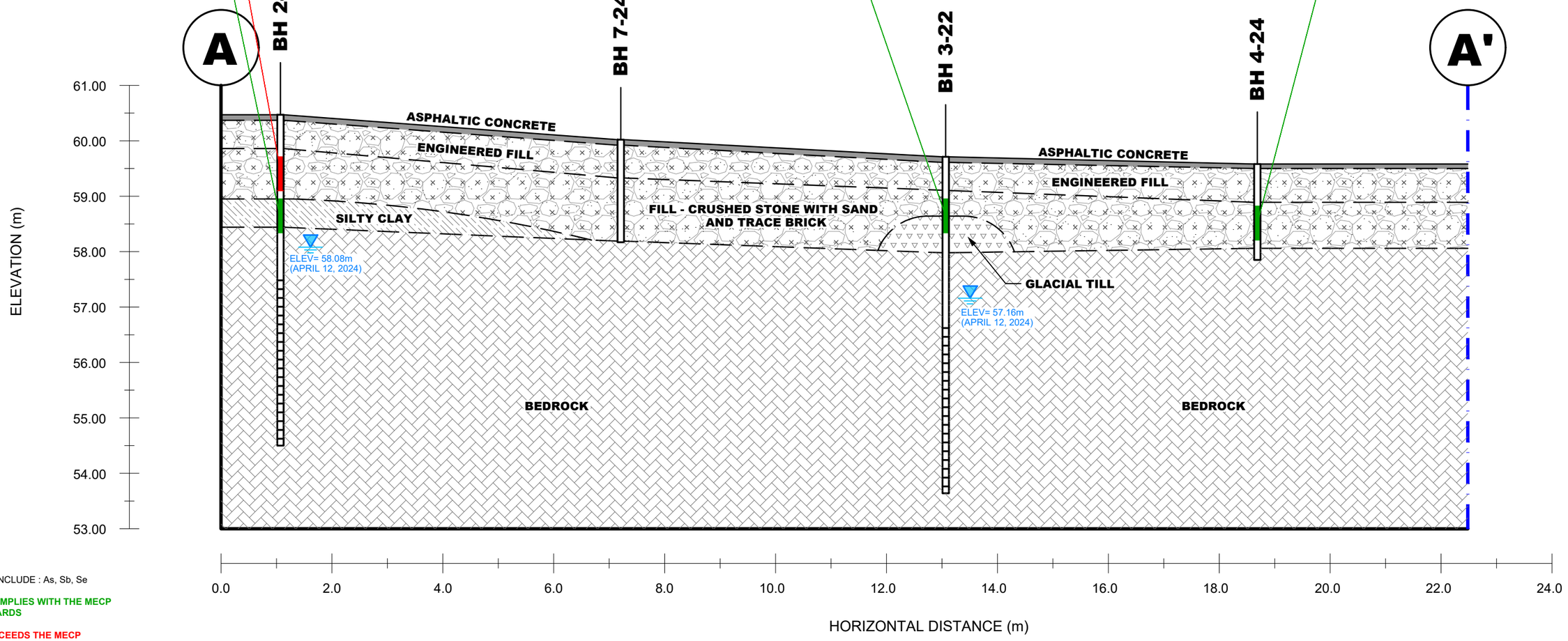
BH2-24-SS2	0.76-1.37m	01-Apr-24
Parameter	Result(µg/g)	MECP(µg/g)
Lead	143	120

Remaining Metals comply with MECP Table 7 Standards

BH2-24-SS3 1.52-2.13m 01-Apr-24
Metals comply with MECP Table 7 Standards

BH3-22-SS2 0.76-1.37m 12-Apr-22
Metals comply with MECP Table 7 Standards

BH4-24-SS2 0.76-1.37m 01-Apr-24
Metals comply with MECP Table 7 Standards



LEGEND:

NOTE : METALS INCLUDE : As, Sb, Se

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

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NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: CROSS SECTION A-A' - SOIL (METALS)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-5A
Approved by: MSD	Revision No.:

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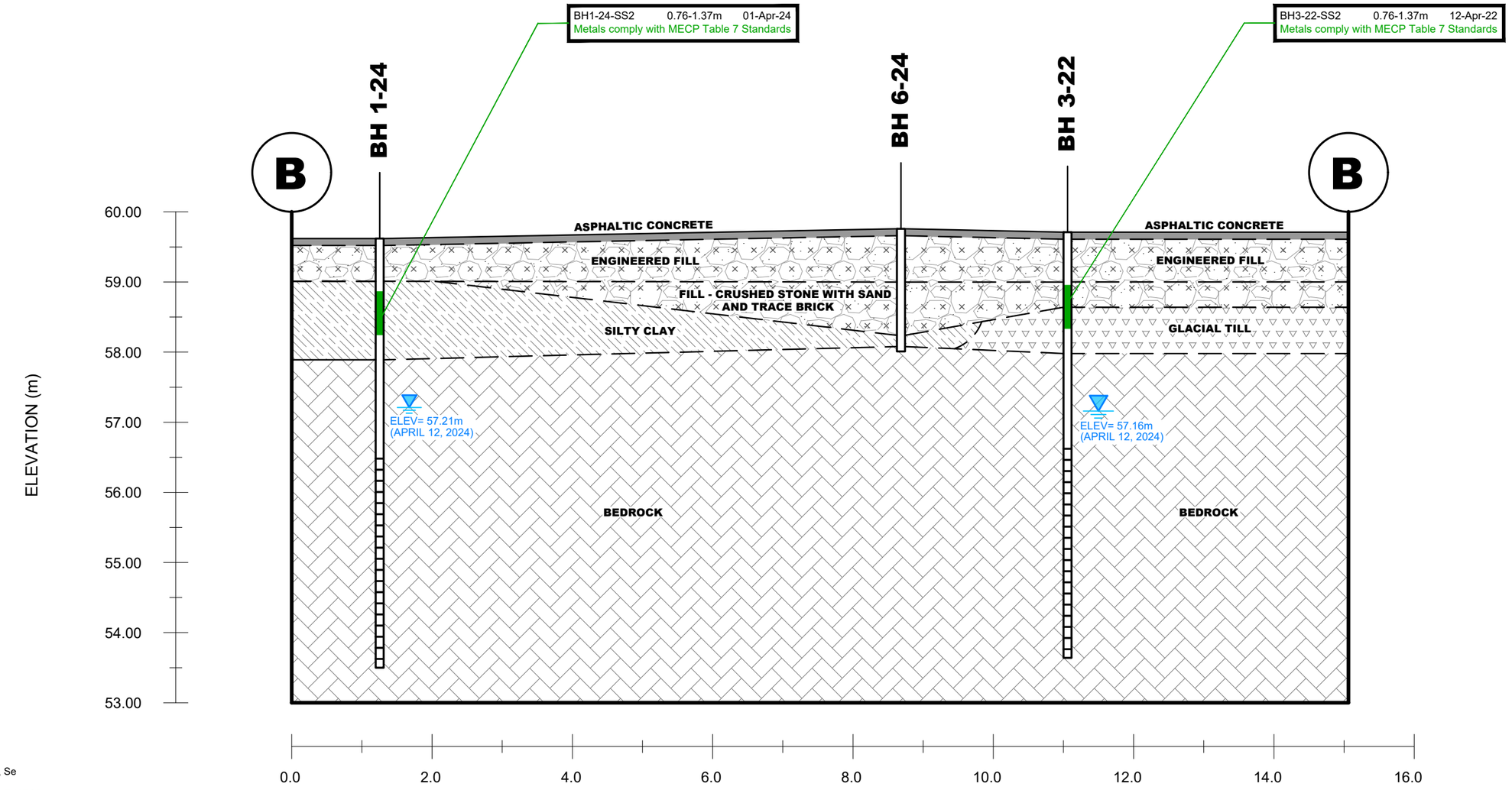

LEGEND:

NOTE : METALS INCLUDE : As, Sb, Se

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

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NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title: CROSS SECTION B-B' - SOIL (METALS)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-5B
Approved by: MSD	Revision No.:

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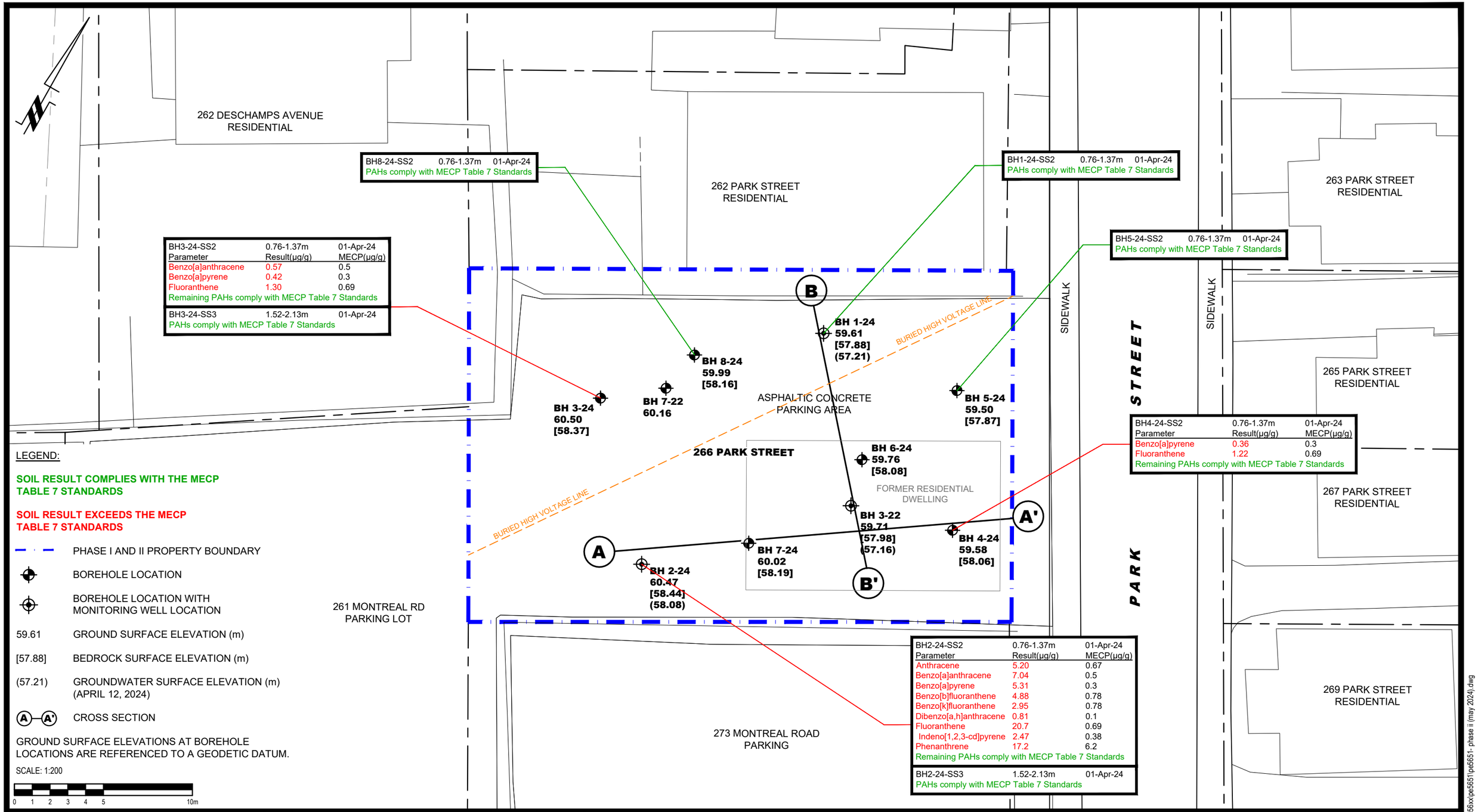

LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS THE MECP TABLE 7 STANDARDS

- PHASE I AND II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE LOCATION WITH MONITORING WELL LOCATION
- 59.61 GROUND SURFACE ELEVATION (m)
- [57.88] BEDROCK SURFACE ELEVATION (m)
- (57.21) GROUNDWATER SURFACE ELEVATION (m) (APRIL 12, 2024)
- A—A' CROSS SECTION

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:200

0 1 2 3 4 5 10m

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CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title: **ANALYTICAL TESTING PLAN - SOIL (PAHs)**

Scale: 1:200	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-6
Approved by: MSD	Revision No.:

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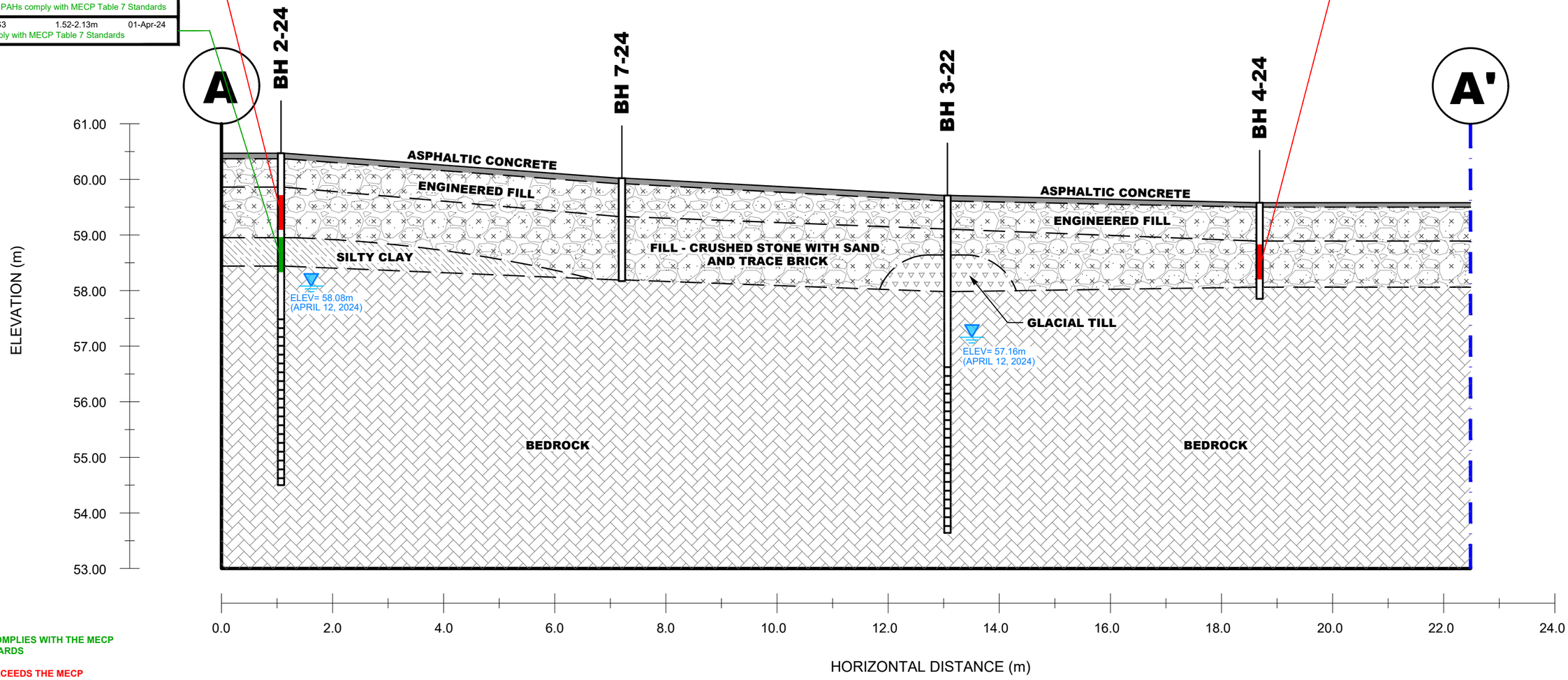
BH2-24-SS2	0.76-1.37m	01-Apr-24
Parameter	Result(µg/g)	MECP(µg/g)
Anthracene	5.20	0.67
Benzo[a]anthracene	7.04	0.5
Benzo[a]pyrene	5.31	0.3
Benzo[b]fluoranthene	4.88	0.78
Benzo[k]fluoranthene	2.95	0.78
Dibenzo[a,h]anthracene	0.81	0.1
Fluoranthene	20.7	0.69
Indeno[1,2,3-cd]pyrene	2.47	0.38
Phenanthrene	17.2	6.2
Remaining PAHs comply with MECP Table 7 Standards		

BH2-24-SS3	1.52-2.13m	01-Apr-24
PAHs comply with MECP Table 7 Standards		

BH4-24-SS2	0.76-1.37m	01-Apr-24
Parameter	Result(µg/g)	MECP(µg/g)
Benzo[a]pyrene	0.36	0.3
Fluoranthene	1.22	0.69
Remaining PAHs comply with MECP Table 7 Standards		



LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

PATERSON GROUP
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NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title: CROSS SECTION A-A' - SOIL (PAHs)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-6A
Approved by: MSD	Revision No.:

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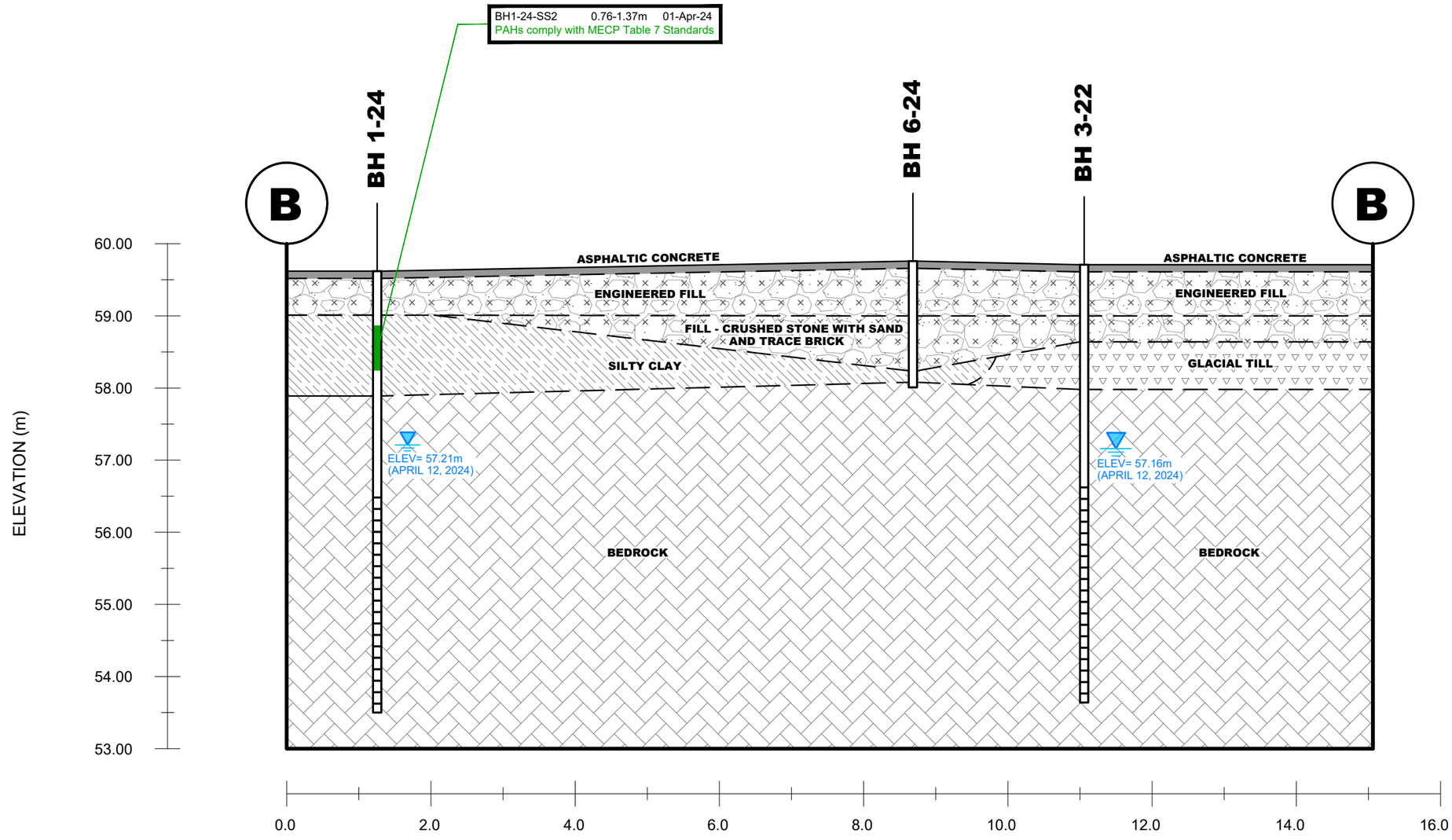

LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET

OTTAWA, ONTARIO

Title: CROSS SECTION B-B' - SOIL (PAHs)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-6B
Approved by: MSD	Revision No.:

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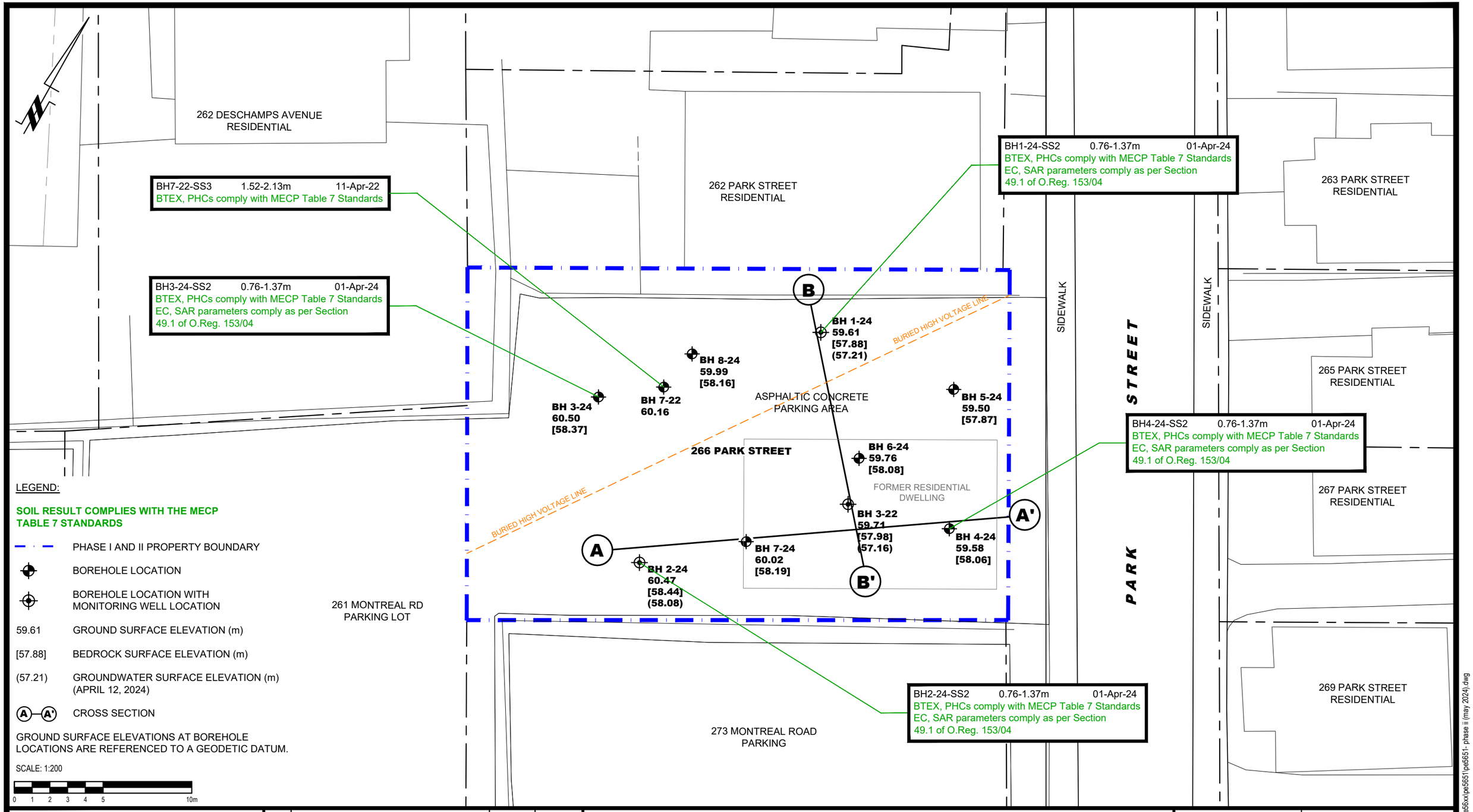

LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

- PHASE I AND II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE LOCATION WITH MONITORING WELL LOCATION
- 59.61 GROUND SURFACE ELEVATION (m)
- [57.88] BEDROCK SURFACE ELEVATION (m)
- (57.21) GROUNDWATER SURFACE ELEVATION (m) (APRIL 12, 2024)
- A—A' CROSS SECTION

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:200

0 1 2 3 4 5 10m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: **ANALYTICAL TESTING PLAN - SOIL (BTEX, PHCs, EC, SAR)**

Scale: 1:200	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-7
Approved by: MSD	Revision No.:

11x17

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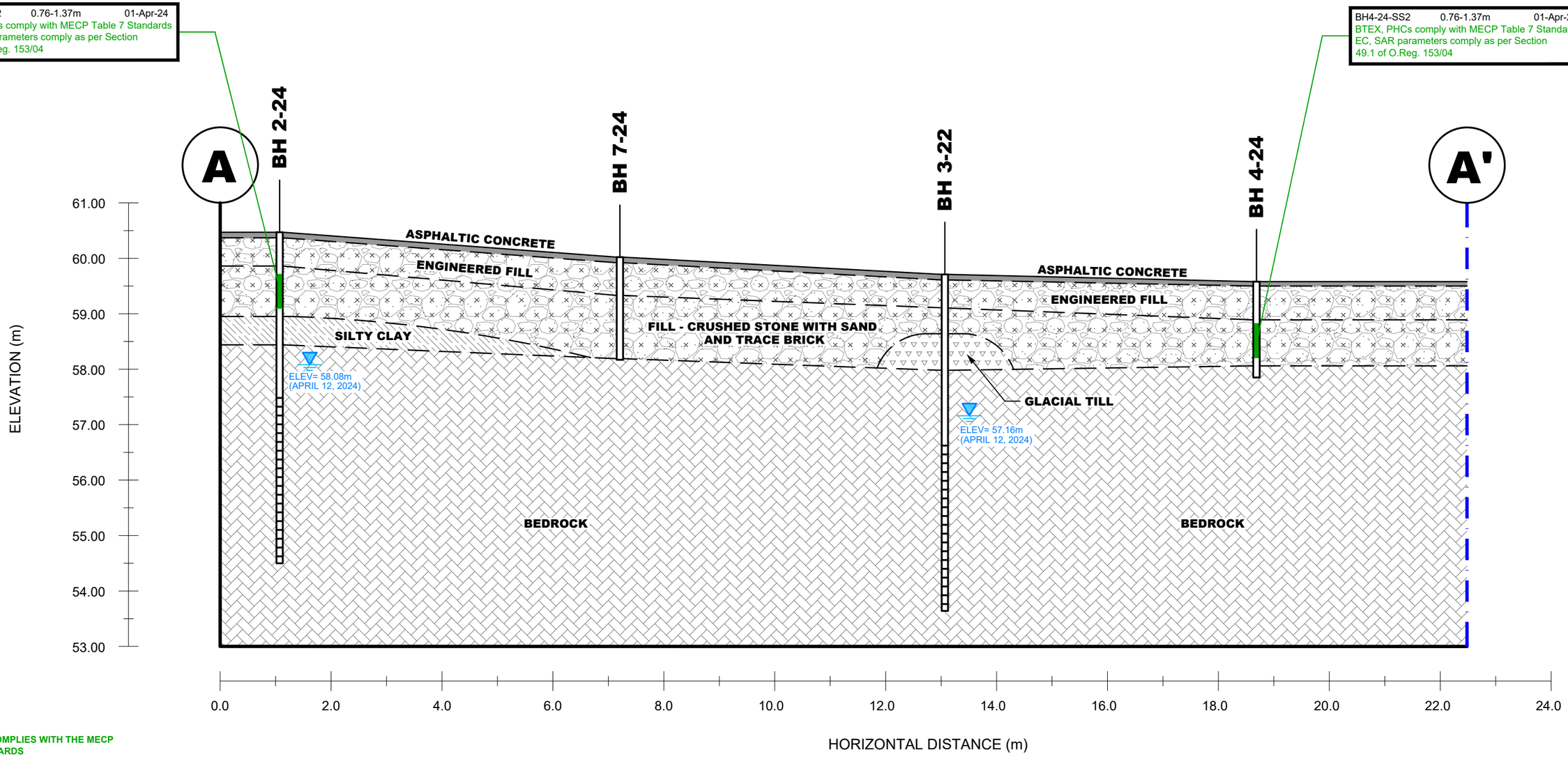
BH2-24-SS2 0.76-1.37m 01-Apr-24
BTEX, PHCs comply with MECP Table 7 Standards
EC, SAR parameters comply as per Section
49.1 of O.Reg. 153/04

BH4-24-SS2 0.76-1.37m 01-Apr-24
BTEX, PHCs comply with MECP Table 7 Standards
EC, SAR parameters comply as per Section
49.1 of O.Reg. 153/04



LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: CROSS SECTION A-A' - SOIL (BTEX, PHCs, EC, SAR)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-7A
Approved by: MSD	Revision No.:

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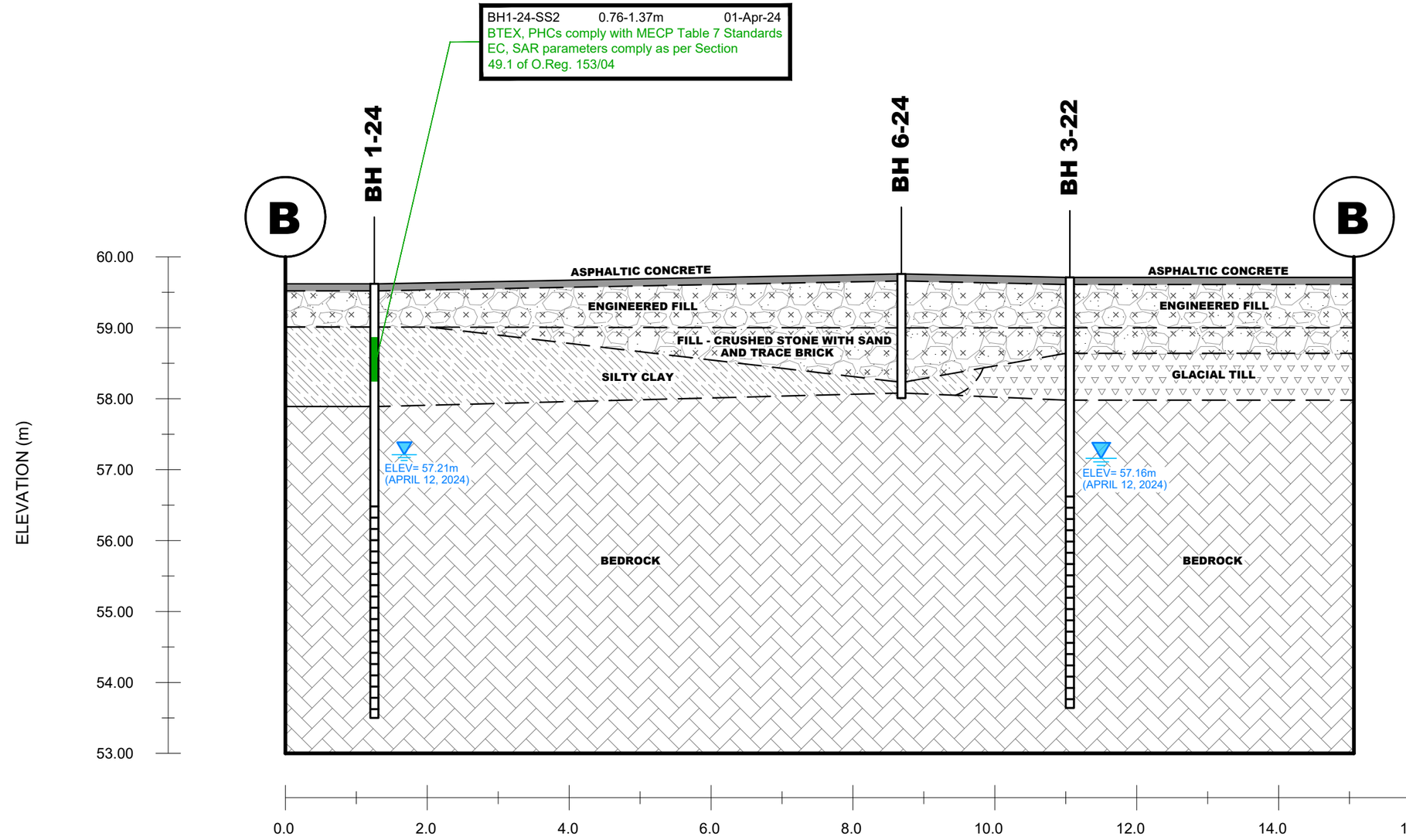
BH1-24-SS2 0.76-1.37m 01-Apr-24
BTEX, PHCs comply with MECP Table 7 Standards
EC, SAR parameters comply as per Section 49.1 of O.Reg. 153/04



LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: CROSS SECTION B-B' - SOIL (BTEX, PHCs, EC, SAR)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-7B
Approved by: MSD	Revision No.:

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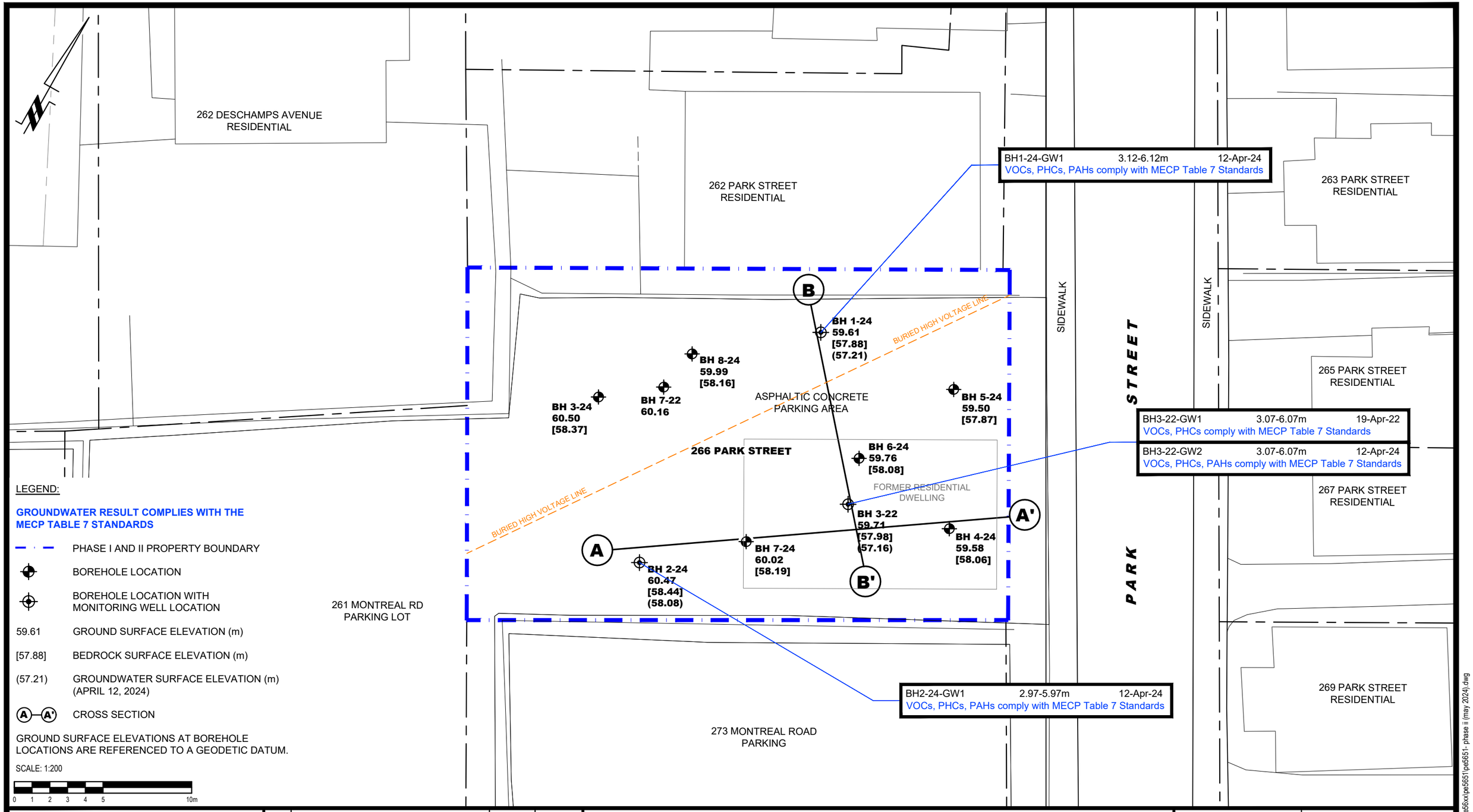

LEGEND:

GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

- PHASE I AND II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE LOCATION WITH MONITORING WELL LOCATION
- 59.61 GROUND SURFACE ELEVATION (m)
- [57.88] BEDROCK SURFACE ELEVATION (m)
- (57.21) GROUNDWATER SURFACE ELEVATION (m) (APRIL 12, 2024)
- A—A' CROSS SECTION

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:200

0 1 2 3 4 5 10m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: ANALYTICAL TESTING PLAN - GROUNDWATER (VOCs, PHCs, PAHs)

Scale: 1:200	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-8
Approved by: MSD	Revision No.:

11x17

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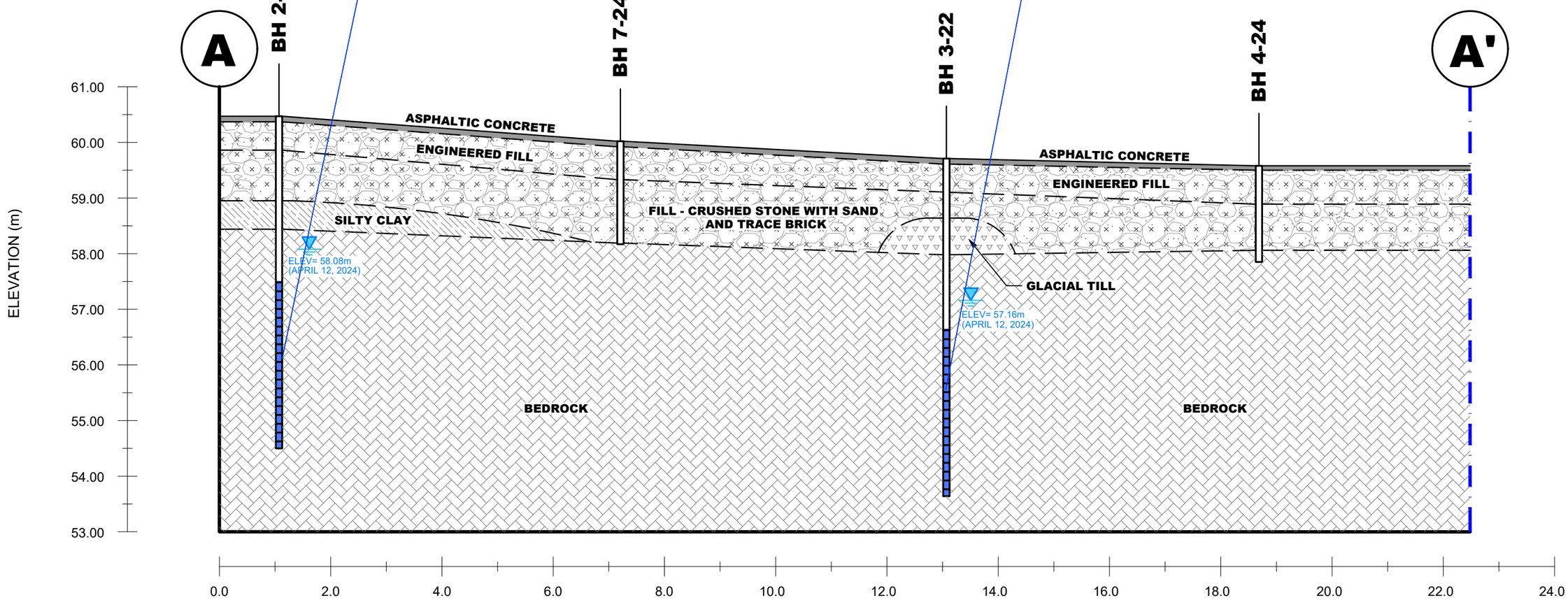
BH2-24-GW1 2.97-5.97m 12-Apr-24
VOCs, PHCs, PAHs comply with MECP Table 7 Standards

BH3-22-GW1 3.07-6.07m 19-Apr-22
VOCs, PHCs comply with MECP Table 7 Standards

BH3-22-GW2 3.07-6.07m 12-Apr-24
VOCs, PHCs, PAHs comply with MECP Table 7 Standards



LEGEND:

GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: CROSS SECTION A-A' - GROUNDWATER (VOCs, PHCs, PAHs)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-8A
Approved by: MSD	Revision No.:

11x17

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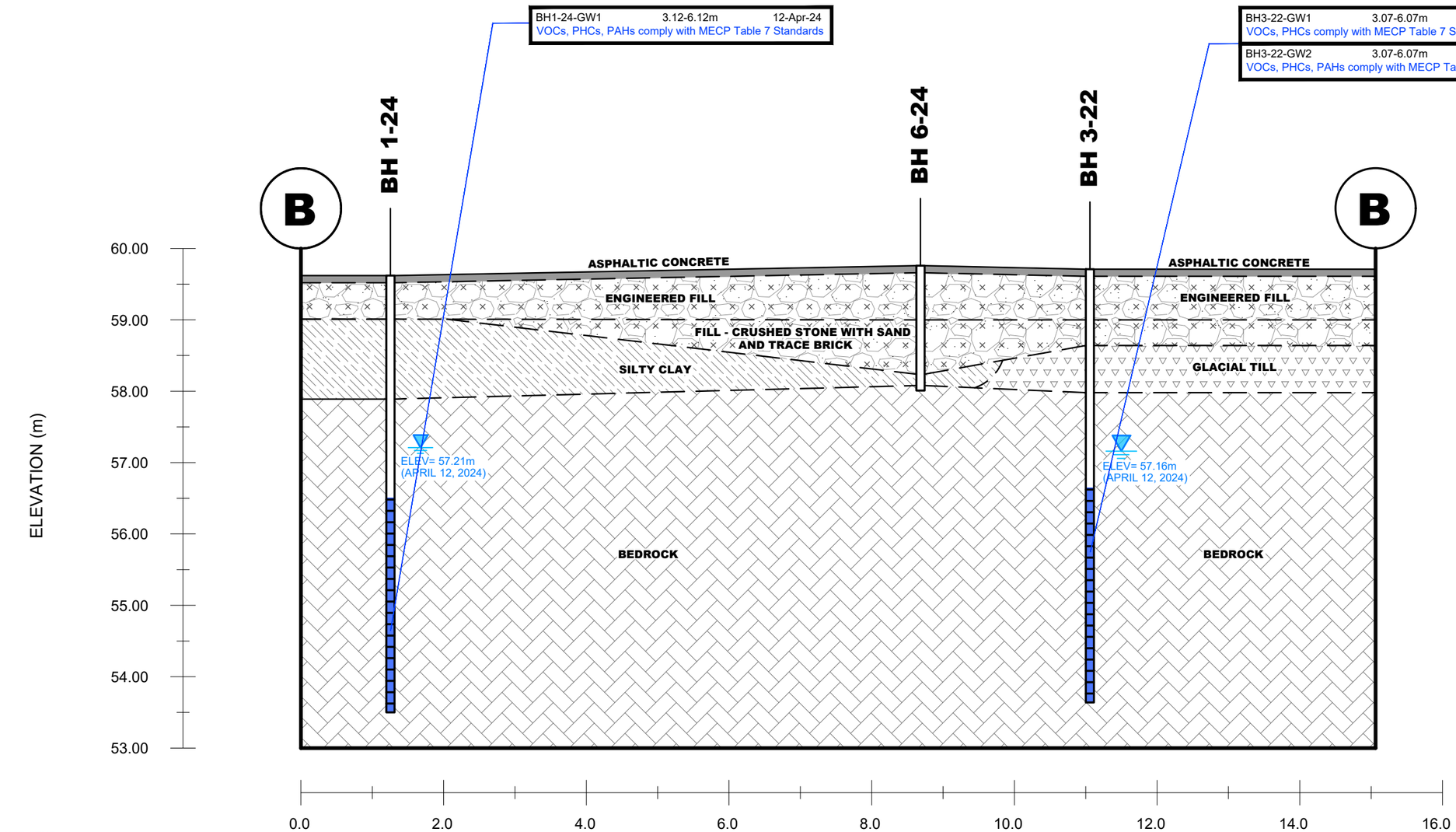

LEGEND:

GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 7 STANDARDS

PHASE I AND II PROPERTY BOUNDARY

PATERSON GROUP
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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CONCORDE PROPERTIES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
266 PARK STREET
OTTAWA, ONTARIO

Title: CROSS SECTION B-B' - GROUNDWATER (VOCs, PHCs, PAHs)

Scale: AS SHOWN	Date: 05/2024
Drawn by: YA	Report No.: PE5651-3
Checked by: NS	Dwg. No.: PE5651-8B
Approved by: MSD	Revision No.:

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11x17

APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

PATERSON GROUP

Sampling & Analysis Plan

266 Park Street

Ottawa, Ontario

Prepared for Concorde Properties

Report: PE5651-SAP
March 15, 2024

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1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Concorde Properties, to conduct a Phase II – Environmental Site Assessment (Phase II ESA) for 266 Park Street, Ottawa, Ontario.

Based on the findings of the Phase I ESA, the following subsurface investigation program was developed.

Borehole	Location	Rationale	Proposed Depth & Rationale
BH1-24	Northern portion of Phase I Property	To assess for potential impacts resulting from the presence of fill material of unknown quality, the use of road salt for de-icing purposes, a former off-site dry cleaners, and for excess soil qualification purposes.	5-7 m; to intercept the groundwater table for the purpose of installing a monitoring well.
BH2-24	South-Central portion of Phase I Property		
BH3-24	Western portion of Phase I Property	To assess for potential impacts resulting from the presence of fill material of unknown quality, the use of road salt for de-icing purposes, and for excess soil qualification purposes.	1-2 m; to practical refusal on inferred bedrock.
BH4-24	Southeastern portion of Phase I Property		
BH5-24	Eastern portion of Phase I Property		
BH6-24	East-Central portion of Phase I Property		
BH7-24	South-Central portion of Phase I Property		
BH8-24	North-Central Portion of Phase I Property		

Borehole locations are shown on Drawing PE5651-4 – Test Hole Location Plan, appended to the main report.

At each borehole, split-spoon samples of the overburden soils will be obtained at 0.76 m (2'6") intervals. All soil samples will be retained, and samples will be selected for submission following a preliminary screening analysis.

Following the borehole drilling, groundwater monitoring wells will be installed in all three boreholes to allow for the collection of groundwater samples.

2.0 ANALYTICAL TESTING PROGRAM

The analytical testing program for soil at the Phase I Property is based on the following general considerations:

- ❒ At least one sample from each borehole should be submitted, in order to delineate the horizontal extent of contamination across the site.
- ❒ At least one sample from each stratigraphic unit should be submitted, in order to delineate the vertical extent of contamination at the site.
- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MECP site condition standards.
- ❒ In boreholes with evidence of contamination as described above, a sample should be submitted from the stratigraphic unit below the 'worst-case' sample to determine whether the contaminant(s) have migrated downward.
- ❒ Parameters analyzed should be consistent with the Contaminants of Potential Concern identified in the Phase I ESA.

The analytical testing program for soil at the Phase I Property is based on the following general considerations:

- ❒ Groundwater monitoring wells should be installed in all boreholes with visual or olfactory evidence of soil contamination, in stratigraphic units where soil contamination was encountered, where those stratigraphic units are at or below the water table (i.e. a water sample can be obtained).
- ❒ Groundwater monitoring well screens should straddle the water table at sites where the contaminants of concern are suspected to be LNAPLs.
- ❒ At least one groundwater monitoring well should be installed in a stratigraphic unit below the suspected contamination, where said stratigraphic unit is water-bearing.
- ❒ Parameters analyzed should be consistent with the Contaminants of Concern identified in the Phase I ESA and with the contaminants identified in the soil samples.

3.0 STANDARD OPERATING PROCEDURES

3.1 Environmental Drilling Procedure

Purpose

The purpose of environmental boreholes is to identify and/or delineate contamination within the soil and/or to install groundwater monitoring wells in order to identify contamination within the groundwater.

Equipment

The following is a list of equipment that is in addition to regular drilling equipment stated in the geotechnical drilling SOP:

- ❒ Glass soil sample jars
- ❒ two buckets
- ❒ cleaning brush (toilet brush works well)
- ❒ dish detergent
- ❒ methyl hydrate
- ❒ water (if not available on site - water jugs available in trailer)
- ❒ latex or nitrile gloves (depending on suspected contaminant)
- ❒ RKI Eagle organic vapour meter or MiniRae photoionization detector (depending on contamination suspected)

Determining Borehole Locations

If conditions on site are not as suspected, and planned borehole locations cannot be drilled, **call the office to discuss**. Alternative borehole locations will be determined in conversation with the field technician and supervising engineer.

After drilling is completed a plan with the borehole locations must be provided. Distances and orientations of boreholes with respect to site features (buildings, roadways, etc.) must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Ground surface elevations at each borehole should be surveyed relative to a geodetic benchmark, if one is available, or a temporary site benchmark which can be tied in at a later date if necessary.

Drilling Procedure

The actual drilling procedure for environmental boreholes is the same as geotechnical boreholes (see SOP for drilling and sampling) with a few exceptions as follows:

- ❒ Continuous split spoon samples (every 0.6 m or 2') or semi-continuous (every 0.76 m or 2'6") are required.
- ❒ Make sure samples are well sealed in plastic bags with no holes prior to screening and are kept cool but unfrozen.
- ❒ If sampling for VOCs, BTEX, or PHCs F_1, a soil core from each soil sample, which may be analyzed, must be taken and placed in the laboratory-provided methanol vial.
- ❒ Note all and any odours or discolouration of samples.
- ❒ Split spoon samplers must be washed between samples.
- ❒ If obvious contamination is encountered, continue sampling until vertical extent of contamination is delineated.
- ❒ As a general rule, environmental boreholes should be deep enough to intercept the groundwater table (unless this is impossible/impractical - call project manager to discuss).
- ❒ If at all possible, soil samples should be submitted to a preliminary screening procedure on site, either using a RKI Eagle, PID, etc. depending on type of suspected contamination.

Spoon Washing Procedure

All sampling equipment (spilt spoons, etc.) must be washed between samples in order to prevent cross contamination of soil samples.

- ❒ Obtain two buckets of water (preferably hot if available)
- ❒ Add a small amount of dish soap to one bucket
- ❒ Scrub spoons with brush in soapy water, inside and out, including tip
- ❒ Rinse in clean water
- ❒ Apply a small amount of methyl hydrate to the inside of the spoon. (A spray bottle or water bottle with a small hole in the cap works well)
- ❒ Allow to dry (takes seconds)
- ❒ Rinse with distilled water, a spray bottle works well.

The methyl hydrate eliminates any soap residue that may be on the spoon and is especially important when dealing with suspected VOCs.

Screening Procedure

The RKI Eagle is used to screen most soil samples, particularly where petroleum hydrocarbon contamination is suspected. The MiniRae is used when VOCs are suspected, however it also can be useful for detecting petroleum. These tools are for screening purposes only and cannot be used in place of laboratory testing. Vapour results obtained from the RKI Eagle and the PID are relative and must be interpreted.

Screening equipment should be calibrated on an approximately monthly basis, more frequently if heavily used.

- ❒ Samples should be brought to room temperature; this is specifically important in colder weather. Soil must not be frozen.
- ❒ Turn instrument on and allow to come to zero - calibrate if necessary
- ❒ If using RKI Eagle, ensure instrument is in methane elimination mode unless otherwise directed.
- ❒ Ensure measurement units are ppm (parts per million) initially. RKI Eagle will automatically switch to %LEL (lower explosive limit) if higher concentrations are encountered.
- ❒ Break up large lumps of soil in the sample bag, taking care not to puncture bag.
- ❒ Insert probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in bag while observing instrument readings.
- ❒ Record the highest value obtained in the first 15 to 25 seconds
- ❒ Make sure to indicate scale (ppm or LEL); also note which instrument was used (RKI Eagle 1 or 2, or MiniRae).
- ❒ Jar samples and refrigerate as per Sampling and Analysis Plan.

3.2 Monitoring Well Installation Procedure

Equipment

- ❒ 5' x 2" threaded sections of Schedule 40 PVC slotted well screen (5' x 1 ¼" if installing in cored hole in bedrock)
- ❒ 5' x 2" threaded sections of Schedule 40 PVC riser pipe (5' x 1 ¼" if installing in cored hole in bedrock)
- ❒ Threaded end-cap
- ❒ Slip-cap or J-plug
- ❒ Asphalt cold patch or concrete
- ❒ Silica Sand
- ❒ Bentonite chips (Holeplug)
- ❒ Steel flushmount casing

Procedure

- ❒ Drill borehole to required depth, using drilling and sampling procedures described above.
- ❒ If borehole is deeper than required monitoring well, backfill with bentonite chips to required depth. This should only be done on wells where contamination is not suspected, in order to prevent downward migration of contamination.
- ❒ Only one monitoring well should be installed per borehole.
- ❒ Monitoring wells should not be screened across more than one stratigraphic unit to prevent potential migration of contaminants between units.
- ❒ Where LNAPLs are the suspected contaminants of concern, monitoring wells should be screened straddling the water table in order to capture any free product floating on top of the water table.
- ❒ Thread the end cap onto a section of screen. Thread second section of screen if required. Thread risers onto screen. Lower into borehole to required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials entering well.
- ❒ As drillers remove augers, backfill borehole annulus with silica sand until the level of sand is approximately 0.3 m above the top of the screen.
- ❒ Backfill with holeplug until at least 0.3 m of holeplug is present above the top of the silica sand.
- ❒ Backfill remainder of borehole with holeplug or with auger cuttings (if contamination is not suspected).
- ❒ Install flushmount casing. Seal space between flushmount and borehole annulus with concrete, cold patch, or holeplug to match surrounding ground surface.

3.3 Monitoring Well Sampling Procedure

Equipment

- ❒ Water level metre or interface probe on hydrocarbon/LNAPL sites
- ❒ Spray bottles containing water and methanol to clean water level tape or interface probe
- ❒ Peristaltic pump
- ❒ Polyethylene tubing for peristaltic pump
- ❒ Flexible tubing for peristaltic pump
- ❒ Latex or nitrile gloves (depending on suspected contaminant)
- ❒ Allen keys and/or 9/16" socket wrench to remove well caps
- ❒ Graduated bucket with volume measurements
- ❒ pH/Temperature/Conductivity combo pen
- ❒ Laboratory-supplied sample bottles

Sampling Procedure

- ❒ Locate well and use socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to existing ground surface, using water level meter or interface probe. If using interface probe on suspected NAPL site, measure the thickness of free product.
- ❒ Measure total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate volume of standing water within well and record.
- ❒ Insert polyethylene tubing into well and attach to peristaltic pump. Turn on peristaltic pump and purge into graduated bucket. Purge at least three well volumes of water from the well. Measure and record field chemistry. Continue to purge, measuring field chemistry after every well volume purged, until appearance or field chemistry stabilizes.
- ❒ Note appearance of purge water, including colour, opacity (clear, cloudy, silty), sheen, presence of LNAPL, and odour. Note any other unusual features (particulate matter, effervescence (bubbling) of dissolved gas, etc.).
- ❒ Fill required sample bottles. If sampling for metals, attach 75-micron filter to discharge tube and filter metals sample. If sampling for VOCs, use low flow rate to ensure continuous stream of non-turbulent flow into sample bottles. Ensure no headspace is present in VOC vials.
- ❒ Replace well cap and flushmount casing cap.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The QA/QC program for this Phase II ESA is as follows:

- ❒ All non-dedicated sampling equipment (split spoons) will be decontaminated according to the SOPs listed above.
- ❒ All groundwater sampling equipment is dedicated (polyethylene and flexible peristaltic tubing is replaced for each well).
- ❒ Where groundwater samples are to be analyzed for VOCs, one laboratory-provided trip blank will be submitted for analysis with every laboratory submission.
- ❒ Approximately one (1) field duplicate will be submitted for every ten (10) samples submitted for laboratory analysis. A minimum of one (1) field duplicate per project will be submitted. Field duplicates will be submitted for soil and groundwater samples
- ❒ Where combo pens are used to measure field chemistry, they will be calibrated on an approximately monthly basis, according to frequency of use.

5.0 DATA QUALITY OBJECTIVES

The purpose of setting data quality objectives (DQOs) is to ensure that the level of uncertainty in data collected during the Phase II ESA is low enough that decision-making is not affected, and that the overall objectives of the investigation are met.

The quality of data is assessed by comparing field duplicates with original samples. If the relative percent difference (RPD) between the duplicate and the sample is within 20%, the data are considered to be of sufficient quality so as not to affect decision-making. The RPD is calculated as follows:

$$RPD = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100\%$$

Where x_1 is the concentration of a given parameter in an original sample and x_2 is the concentration of that same parameter in the field duplicate sample.

For the purpose of calculating the RPD, it is desirable to select field duplicates from samples for which parameters are present in concentrations above laboratory detection limits, i.e. samples which are expected to be contaminated. If parameters are below laboratory detection limits for selected samples or duplicates, the RPD may be calculated using a concentration equal to one half the laboratory detection limit.

It is also important to consider data quality in the overall context of the project. For example, if the DQOs are not met for a given sample, yet the concentrations of contaminants in both the sample and the duplicate exceed the MOE site remediation standards by a large margin, the decision-making usefulness of the sample may not be considered to be impaired. The proximity of other samples which meet the DQOs must also be considered in developing the Phase II Conceptual Site Model; often there are enough data available to produce a reliable Phase II Conceptual Site Model even if DQOs are not met for certain individual samples.

These considerations are discussed in the body of the report.

6.0 PHYSICAL IMPEDIMENTS

Physical impediments to the Sampling and Analysis plan may include:

- ❒ The location of underground utilities
- ❒ Poor recovery of split-spoon soil samples
- ❒ Insufficient groundwater volume for groundwater samples
- ❒ Breakage of sampling containers following sampling or while in transit to the laboratory
- ❒ Elevated detection limits due to matrix interference (generally related to soil colour or presence of organic material)
- ❒ Elevated detection limits due to high concentrations of certain parameters, necessitating dilution of samples in laboratory
- ❒ Drill rig breakdowns
- ❒ Winter conditions
- ❒ Other site-specific impediments

Site-specific impediments to the Sampling and Analysis plan are discussed in the body of the Phase II ESA report.

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
259-261 Montreal Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 59.71
DATUM: Geodetic
REMARKS:
BORINGS BY: CME-55 Low Clearance Drill **DATE:** April 12, 2022

FILE NO. PE5651
HOLE NO. BH 3-22

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.71
ASPHALTIC CONCRETE 0.05		AU	1				
FILL: Dark brown to brown silty sand with gravel and crushed stone, trace brick and wood							
1.07		SS	2	71	26	1	58.71
GLACIAL TILL: Dense, brown silty clay wtih sand, gravel, cobbles and boulders		SS	3	60	50+		
1.73						2	57.71
		RC	1	91	29		
						3	56.71
BEDROCK: Poor to very poor quality, black shale		RC	2	92	41	4	55.71
						5	54.71
		RC	3	100	20		
6.07						6	53.71
End of Borehole							
(GWL @ 2.55m - April 12, 2024)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ Lower Explosive Limit %
20 40 60 80

MONITORING WELL CONSTRUCTION

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
259-261 Montreal Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5651

REMARKS

HOLE NO. BH 7-22

BORINGS BY CME-55 Low Clearance Drill **DATE** 2022 April 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Asphalt 0.05						0	60.16
FILL: Compact brown silty sand with gravel and crushed stone 0.36		AU	1				
GLACIAL TILL: Compact brown silty sand with gravel, crushed stone, trace clay, cobbles and boulders 0.91		SS	2	88	28	1	59.16
GLACIAL TILL: Dense brown silty clay with sand, gravel, sand, trace cobbles and boulders		SS	3	62	50		
2.06						2	58.16
End of Borehole							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370460.202 **NORTHING:** 5033369.607 **ELEVATION:** 59.61
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 1-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.61
ASPHALTIC CONCRETE 0.10							
FILL: Brown silty sand with gravel and crushed stone 0.61		AU	1				
Firm to stiff, brown **SILTY CLAY** with sand, trace gravel		SS	2	58	7	1	58.61
1.73		SS	3	91	+50		
BEDROCK: Very poor to poor quality, shale bedrock		SS	4	80	+50	2	57.61
						3	56.61
		RC	1	100	0	4	55.61
						5	54.61
		RC	2	92	31		
6.12						6	53.61
End of Borehole							
(GWL @ 2.40m - April 12, 2024)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

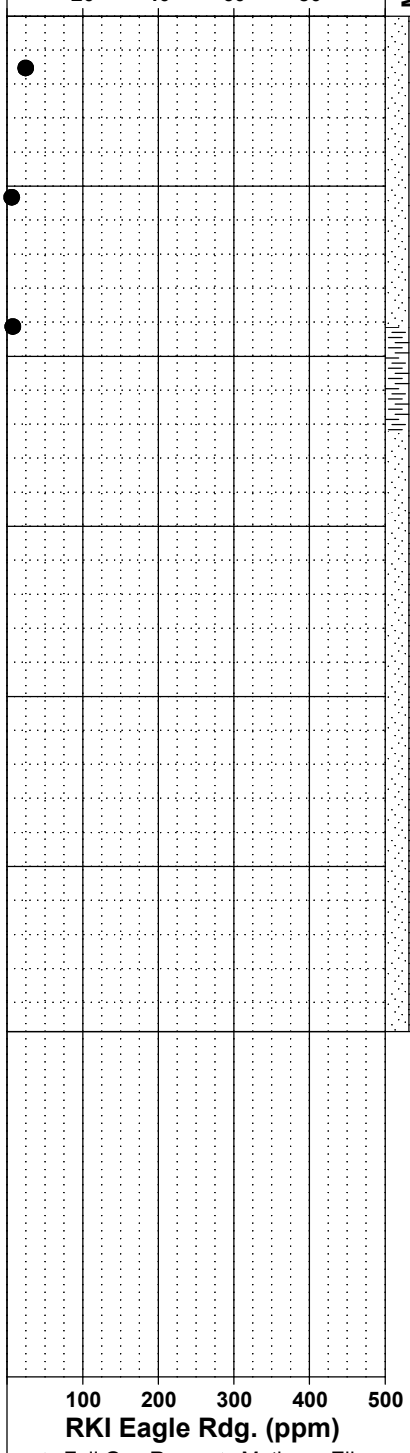
Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370457.627 **NORTHING:** 5033353.284 **ELEVATION:** 60.47
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	60.47
ASPHALTIC CONCRETE 0.08							
FILL: Brown silty sand with gravel and crushed stone		AU	1				
0.61							
FILL: Brown silty clay with sand, trace gravel and brick		SS	2	58	10	1	59.47
1.52							
Stiff, brown **SILTY CLAY** with sand and gravel		SS	3	83	10	2	58.47
2.03							
BEDROCK: Very poor quality, shale bedrock		SS	4	0	+50		
						3	57.47
		RC	1	100	0		
						4	56.47
						5	55.47
		RC	2	92	15		
5.97							
End of Borehole							
(GWL @ 2.39m - April 12, 2024)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ **Lower Explosive Limit %**



MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370451.045 **NORTHING:** 5033360.299 **ELEVATION:** 60.50
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	60.50
ASPHALTIC CONCRETE 0.03							
FILL: Brown silty sand with gravel and crushed stone		AU	1				
0.69							
FILL: Brown silty clay with sand, trace gravel 1.07		SS	2	42	24	1	59.50
Very stiff, brown **SILTY CLAY** with sand, trace gravel		SS	3	58	16		
2.13						2	58.50
BEDROCK: Very poor quality, shale bedrock 2.41		SS	4	80	+50		
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370471.938 **NORTHING:** 5033363.494 **ELEVATION:** 59.58
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 4-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.58
ASPHALTIC CONCRETE 0.03							
FILL: Brown silty sand with gravel and crushed stone		AU	1				
0.69							
FILL: Brown silty sand with clay, brick and gravel		SS	2	25	10	1	58.58
1.52							
BEDROCK: Very poor quality, shale bedrock 1.73		SS	3	50	+50		
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ Lower Explosive Limit %

20 40 60 80

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370468.313 **NORTHING:** 5033370.466 **ELEVATION:** 59.50
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.50
ASPHALTIC CONCRETE 0.05							
FILL: Brown silty sand with gravel and crushed stone 0.61		AU	1				
Stiff, brown **SILTY CLAY** with sand, trace gravel		SS	2	50	14	1	58.50
1.63		SS	3		+50		
BEDROCK: Very poor quality, shale bedrock 1.80							
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ Lower Explosive Limit %

20 40 60 80

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370465.556 **NORTHING:** 5033364.466 **ELEVATION:** 59.76
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 6-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	MONITORING WELL CONSTRUCTION
GROUND SURFACE									
ASPHALTIC CONCRETE 0.05									
FILL: Brown silty sand, trace gravel and brick		AU	1			0	59.76		
0.76									
FILL: Brown silty clay with sand, gravel and brick		SS	2	50	7	1	58.76		
1.52									
Stiff, brown **SILTY CLAY** with sand and gravel 1.68		SS	3	44	+50				
1.75									
BEDROCK: Very poor quality, shale bedrock									
End of Borehole									

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

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

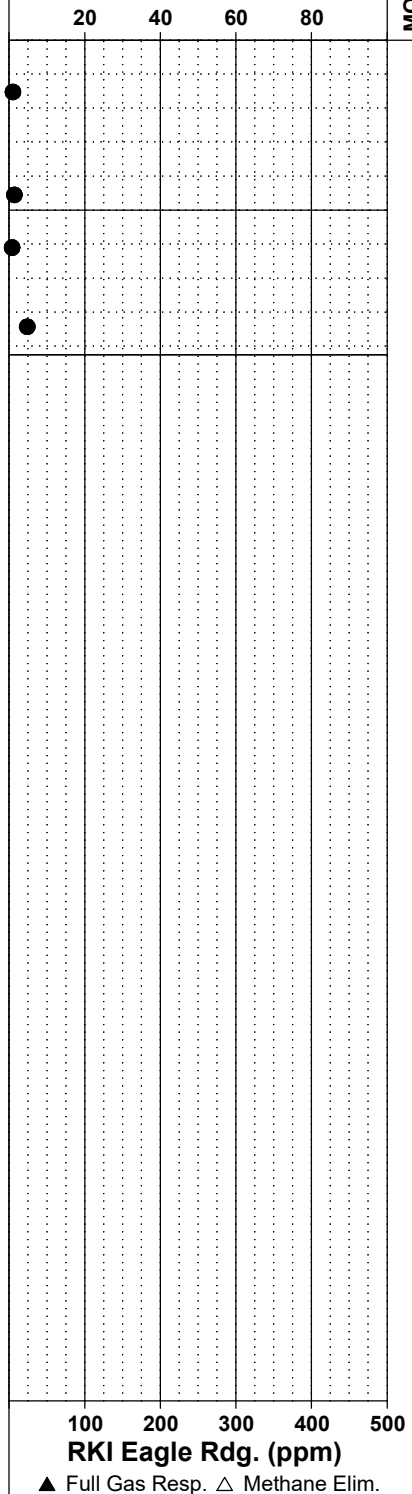
Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370462.3 **NORTHING:** 5033357.257 **ELEVATION:** 60.02
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 7-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	60.02
ASPHALTIC CONCRETE 0.05							
FILL: Brown silty sand, trace gravel and brick 0.69		AU	1				
FILL: Brown silty clay with sand and crushed stone		SS	2	67	18	1	59.02
- shale fragments and trace gravel by 1.5m depth 1.83		SS	3	77	+50		
BEDROCK: Very poor quality, shale bedrock 1.85							
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ **Lower Explosive Limit %**



▲ Full Gas Resp. △ Methane Elim.

MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Phase II ESA
266 Park Street
Ottawa, Ontario

EASTING: 370454.464 **NORTHING:** 5033365 **ELEVATION:** 59.99
DATUM: Geodetic
REMARKS:
BORINGS BY: Truck-mounted auger **DATE:** April 1, 2024

FILE NO. PE5651
HOLE NO. BH 8-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	59.99
ASPHALTIC CONCRETE 0.03							
FILL: Brown silty sand with gravel and crushed stone 0.69		AU	1				
FILL: Brown silty clay with sand, trace gravel and crushed stone 1.37		SS	2	67	7	1	58.99
Very stiff, brown **SILTY CLAY** with sand, trace gravel 1.83		SS	3	80	+50		
BEDROCK: Very poor quality, shale bedrock 1.91							
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)
○ Lower Explosive Limit %
20 40 60 80
100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

MONITORING WELL CONSTRUCTION

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the relative strength of cohesionless soils is the compactness condition, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

Compactness Condition	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity, S_t, is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NQ or larger size core. However, it can be used on smaller core sizes, such as BQ, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

RQD %	**ROCK QUALITY**
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

WC%	-	Natural water content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic Limit, % (water content above which soil behaves plastically)
PI	-	Plasticity Index, % (difference between LL and PL)
Dxx	-	Grain size at which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2 / (D10 \times D60)$
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay (more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

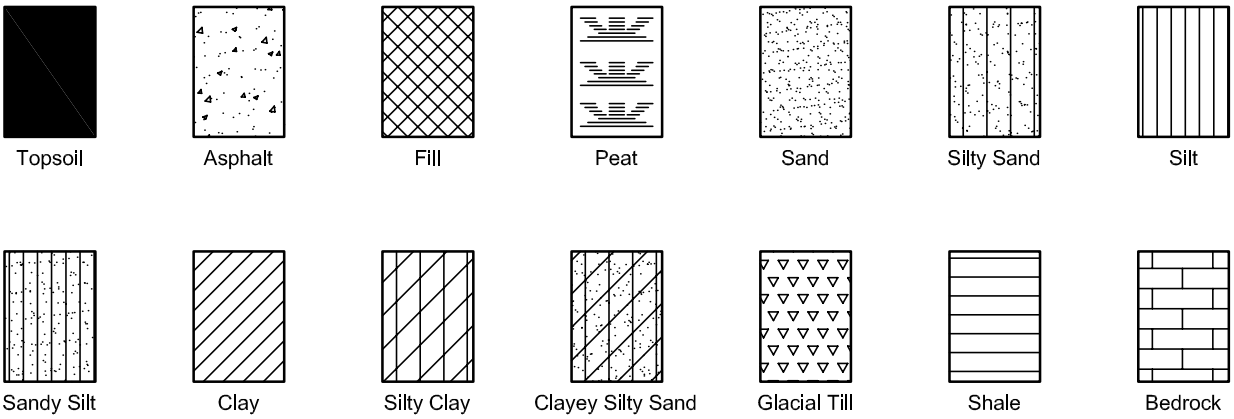
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

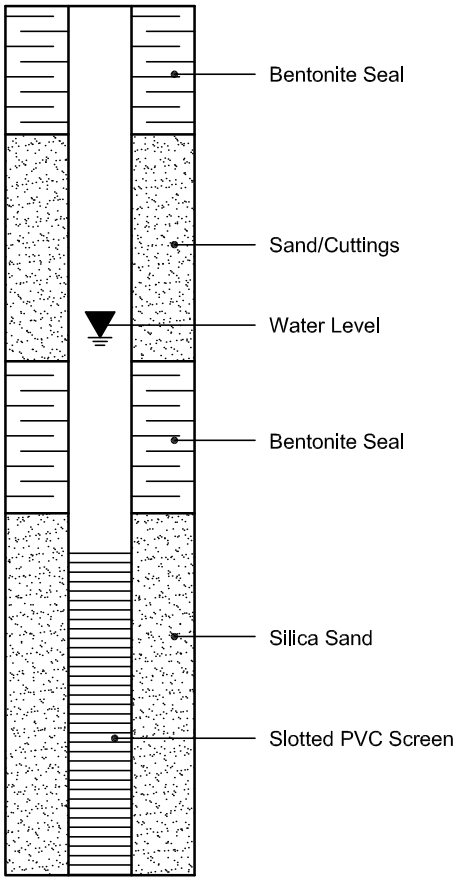
SYMBOLS AND TERMS (continued)

STRATA PLOT

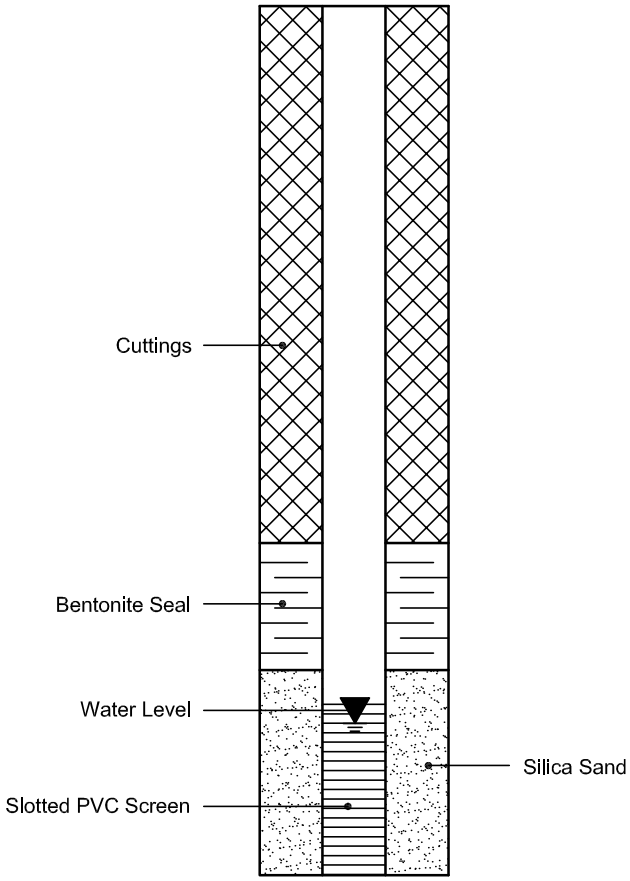


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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Certificate of Analysis

Paterson Group Consulting Engineers (Ottawa)
9 Auriga Drive
Ottawa, ON K2E 7T9
Attn: Nick Sullivan

Client PO: 59923
Project: PE5651
Custody:

Report Date: 16-Apr-2024
Order Date: 3-Apr-2024

Revised Report

Order #: 2414243

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2414243-01	BH1-24-SS2
2414243-03	BH2-24-SS2
2414243-04	BH2-24-SS3
2414243-05	BH3-24-SS2
2414243-06	BH3-24-SS3
2414243-07	BH4-24-SS2
2414243-08	BH5-24-SS2
2414243-11	BH8-24-SS2
2414243-12	DUP1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	5-Apr-24	5-Apr-24
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	8-Apr-24	9-Apr-24
Conductivity	MOE E3138 - probe @25 °C, water ext	5-Apr-24	5-Apr-24
Mercury by CVAA	EPA 7471B - CVAA, digestion	5-Apr-24	5-Apr-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	5-Apr-24	5-Apr-24
PHC F1	CWS Tier 1 - P&T GC-FID	5-Apr-24	5-Apr-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	5-Apr-24	6-Apr-24
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	5-Apr-24	5-Apr-24
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	4-Apr-24	6-Apr-24
SAR	Calculated	5-Apr-24	8-Apr-24
Solids, %	CWS Tier 1 - Gravimetric	4-Apr-24	5-Apr-24

Certificate of Analysis

Report Date: 16-Apr-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 3-Apr-2024

Client PO: **59923**

Project Description: PE5651

	Client ID:	BH1-24-SS2	BH2-24-SS2	BH2-24-SS3	BH3-24-SS2	-	-
	Sample Date:	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00		
	Sample ID:	2414243-01	2414243-03	2414243-04	2414243-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	83.1	82.6	84.6	87.0	-	-
General Inorganics							
SAR	0.01 N/A	11.1	7.70	-	7.14	-	-
Conductivity	5 uS/cm	1940	6060	-	5440	-	-
pH	0.05 pH Units	7.51	-	-	-	-	-
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Arsenic	1.0 ug/g	6.9	12.5	6.4	8.0	-	-
Barium	1.0 ug/g	111	216	80.6	174	-	-
Beryllium	0.5 ug/g	1.2	1.0	0.8	0.7	-	-
Boron	5.0 ug/g	15.1	10.9	9.8	9.7	-	-
Cadmium	0.5 ug/g	<0.5	0.7	<0.5	0.5	-	-
Chromium (VI)	0.2 ug/g	1.5	<0.2	0.7	<0.2	-	-
Chromium	5.0 ug/g	33.6	29.2	28.4	22.1	-	-
Cobalt	1.0 ug/g	15.2	14.4	14.0	9.7	-	-
Copper	5.0 ug/g	30.0	49.3	34.7	55.2	-	-
Lead	1.0 ug/g	50.5	143	13.6	166	-	-
Mercury	0.1 ug/g	<0.1	0.2	<0.1	0.1	-	-
Molybdenum	1.0 ug/g	2.7	4.4	3.2	3.1	-	-
Nickel	5.0 ug/g	48.6	43.1	48.7	28.2	-	-
Selenium	1.0 ug/g	1.4	1.6	<1.0	1.2	-	-
Silver	0.3 ug/g	<0.3	0.5	<0.3	<0.3	-	-
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Uranium	1.0 ug/g	1.4	1.6	1.4	1.3	-	-
Vanadium	10.0 ug/g	43.2	34.1	34.9	27.1	-	-

	Client ID:	BH1-24-SS2	BH2-24-SS2	BH2-24-SS3	BH3-24-SS2	-	-
	Sample Date:	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00		
	Sample ID:	2414243-01	2414243-03	2414243-04	2414243-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Metals							
Zinc	20.0 ug/g	54.1	182	42.8	174	-	-
Volatiles							
Benzene	0.02 ug/g	<0.02	<0.02	-	<0.02	-	-
Ethylbenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Toluene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
m,p-Xylenes	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
o-Xylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Xylenes, total	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Toluene-d8	Surrogate	98.3%	97.6%	-	94.9%	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	<7	-	<7	-	-
F2 PHCs (C10-C16)	4 ug/g	<4	16	-	11	-	-
F3 PHCs (C16-C34)	8 ug/g	40	155	-	89	-	-
F4 PHCs (C34-C50)	6 ug/g	50	61	-	64	-	-
Semi-Volatiles							
Acenaphthene	0.02 ug/g	<0.02	1.57	0.04	0.06	-	-
Acenaphthylene	0.02 ug/g	<0.02	<0.40 [1]	<0.02	0.08	-	-
Anthracene	0.02 ug/g	<0.02	5.20	0.16	0.23	-	-
Benzo [a] anthracene	0.02 ug/g	<0.02	7.04	0.23	0.57	-	-
Benzo [a] pyrene	0.02 ug/g	<0.02	5.31	0.16	0.42	-	-
Benzo [b] fluoranthene	0.02 ug/g	<0.02	4.88	0.16	0.46	-	-
Benzo [g,h,i] perylene	0.02 ug/g	<0.02	2.70	0.10	0.25	-	-
Benzo [k] fluoranthene	0.02 ug/g	<0.02	2.95	0.10	0.29	-	-
Chrysene	0.02 ug/g	<0.02	6.44	0.26	0.55	-	-
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	0.81	0.02	0.07	-	-

	Client ID:	BH1-24-SS2	BH2-24-SS2	BH2-24-SS3	BH3-24-SS2	-	-
	Sample Date:	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00		
	Sample ID:	2414243-01	2414243-03	2414243-04	2414243-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
Fluoranthene	0.02 ug/g	<0.02	20.7	0.66	1.30	-	-
Fluorene	0.02 ug/g	<0.02	1.95	0.04	0.06	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g	<0.02	2.47	0.08	0.24	-	-
1-Methylnaphthalene	0.02 ug/g	<0.02	<0.40 [1]	<0.02	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g	<0.02	<0.40 [1]	<0.02	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g	<0.04	<0.80 [1]	<0.04	<0.04	-	-
Naphthalene	0.01 ug/g	<0.01	0.51	0.01	0.02	-	-
Phenanthrene	0.02 ug/g	<0.02	17.2	0.44	0.81	-	-
Pyrene	0.02 ug/g	<0.02	16.2	0.51	1.13	-	-
2-Fluorobiphenyl	Surrogate	61.5%	53.7%	53.0%	64.1%	-	-
Terphenyl-d14	Surrogate	68.0%	61.2%	67.8%	68.7%	-	-

	Client ID:	BH3-24-SS3	BH4-24-SS2	BH5-24-SS2	BH8-24-SS2	-	-
	Sample Date:	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00		
	Sample ID:	2414243-06	2414243-07	2414243-08	2414243-11		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	84.6	90.4	83.1	86.5	-	-
General Inorganics							
SAR	0.01 N/A	-	16.8	-	-	-	-
Conductivity	5 uS/cm	-	3450	-	-	-	-
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Arsenic	1.0 ug/g	5.8	4.4	5.8	6.9	-	-
Barium	1.0 ug/g	78.2	62.7	114	87.3	-	-
Beryllium	0.5 ug/g	0.7	<0.5	0.9	0.8	-	-
Boron	5.0 ug/g	7.5	7.2	12.6	13.5	-	-
Cadmium	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	-	-
Chromium	5.0 ug/g	27.3	16.0	38.8	28.8	-	-
Chromium (VI)	0.2 ug/g	0.7	0.6	<0.2	0.3	-	-
Cobalt	1.0 ug/g	12.6	6.2	13.0	14.0	-	-
Copper	5.0 ug/g	28.1	19.5	33.3	31.3	-	-
Lead	1.0 ug/g	14.2	23.6	40.0	13.9	-	-
Mercury	0.1 ug/g	<0.1	<0.1	<0.1	<0.1	-	-
Molybdenum	1.0 ug/g	2.9	2.3	2.6	2.8	-	-
Nickel	5.0 ug/g	33.9	18.2	41.7	50.7	-	-
Selenium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Silver	0.3 ug/g	<0.3	<0.3	<0.3	<0.3	-	-
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Uranium	1.0 ug/g	1.6	<1.0	1.3	1.3	-	-
Vanadium	10.0 ug/g	32.8	19.0	47.7	37.7	-	-
Zinc	20.0 ug/g	38.9	42.0	64.3	40.1	-	-

Certificate of Analysis

Report Date: 16-Apr-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 3-Apr-2024

Client PO: **59923**

Project Description: **PE5651**

	Client ID:	BH3-24-SS3	BH4-24-SS2	BH5-24-SS2	BH8-24-SS2	-	-
	Sample Date:	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00		
	Sample ID:	2414243-06	2414243-07	2414243-08	2414243-11		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
Benzene	0.02 ug/g	-	<0.02	-	-	-	-
Ethylbenzene	0.05 ug/g	-	<0.05	-	-	-	-
Toluene	0.05 ug/g	-	<0.05	-	-	-	-
m,p-Xylenes	0.05 ug/g	-	<0.05	-	-	-	-
o-Xylene	0.05 ug/g	-	<0.05	-	-	-	-
Xylenes, total	0.05 ug/g	-	<0.05	-	-	-	-
Toluene-d8	Surrogate	-	92.0%	-	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	-	<7	-	-	-	-
F2 PHCs (C10-C16)	4 ug/g	-	11	-	-	-	-
F3 PHCs (C16-C34)	8 ug/g	-	52	-	-	-	-
F4 PHCs (C34-C50)	6 ug/g	-	37	-	-	-	-
Semi-Volatiles							
Acenaphthene	0.02 ug/g	<0.02	0.07	0.02	<0.02	-	-
Acenaphthylene	0.02 ug/g	<0.02	0.04	0.09	<0.02	-	-
Anthracene	0.02 ug/g	<0.02	0.24	0.09	<0.02	-	-
Benzo [a] anthracene	0.02 ug/g	<0.02	0.47	0.26	<0.02	-	-
Benzo [a] pyrene	0.02 ug/g	<0.02	0.36	0.25	<0.02	-	-
Benzo [b] fluoranthene	0.02 ug/g	<0.02	0.36	0.19	<0.02	-	-
Benzo [g,h,i] perylene	0.02 ug/g	<0.02	0.23	0.14	<0.02	-	-
Benzo [k] fluoranthene	0.02 ug/g	<0.02	0.22	0.10	<0.02	-	-
Chrysene	0.02 ug/g	<0.02	0.40	0.28	<0.02	-	-
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	0.06	0.03	<0.02	-	-
Fluoranthene	0.02 ug/g	<0.02	1.22	0.62	0.02	-	-
Fluorene	0.02 ug/g	<0.02	0.10	0.03	<0.02	-	-

	Client ID:	BH3-24-SS3	BH4-24-SS2	BH5-24-SS2	BH8-24-SS2	-	-
	Sample Date:	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00	01-Apr-24 09:00		
	Sample ID:	2414243-06	2414243-07	2414243-08	2414243-11		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
Indeno [1,2,3-cd] pyrene	0.02 ug/g	<0.02	0.21	0.11	<0.02	-	-
1-Methylnaphthalene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g	<0.02	0.03	<0.02	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g	<0.04	0.05	<0.04	<0.04	-	-
Naphthalene	0.01 ug/g	<0.01	0.06	<0.01	<0.01	-	-
Phenanthrene	0.02 ug/g	<0.02	0.85	0.21	0.02	-	-
Pyrene	0.02 ug/g	<0.02	1.01	0.57	<0.02	-	-
2-Fluorobiphenyl	Surrogate	67.5%	61.8%	60.6%	68.8%	-	-
Terphenyl-d14	Surrogate	85.0%	66.3%	74.8%	83.5%	-	-

	Client ID:	DUP1				-	-
	Sample Date:	01-Apr-24 09:00					
	Sample ID:	2414243-12					
	Matrix:	Soil					
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	75.4	-	-	-	-	-
Metals							
Antimony	1.0 ug/g	<1.0	-	-	-	-	-
Arsenic	1.0 ug/g	3.3	-	-	-	-	-
Barium	1.0 ug/g	121	-	-	-	-	-
Beryllium	0.5 ug/g	0.8	-	-	-	-	-
Boron	5.0 ug/g	9.6	-	-	-	-	-
Cadmium	0.5 ug/g	<0.5	-	-	-	-	-
Chromium	5.0 ug/g	27.7	-	-	-	-	-
Cobalt	1.0 ug/g	8.1	-	-	-	-	-
Copper	5.0 ug/g	17.0	-	-	-	-	-
Lead	1.0 ug/g	115	-	-	-	-	-
Molybdenum	1.0 ug/g	<1.0	-	-	-	-	-
Nickel	5.0 ug/g	29.1	-	-	-	-	-
Selenium	1.0 ug/g	<1.0	-	-	-	-	-
Silver	0.3 ug/g	<0.3	-	-	-	-	-
Thallium	1.0 ug/g	<1.0	-	-	-	-	-
Uranium	1.0 ug/g	1.0	-	-	-	-	-
Vanadium	10.0 ug/g	30.4	-	-	-	-	-
Zinc	20.0 ug/g	58.5	-	-	-	-	-
Volatiles							
Benzene	0.02 ug/g	<0.02	-	-	-	-	-
Ethylbenzene	0.05 ug/g	<0.05	-	-	-	-	-
Toluene	0.05 ug/g	<0.05	-	-	-	-	-
m,p-Xylenes	0.05 ug/g	<0.05	-	-	-	-	-

	Client ID:	DUP1				-	-
	Sample Date:	01-Apr-24 09:00					
	Sample ID:	2414243-12					
	Matrix:	Soil					
	MDL/Units						
Volatiles							
o-Xylene	0.05 ug/g	<0.05	-	-	-	-	-
Xylenes, total	0.05 ug/g	<0.05	-	-	-	-	-
Toluene-d8	Surrogate	101%	-	-	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	-	-	-	-	-
F2 PHCs (C10-C16)	4 ug/g	10	-	-	-	-	-
F3 PHCs (C16-C34)	8 ug/g	155	-	-	-	-	-
F4 PHCs (C34-C50)	6 ug/g	148	-	-	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics								
Conductivity	ND	5	uS/cm					
Hydrocarbons								
F1 PHCs (C6-C10)	ND	7	ug/g					
F2 PHCs (C10-C16)	ND	4	ug/g					
F3 PHCs (C16-C34)	ND	8	ug/g					
F4 PHCs (C34-C50)	ND	6	ug/g					
Metals								
Antimony	ND	1.0	ug/g					
Arsenic	ND	1.0	ug/g					
Barium	ND	1.0	ug/g					
Beryllium	ND	0.5	ug/g					
Boron	ND	5.0	ug/g					
Cadmium	ND	0.5	ug/g					
Chromium (VI)	ND	0.2	ug/g					
Chromium	ND	5.0	ug/g					
Cobalt	ND	1.0	ug/g					
Copper	ND	5.0	ug/g					
Lead	ND	1.0	ug/g					
Mercury	ND	0.1	ug/g					
Molybdenum	ND	1.0	ug/g					
Nickel	ND	5.0	ug/g					
Selenium	ND	1.0	ug/g					
Silver	ND	0.3	ug/g					
Thallium	ND	1.0	ug/g					
Uranium	ND	1.0	ug/g					
Vanadium	ND	10.0	ug/g					
Zinc	ND	20.0	ug/g					
Semi-Volatiles								
Acenaphthene	ND	0.02	ug/g					
Acenaphthylene	ND	0.02	ug/g					
Anthracene	ND	0.02	ug/g					
Benzo [a] anthracene	ND	0.02	ug/g					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] pyrene	ND	0.02	ug/g					
Benzo [b] fluoranthene	ND	0.02	ug/g					
Benzo [g,h,i] perylene	ND	0.02	ug/g					
Benzo [k] fluoranthene	ND	0.02	ug/g					
Chrysene	ND	0.02	ug/g					
Dibenzo [a,h] anthracene	ND	0.02	ug/g					
Fluoranthene	ND	0.02	ug/g					
Fluorene	ND	0.02	ug/g					
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g					
1-Methylnaphthalene	ND	0.02	ug/g					
2-Methylnaphthalene	ND	0.02	ug/g					
Methylnaphthalene (1&2)	ND	0.04	ug/g					
Naphthalene	ND	0.01	ug/g					
Phenanthrene	ND	0.02	ug/g					
Pyrene	ND	0.02	ug/g					
Surrogate: 2-Fluorobiphenyl	*0.847*		*%*	*63.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.09*		*%*	*81.9*	*50-140*			
Volatiles								
Benzene	ND	0.02	ug/g					
Ethylbenzene	ND	0.05	ug/g					
Toluene	ND	0.05	ug/g					
m,p-Xylenes	ND	0.05	ug/g					
o-Xylene	ND	0.05	ug/g					
Xylenes, total	ND	0.05	ug/g					
Surrogate: Toluene-d8	*6.78*		*%*	*84.7*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	2.24	0.01	N/A	2.10			6.5	30	
Conductivity	3260	5	uS/cm	3270			0.4	5	
pH	7.24	0.05	pH Units	7.26			0.3	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	29	8	ug/g	40			30.5	30	QR-04
F4 PHCs (C34-C50)	34	6	ug/g	50			38.0	30	QR-04
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	1.2	1.0	ug/g	1.3			9.9	30	
Barium	117	1.0	ug/g	120			2.7	30	
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron	20.6	5.0	ug/g	22.0			6.5	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	0.3	0.2	ug/g	0.4			8.0	35	
Chromium	10.4	5.0	ug/g	11.0			5.8	30	
Cobalt	4.5	1.0	ug/g	4.6			3.2	30	
Copper	6.2	5.0	ug/g	6.4			4.0	30	
Lead	8.0	1.0	ug/g	8.5			6.0	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	10.0	5.0	ug/g	10.4			4.5	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	ND	10.0	ug/g	ND			NC	30	
Zinc	ND	20.0	ug/g	ND			NC	30	
Physical Characteristics									

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
% Solids	97.2	0.1	% by Wt.	97.1			0.1	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	0.021			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	0.036	0.02	ug/g	0.030			17.2	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	0.023			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	0.022			NC	40	
Pyrene	0.047	0.02	ug/g	0.043			9.2	40	
Surrogate: 2-Fluorobiphenyl	*0.891*		*%*		*64.0*	*50-140*			
Surrogate: Terphenyl-d14	*1.04*		*%*		*74.7*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*8.08*		*%*		*91.3*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	177	7	ug/g	ND	103	85-115			
F2 PHCs (C10-C16)	130	4	ug/g	ND	135	60-140			
F3 PHCs (C16-C34)	369	8	ug/g	40	140	60-140			
F4 PHCs (C34-C50)	258	6	ug/g	50	139	60-140			
Metals									
Antimony	20.7	1.0	ug/g	ND	41.4	70-130			
Arsenic	45.0	1.0	ug/g	ND	89.0	70-130			
Barium	94.4	1.0	ug/g	48.0	92.8	70-130			
Beryllium	54.5	0.5	ug/g	ND	109	70-130			
Boron	60.1	5.0	ug/g	8.8	103	70-130			
Cadmium	45.3	0.5	ug/g	ND	90.6	70-130			
Chromium (VI)	4.5	0.2	ug/g	0.4	72.0	70-130			
Chromium	51.9	5.0	ug/g	ND	95.1	70-130			
Cobalt	48.1	1.0	ug/g	1.8	92.5	70-130			
Copper	45.0	5.0	ug/g	ND	84.9	70-130			
Lead	40.5	1.0	ug/g	3.4	74.2	70-130			
Mercury	1.35	0.1	ug/g	ND	89.8	70-130			
Molybdenum	43.9	1.0	ug/g	ND	87.3	70-130			
Nickel	48.7	5.0	ug/g	ND	89.1	70-130			
Selenium	46.6	1.0	ug/g	ND	92.8	70-130			
Silver	40.6	0.3	ug/g	ND	81.3	70-130			
Thallium	42.9	1.0	ug/g	ND	85.6	70-130			
Uranium	43.7	1.0	ug/g	ND	87.0	70-130			
Vanadium	53.3	10.0	ug/g	ND	99.5	70-130			
Zinc	43.9	20.0	ug/g	ND	80.0	70-130			
Semi-Volatiles									
Acenaphthene	0.173	0.02	ug/g	ND	99.3	50-140			
Acenaphthylene	0.201	0.02	ug/g	0.021	103	50-140			
Anthracene	0.202	0.02	ug/g	ND	116	50-140			
Benzo [a] anthracene	0.197	0.02	ug/g	ND	113	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] pyrene	0.154	0.02	ug/g	ND	88.7	50-140			
Benzo [b] fluoranthene	0.191	0.02	ug/g	ND	110	50-140			
Benzo [g,h,i] perylene	0.157	0.02	ug/g	0.030	72.7	50-140			
Benzo [k] fluoranthene	0.194	0.02	ug/g	ND	111	50-140			
Chrysene	0.190	0.02	ug/g	ND	109	50-140			
Dibenzo [a,h] anthracene	0.138	0.02	ug/g	ND	79.3	50-140			
Fluoranthene	0.187	0.02	ug/g	ND	108	50-140			
Fluorene	0.169	0.02	ug/g	ND	97.2	50-140			
Indeno [1,2,3-cd] pyrene	0.149	0.02	ug/g	ND	85.9	50-140			
1-Methylnaphthalene	0.163	0.02	ug/g	0.023	80.1	50-140			
2-Methylnaphthalene	0.168	0.02	ug/g	ND	96.3	50-140			
Naphthalene	0.169	0.01	ug/g	ND	96.9	50-140			
Phenanthrene	0.197	0.02	ug/g	0.022	101	50-140			
Pyrene	0.212	0.02	ug/g	0.043	97.3	50-140			
Surrogate: 2-Fluorobiphenyl	*1.05*		*%*		*75.2*	*50-140*			
Surrogate: Terphenyl-d14	*0.985*		*%*		*70.7*	*50-140*			
Volatiles									
Benzene	4.15	0.02	ug/g	ND	104	60-130			
Ethylbenzene	3.94	0.05	ug/g	ND	98.5	60-130			
Toluene	4.40	0.05	ug/g	ND	110	60-130			
m,p-Xylenes	7.87	0.05	ug/g	ND	98.3	60-130			
o-Xylene	4.11	0.05	ug/g	ND	103	60-130			
Surrogate: Toluene-d8	*6.40*		*%*		*80.0*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1: Elevated reporting limit due to dilution required because of high target analyte concentration.

QC Qualifiers:

QR-04 Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions:

None

Certificate of Analysis

Report Date: 16-Apr-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 3-Apr-2024

Client PO: 59923

Project Description: PE5651

Work Order Revisions / Comments:

Revision 1 - Revised report includes additional metals and PAH analyses on hold samples.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unlesss otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.

- F1 range corrected for BTEX.

- F2 to F3 ranges corrected for appropriate PAHs where available.

- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.

- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

- When reported, data for F4G has been processed using a silica gel cleanup.

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2414243	

Client Name: Paterson Group	Project Ref: PE5651	Page 1 of 2
Contact Name: Nick Sullivan	Quote #:	Turnaround Time
Address: 9 Auriga Drive, Ottawa, Ontario, K2E 7T9	PO #: 59838	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-226-7381	E-mail: nsullivan@patersongroup.ca	Date Required:

☒ REG 153/04 ☐ REG 406/19

☐ Table 1 ☒ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☒ Coarse
☒ Table 3 ☐ Agri/Other
☐ Table
For RSC: ☒ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm
Mun:
☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	BTEX	PHCs F1-F4	PAHs	ICP Metals	Chromium VI	Mercury	EC	SAR	pH			HOLD
1	BH1-24-SS2	S		2	April 1, 2024		✔	✔	✔	✔	✔	✔	✔	✔	✔			
2	~~BH1-24-SS3~~ BH1-24-SS3A	S		2														✔
3	BH2-24-SS2	S		2			✔	✔	✔	✔	✔	✔	✔	✔				
4	BH2-24-SS3	S		2											✔			✔
5	BH3-24-SS2	S		2			✔	✔	✔	✔	✔	✔	✔	✔				
6	BH3-24-SS3	S		2														✔
7	BH4-24-SS2	S		2			✔	✔	✔	✔	✔	✔	✔	✔				
8	BH5-24-SS2	S		2														✔
9	BH6-24-SS2	S		2														✔
10	BH7-24-SS2	S		2														✔

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): N. Sullivan	Received at Depot:	Received at Lab: SD	Verified By: SD
Relinquished By (Print): Nick Sullivan	Date/Time:	Date/Time: April 3, 2024 4:34pm	Date/Time: April 3, 2024 4:54pm
Date/Time: April 2, 2024 @ 3:30 PM	Temperature: °C	Temperature: 3.9	pH Verified: ☐ By:

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2414243	

Client Name: Paterson Group	Project Ref: PE5651	Page 2 of 2
Contact Name: Nick Sullivan	Quote #:	
Address: 9 Auriga Drive, Ottawa, Ontario, K2E 7T9	PO #: 59838	Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-226-7381	E-mail: nsullivan@patersongroup.ca	Date Required:

☒ REG 153/04 ☐ REG 406/19

☐ Table 1 ☒ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☒ Coarse
☒ Table 3 ☐ Agri/Other
☐ Table
For RSC: ☒ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm
Mun:
☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	BTEX	PHCs F1-F4	PAHs	ICP Metals	Chromium VI	Mercury	EC	SAR	pH			HOLD
1	BH8-24-SS2	S		2	April 1, 2024													✔
2	DUP1	S		2	↓		✔	✔		✔								
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): N. Sullivan	Received at Depot:	Received at Lab: SD	Verified By: SD
Relinquished By (Print): Nick Sullivan	Date/Time:	Date/Time: April 3 2024 4:30pm	Date/Time: April 3 2024 4:54pm
Date/Time: April 2, 2024 @ 3:30 PM	Temperature: °C	Temperature: 3.9	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers (Ottawa)
9 Auriga Drive
Ottawa, ON K2E 7T9
Attn: Nick Sullivan

Client PO: 59967
Project: PE5651
Custody:

Report Date: 19-Apr-2024
Order Date: 15-Apr-2024

Order #: 2416079

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2416079-01	BH1-24-GW1
2416079-02	BH2-24-GW1
2416079-03	BH3-22-GW2
2416079-04	DUP
2416079-05	Trip Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	16-Apr-24	17-Apr-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	17-Apr-24	18-Apr-24
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	17-Apr-24	18-Apr-24
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	16-Apr-24	17-Apr-24

Certificate of Analysis

Report Date: 19-Apr-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 15-Apr-2024

Client PO: **59967**

Project Description: PE5651

	Client ID:	BH1-24-GW1	BH2-24-GW1	BH3-22-GW2	DUP	-	-
	Sample Date:	12-Apr-24 09:00	12-Apr-24 09:00	12-Apr-24 09:00	12-Apr-24 09:00		
	Sample ID:	2416079-01	2416079-02	2416079-03	2416079-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Volatiles							
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Ethylene dibromide (dibromoethane,	0.2 ug/L	<0.2	<0.2	<0.2	<0.2	-	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0	-	-

Certificate of Analysis

Report Date: 19-Apr-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 15-Apr-2024

Client PO: **59967**

Project Description: **PE5651**

	Client ID:	BH1-24-GW1	BH2-24-GW1	BH3-22-GW2	DUP	-	-
	Sample Date:	12-Apr-24 09:00	12-Apr-24 09:00	12-Apr-24 09:00	12-Apr-24 09:00		
	Sample ID:	2416079-01	2416079-02	2416079-03	2416079-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Volatiles							
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	105%	104%	104%	105%	-	-
Toluene-d8	Surrogate	104%	103%	103%	104%	-	-
Dibromofluoromethane	Surrogate	116%	117%	121%	120%	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-	-	-

	Client ID:	BH1-24-GW1	BH2-24-GW1	BH3-22-GW2	DUP	-	-
	Sample Date:	12-Apr-24 09:00	12-Apr-24 09:00	12-Apr-24 09:00	12-Apr-24 09:00		
	Sample ID:	2416079-01	2416079-02	2416079-03	2416079-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Semi-Volatiles							
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	<0.01	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Fluoranthene	0.01 ug/L	<0.01	<0.01	<0.01	-	-	-
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	<0.05	<0.05	-	-	-
Pyrene	0.01 ug/L	<0.01	<0.01	<0.01	-	-	-
2-Fluorobiphenyl	Surrogate	72.9%	67.4%	66.7%	-	-	-
Terphenyl-d14	Surrogate	86.6%	83.9%	81.9%	-	-	-

	Client ID:	Trip Blank				-	-
	Sample Date:	06-Apr-24 09:00					
	Sample ID:	2416079-05					
	Matrix:	Water					
	MDL/Units						
Volatiles							
Acetone	5.0 ug/L	<5.0	-	-	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-	-	-
Ethylene dibromide (dibromoethane,	0.2 ug/L	<0.2	-	-	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-	-	-

	Client ID:	Trip Blank				-	-
	Sample Date:	06-Apr-24 09:00					
	Sample ID:	2416079-05					
	Matrix:	Water					
	MDL/Units						
Volatiles							
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-	-	-
Toluene-d8	Surrogate	104%	-	-	-	-	-
Dibromofluoromethane	Surrogate	113%	-	-	-	-	-
4-Bromofluorobenzene	Surrogate	103%	-	-	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons								
F1 PHCs (C6-C10)	ND	25	ug/L					
F2 PHCs (C10-C16)	ND	100	ug/L					
F3 PHCs (C16-C34)	ND	100	ug/L					
F4 PHCs (C34-C50)	ND	100	ug/L					
Semi-Volatiles								
Acenaphthene	ND	0.05	ug/L					
Acenaphthylene	ND	0.05	ug/L					
Anthracene	ND	0.01	ug/L					
Benzo [a] anthracene	ND	0.01	ug/L					
Benzo [a] pyrene	ND	0.01	ug/L					
Benzo [b] fluoranthene	ND	0.05	ug/L					
Benzo [g,h,i] perylene	ND	0.05	ug/L					
Benzo [k] fluoranthene	ND	0.05	ug/L					
Chrysene	ND	0.05	ug/L					
Dibenzo [a,h] anthracene	ND	0.05	ug/L					
Fluoranthene	ND	0.01	ug/L					
Fluorene	ND	0.05	ug/L					
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L					
1-Methylnaphthalene	ND	0.05	ug/L					
2-Methylnaphthalene	ND	0.05	ug/L					
Methylnaphthalene (1&2)	ND	0.10	ug/L					
Naphthalene	ND	0.05	ug/L					
Phenanthrene	ND	0.05	ug/L					
Pyrene	ND	0.01	ug/L					
Surrogate: 2-Fluorobiphenyl	*13.1*		*%*	*65.4*	*50-140*			
Surrogate: Terphenyl-d14	*18.0*		*%*	*89.8*	*50-140*			
Volatiles								
Acetone	ND	5.0	ug/L					
Benzene	ND	0.5	ug/L					
Bromodichloromethane	ND	0.5	ug/L					
Bromoform	ND	0.5	ug/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromomethane	ND	0.5	ug/L					
Carbon Tetrachloride	ND	0.2	ug/L					
Chlorobenzene	ND	0.5	ug/L					
Chloroform	ND	0.5	ug/L					
Dibromochloromethane	ND	0.5	ug/L					
Dichlorodifluoromethane	ND	1.0	ug/L					
1,2-Dichlorobenzene	ND	0.5	ug/L					
1,3-Dichlorobenzene	ND	0.5	ug/L					
1,4-Dichlorobenzene	ND	0.5	ug/L					
1,1-Dichloroethane	ND	0.5	ug/L					
1,2-Dichloroethane	ND	0.5	ug/L					
1,1-Dichloroethylene	ND	0.5	ug/L					
cis-1,2-Dichloroethylene	ND	0.5	ug/L					
trans-1,2-Dichloroethylene	ND	0.5	ug/L					
1,2-Dichloropropane	ND	0.5	ug/L					
cis-1,3-Dichloropropylene	ND	0.5	ug/L					
trans-1,3-Dichloropropylene	ND	0.5	ug/L					
1,3-Dichloropropene, total	ND	0.5	ug/L					
Ethylbenzene	ND	0.5	ug/L					
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.2	ug/L					
Hexane	ND	1.0	ug/L					
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L					
Methyl Isobutyl Ketone	ND	5.0	ug/L					
Methyl tert-butyl ether	ND	2.0	ug/L					
Methylene Chloride	ND	5.0	ug/L					
Styrene	ND	0.5	ug/L					
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L					
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L					
Tetrachloroethylene	ND	0.5	ug/L					
Toluene	ND	0.5	ug/L					
1,1,1-Trichloroethane	ND	0.5	ug/L					
1,1,2-Trichloroethane	ND	0.5	ug/L					
Trichloroethylene	ND	0.5	ug/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Trichlorofluoromethane	ND	1.0	ug/L					
Vinyl chloride	ND	0.5	ug/L					
m,p-Xylenes	ND	0.5	ug/L					
o-Xylene	ND	0.5	ug/L					
Xylenes, total	ND	0.5	ug/L					
Surrogate: 4-Bromofluorobenzene	*77.1*		*%*	*96.4*	*50-140*			
Surrogate: Dibromofluoromethane	*66.3*		*%*	*82.9*	*50-140*			
Surrogate: Toluene-d8	*83.6*		*%*	*105*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*82.4*		*%*		*103*	*50-140*			
Surrogate: Dibromofluoromethane	*93.1*		*%*		*116*	*50-140*			
Surrogate: Toluene-d8	*82.5*		*%*		*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1880	25	ug/L	ND	109	85-115			
F2 PHCs (C10-C16)	1900	100	ug/L	ND	119	60-140			
F3 PHCs (C16-C34)	4690	100	ug/L	ND	120	60-140			
F4 PHCs (C34-C50)	2630	100	ug/L	ND	106	60-140			
Semi-Volatiles									
Acenaphthene	3.50	0.05	ug/L	ND	70.0	50-140			
Acenaphthylene	3.88	0.05	ug/L	ND	77.5	50-140			
Anthracene	4.29	0.01	ug/L	ND	85.9	50-140			
Benzo [a] anthracene	3.92	0.01	ug/L	ND	78.4	50-140			
Benzo [a] pyrene	3.08	0.01	ug/L	ND	61.7	50-140			
Benzo [b] fluoranthene	3.91	0.05	ug/L	ND	78.2	50-140			
Benzo [g,h,i] perylene	3.11	0.05	ug/L	ND	62.1	50-140			
Benzo [k] fluoranthene	4.36	0.05	ug/L	ND	87.3	50-140			
Chrysene	4.10	0.05	ug/L	ND	81.9	50-140			
Dibenzo [a,h] anthracene	3.14	0.05	ug/L	ND	62.9	50-140			
Fluoranthene	4.22	0.01	ug/L	ND	84.5	50-140			
Fluorene	3.57	0.05	ug/L	ND	71.5	50-140			
Indeno [1,2,3-cd] pyrene	3.36	0.05	ug/L	ND	67.1	50-140			
1-Methylnaphthalene	3.63	0.05	ug/L	ND	72.6	50-140			
2-Methylnaphthalene	3.83	0.05	ug/L	ND	76.7	50-140			
Naphthalene	3.93	0.05	ug/L	ND	78.7	50-140			
Phenanthrene	3.90	0.05	ug/L	ND	77.9	50-140			
Pyrene	4.33	0.01	ug/L	ND	86.6	50-140			
Surrogate: 2-Fluorobiphenyl	*13.8*		*%*		*69.1*	*50-140*			
Surrogate: Terphenyl-d14	*18.1*		*%*		*90.7*	*50-140*			
Volatiles									
Acetone	101	5.0	ug/L	ND	101	50-140			
Benzene	43.0	0.5	ug/L	ND	108	60-130			
Bromodichloromethane	38.5	0.5	ug/L	ND	96.4	60-130			
Bromoform	36.4	0.5	ug/L	ND	91.1	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromomethane	42.4	0.5	ug/L	ND	106	50-140			
Carbon Tetrachloride	35.2	0.2	ug/L	ND	88.1	60-130			
Chlorobenzene	41.9	0.5	ug/L	ND	105	60-130			
Chloroform	42.0	0.5	ug/L	ND	105	60-130			
Dibromochloromethane	38.2	0.5	ug/L	ND	95.5	60-130			
Dichlorodifluoromethane	31.0	1.0	ug/L	ND	77.5	50-140			
1,2-Dichlorobenzene	39.5	0.5	ug/L	ND	98.7	60-130			
1,3-Dichlorobenzene	38.8	0.5	ug/L	ND	97.1	60-130			
1,4-Dichlorobenzene	39.0	0.5	ug/L	ND	97.6	60-130			
1,1-Dichloroethane	45.7	0.5	ug/L	ND	114	60-130			
1,2-Dichloroethane	45.2	0.5	ug/L	ND	113	60-130			
1,1-Dichloroethylene	42.3	0.5	ug/L	ND	106	60-130			
cis-1,2-Dichloroethylene	42.8	0.5	ug/L	ND	107	60-130			
trans-1,2-Dichloroethylene	41.4	0.5	ug/L	ND	104	60-130			
1,2-Dichloropropane	42.4	0.5	ug/L	ND	106	60-130			
cis-1,3-Dichloropropylene	36.2	0.5	ug/L	ND	90.6	60-130			
trans-1,3-Dichloropropylene	33.5	0.5	ug/L	ND	83.7	60-130			
Ethylbenzene	43.0	0.5	ug/L	ND	108	60-130			
Ethylene dibromide (dibromoethane, 1,2-)	44.9	0.2	ug/L	ND	112	60-130			
Hexane	33.6	1.0	ug/L	ND	84.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	92.5	5.0	ug/L	ND	92.5	50-140			
Methyl Isobutyl Ketone	87.5	5.0	ug/L	ND	87.5	50-140			
Methyl tert-butyl ether	104	2.0	ug/L	ND	104	50-140			
Methylene Chloride	46.7	5.0	ug/L	ND	117	60-130			
Styrene	38.3	0.5	ug/L	ND	95.8	60-130			
1,1,1,2-Tetrachloroethane	35.0	0.5	ug/L	ND	87.6	60-130			
1,1,2,2-Tetrachloroethane	34.4	0.5	ug/L	ND	86.1	60-130			
Tetrachloroethylene	38.4	0.5	ug/L	ND	96.0	60-130			
Toluene	43.8	0.5	ug/L	ND	109	60-130			
1,1,1-Trichloroethane	36.8	0.5	ug/L	ND	92.0	60-130			
1,1,2-Trichloroethane	39.5	0.5	ug/L	ND	98.8	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Trichloroethylene	40.6	0.5	ug/L	ND	102	60-130			
Trichlorofluoromethane	43.3	1.0	ug/L	ND	108	60-130			
Vinyl chloride	33.0	0.5	ug/L	ND	82.6	50-140			
m,p-Xylenes	82.2	0.5	ug/L	ND	103	60-130			
o-Xylene	42.8	0.5	ug/L	ND	107	60-130			
Surrogate: 4-Bromofluorobenzene	*80.2*		*%*		*100*	*50-140*			
Surrogate: Dibromofluoromethane	*89.7*		*%*		*112*	*50-140*			
Surrogate: Toluene-d8	*82.4*		*%*		*103*	*50-140*			

Certificate of Analysis

Report Date: 19-Apr-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 15-Apr-2024

Client PO: **59967**

Project Description: PE5651

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.

- F1 range corrected for BTEX.

- F2 to F3 ranges corrected for appropriate PAHs where available.

- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.

- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2416079

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2416079	

Client Name:	Paterson Group	Project Ref: PE5651	Page 1 of 1
Contact Name:	Nick Sullivan	Quote #:	**Turnaround Time**
Address:	9 Auriga Drive Ottawa, Ontario, K2E 7T9	PO #: 59967	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone:	613-226-7381	E-mail: nsullivan@patersongroup.ca	Date Required:

☒ REG 153/04 ☐ REG 406/19

☐ Table 1 ☒ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☒ Coarse
☐ Table 3 ☐ Agri/Other
☒ Table 7
For RSC: ☒ Yes ☐ No

Other Regulation

☐ REG 558 ☐ PWQO
☐ CCME ☐ MISA
☐ SU - Sani ☐ SU - Storm
Mun:
☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs
1	BH1-24-GW1	GW		4	April 12, 2024		✔	✔	✔
2	BH2-24-GW1	GW		4	April 12, 2024		✔	✔	✔
3	BH3-22-GW2	GW		4	April 12, 2024		✔	✔	✔
4	DUP	GW		2	April 12, 2024			✔	
5	Trip Blank	O		1	April 6, 2024			✔	
6									
7									
8									
9									
10									

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): V. Naufal	Received at Depot:	Received at Lab: SD	Verified By: SD
Relinquished By (Print): Vanessa Naufal	Date/Time:	Date/Time: April 15, 2024 3:46p	Date/Time: April 15, 2024 4:22p
Date/Time: April 15, 2024	Temperature: °C	Temperature: 15.4	pH Verified: ☐ By: