PATERSON GROUP

Phase II – Environmental Site Investigation

1440 Blair Towers Place
Ottawa, Ontario

Prepared for Le Groupe Maurice

Report: PE6304-2R
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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the property addressed 1440 Blair Towers Place, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I ESA and considered to result in areas of potential environmental concern (APECs) on the Phase II Property.

The Phase II ESA subsurface investigation, which was conducted in conjunction with a geotechnical investigation, consisted of drilling six boreholes and two hand-dug test pits across the Phase II Property. Two of the boreholes were constructed with groundwater monitoring wells. The general soil profile encountered during the field program consisted of topsoil (0.00-0.23 mbgs), followed by fill material (ranging from 0.10-4.90 mbgs) consisting of brown silty sand with varying amounts of clay, gravel and crushed stone and occasional shale fragments, followed by glacial till (ranging from 1.45-4.98 mbgs) consisting of brown silty sand with gravel, shale fragments, occasional cobbles boulders and trace amounts of clay. Shale bedrock was encountered at depths ranging from 3.76-4.98 mbgs.

A total of seven soil samples (including one duplicate) were submitted for analysis of metals (including As, Sb, Se, Hg and Cr_{VI}), BTEX, PHCs, PAHs, EC, SAR and/or pH. All parameter concentrations analyzed in the soil samples comply with MECP Table 3 Residential Standards.

Groundwater samples (including one duplicate) from monitoring wells installed in BH2-23, BH6-23 and BH4 (installed as part of the Pinchin 2022 Phase II ESA) were collected during the November 15, 2023 sampling event and submitted for laboratory analysis of metals (including As, Sb, Se, Hg and Cr_{VI}), BTEX, PHCs and/or PAHs. All groundwater results comply with the selected MECP Table 3 Standards.

Based on the findings of this Phase II ESA, no further environmental investigation is required.

Recommendations

<u>Groundwater Monitoring Wells</u>

It is our recommendation that the monitoring wells installed on the Phase II Property should remain viable for future monitoring. If they are not going to be used in the future, or will be entirely removed, they should be abandoned according to Ontario Regulation 903. The wells will be registered with the MECP under this regulation.

1.0 INTRODUCTION

At the request of Le Groupe Maurice, Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment for the property addressed 1440 Blair Towers Place, in the City of Ottawa, Ontario. The purpose of this Phase II ESA has been to address areas of potential environmental concern (APECs) identified on the Phase II Property, during the Phase I ESA conducted by Paterson Group in November of 2023.

1.1 Site Description

Address:	1440 Blair Towers Place, Ottawa, Ontario
Legal Description:	Parts 2, 3, of Lot 21, Concession 2 (Ottawa Front); Registered Plan 4R-7647; Geographic Township of Gloucester in the City of Ottawa, Ontario.
Property Identification Number (PIN):	04363-0001 and 04363-0002
Location:	The Phase II Property is located on the southeast quadrant of the Ogilvie Road and Blair Road intersection, in the City of Ottawa, Ontario. Refer to Figure 1 – Key Plan in the Figures section following the text.
Latitude and Longitude:	45º 26’ 05’’ N 75º 36’ 28’’ W

Site Description:

Configuration:	Irregular
Site Area:	1.1 ha (approximate)
Zoning:	TD2 – Transit Oriented Development Zone.
Current Use:	The Phase II Property is primarily vacant land with a paved roadway along the west and north central portions. Based on the activities on the site, the current use is considered to be “community”.
Services:	The Phase I Property is located in a municipally serviced area.

1.2 Property Ownership

Paterson was engaged to conduct this Phase II-ESA by Mr. Benoit Poitras with of Le Groupe Maurice. Mr. Poitras can be reached by telephone at (514)-475-4771.

1.3 Current and Proposed Future Uses

The Phase II Property is currently occupied by predominately vacant (landscaped) land with an asphaltic concrete roadway on the north and west portions. It is our understanding that the Phase II Property will be developed with a high-rise residential apartment building with two levels of underground parking. It is expected that the proposed building will be municipally serviced by the City of Ottawa municipal drinking water distribution network.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 3 of the document entitled “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, prepared by the Ontario Ministry of Environment, Conservation and Parks (MECP), April 2011. The MECP selected Table 3 Standards are based on the following considerations:

- ❒ Coarse-grained soil conditions
- ❒ Full depth generic site conditions
- ❒ Non-potable groundwater conditions
- ❒ Residential land use

Section 35 of O.Reg. 153/04 does apply to the Phase II Property in that properties within the Phase I Study Area rely upon municipal drinking water.

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not within 30m of an environmentally sensitive area.

Section 43.1 of O.Reg. 153/04 does not apply to the Phase II Property in that the property is not a Shallow Soil property and the property is not within 30m of a water body.

The residential standards were selected based on the proposed future use of the Phase II Property. Coarse-grained soil standards were chosen as a conservative approach. Grain size analysis was not completed.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is located on the southeast quadrant of the Ogilvie Road and Blair Road intersection, in the City of Ottawa, Ontario. According to the City of Ottawa website, the Phase II Property is situated in a transit-oriented development zone with surrounding properties consisting of commercial, residential and parkland use.

At the time of the Phase II ESA, the Phase II Property is occupied by predominately vacant (landscaped) land with an asphaltic concrete roadway on the north and west portions. No buildings are present on the Phase II Property. Two billboards are present on the north and west portions of the Phase II Property.

No ponded water, stressed vegetation, surficial staining, or any other indications of potential sub-surface contamination were observed on the Phase II Property at the time of the site inspection.

Site topography is relatively flat whereas the regional topography slopes downwards to the south and west, in the general direction of Green's Creek and the Rideau River, respectively. Most of the Phase II Property is considered to be at grade with respect to Blair Road and Ogilvie Road however, the southmost portion of the property slopes downward and is below the grade of Blair Road.

Water drainage on the Phase II Property occurs primarily via infiltration and surface runoff to catch basins located along the on-site roadway. Groundwater is anticipated to flow in a southeasterly direction towards Green's Creek. However, groundwater flow direction could also be influenced by the Ottawa River, to the north of the Phase II Property.

Multiple underground utilities were identified on the Phase II Property, including fiber optic, hydro, natural gas, water and sewer services.

Two City of Ottawa utility boxes were identified on the north portion of the Phase II Property. Additionally, an underground irrigation (sprinkler system) access panel was identified on the west portion of the Phase II Property.

No other subsurface structures were identified at the time of the site visit.

2.2 Past Investigations

- "*Phase I Environmental Site Assessment, 1400, 1410, 1420 and 1430 Blair Towers Place,* Ottawa, Ontario", prepared by Pinchin Ltd., dated October 26, 2021.

  A Phase I ESA was conducted by Pinchin Ltd. for a large piece of land in October of 2021, the westernmost portion of which comprises the current Phase I Property. At the time of the assessment the portion of the subject property considered the current Phase I Property consisted of vacant land with a road on the west portion. The Phase I ESA did not identify any environmental concerns with regard to the Phase I Property or the surrounding lands. A Phase II ESA was not recommended.

- "*Phase II Environmental Site Assessment, 1400, 1410, 1420 and 1430 Blair Place,* Ottawa, Ontario", prepared by Pinchin Ltd., dated January 20, 2022.

  A Phase II ESA was conducted for the subject property by Pinchin in January of 2022. Although no further work was recommended as part of the Phase I ESA, for due diligence purposes, a Phase II ESA was requested to be conducted to investigate the quality of the on-site soil and groundwater. The investigation consisted of five boreholes drilled in the landscaped areas throughout the 1440 Blair Towers Place property (the current Phase I Property). Soil stratigraphy consisted of native sand and silty sand, silt and till that extended to the maximum borehole completion depth of 3.8 m below ground surface (mbgs). Monitoring wells were installed in the two boreholes present on the central and south portions of the subject property. Five soil samples were submitted for analysis of petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Two groundwater samples from the two monitoring wells were collected and submitted for analysis of PHCs, VOCs, PAHs and metals. Test results for both soil and groundwater were compared to and comply with the Ministry of the Environment, Conservation and Parks (MECP) Table 3 Industrial/Commercial/Community Standards. No further work was recommended.

It should be noted that sample BH1,SS-6 consisted of weathered shale bedrock and was one of the samples submitted for analytical testing. The PHC F2 concentration for BH1,SS-6 (representative of on-site bedrock and not on-site soil exceeds the MECP Table 3 Residential Standard, however, it is our opinion that this exceedance is related to the native shale bedrock present on the Phase II Property and not the soil. As a result, this exceedance is not considered to represent an environmental concern.

- "*Phase I Environmental Site Assessment, 1440 Blair Towers Place,* Ottawa, Ontario", prepared by Paterson Group., dated December 1, 2023.

  Paterson Group completed a Phase I ESA in December of 2023 for the Phase II Property. Based on the findings of the Phase I ESA, two on-site Potentially Contaminating Activities (PCAs) were considered to result in APECs on the Phase II Property. The APECs consist of an asphaltic concrete roadway through the north and west portions of the Phase II Property and the associated use of de-icing agents used for the purpose of safety. A Phase II ESA was recommended to address the aforementioned APECs.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was conducted during the interim of November 7, 2023 through November 8, 2023 in conjunction with a Geotechnical Investigation. The field program consisted of drilling six boreholes and two hand-dug test pits across the Phase II Property. Two of the boreholes (BH2-23 and BH6-23) were instrumented with groundwater monitoring wells. Additional boreholes were drilled as part of the geotechnical investigation. Boreholes were drilled to a maximum depth of 9.20 m below the existing ground surface (mbgs).

3.2 Media Investigated

During the subsurface investigation, soil samples and groundwater samples were obtained and submitted for laboratory analysis. The rationale for sampling and analyzing these media is based on the Contaminants of Potential Concern identified during a review of the 2023 Phase I ESA.

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

- ❒ Petroleum Hydrocarbons, fractions 1 – 4 (PHCs F_1-F_4);
- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);
- ❒ Metals (including As, Sb, Se, Hg and Cr_{VI});
- ❒ Electrical conductivity (EC) and Sodium Adsorption Ratio (SAR).

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

Geological mapping information for the Phase I Property was obtained from The Geological Survey of Canada – Urban Geology of the National Capital Area and reviewed as part of this assessment. Based on the available mapping information, the bedrock beneath the Phase I Property generally consists of shale of the Billings Formation, while the surficial geology consists of till with an overburden ranging in thickness from approximately 1 to 3 m.

Groundwater is anticipated to be encountered within the bedrock and flow in a southeasterly direction towards Green's Creek. However, groundwater flow direction could also be influenced by the Ottawa River, to the north of the Phase I Property.

Buildings and Structures

No buildings are present on the Phase I Property. Two billboards are present on the north and west portions of the Phase I Property.

Subsurface Structures and Utilities

Multiple underground utilities were identified on the Phase I Property, including fiber optic, hydro, natural gas, water and sewer services. An irrigation system was also identified.

Two City of Ottawa utility boxes were identified on the north portion of the Phase I Property. Additionally, an underground irrigation (sprinkler system) access panel was identified on the west portion of the Phase I Property.

No other subsurface structures were identified on the Phase I Property.

Water Bodies and Areas of Natural Significance

No water bodies are present on the Phase I Property. The nearest water body with respect to the Phase I Property is the Ottawa River located approximately 3.2 km to the north.

Drinking Water Wells

A total of two domestic/supply well records were identified within the Phase I Study Area. The first of which pertains to a cooling or air conditioning supply for the property addressed 1200 Montreal Road, approximately 100 m northwest of the Phase I Property. The supply well was installed in 1990 and an associated well abandonment record was identified for May of 1991. As a result of the well abandonment record, this supply well is considered to no longer be in use. The second supply well record, dated May of 2012, was identified for the property addressed 1929 Ogilvie Road (considered part of 1200 Montreal Road), approximately 400 m northwest of the Phase I Property. Based on the development of the 1929 Ogilvie Road property since the date of installation of the well record and the presence of City of Ottawa municipal water services within the Phase I Study Area, it is our opinion that no drinking water wells are expected to remain in use within the Phase I Study Area.

Monitoring Well Records

A total of nine monitoring well records were identified within the Phase I Study Area. The nearest records pertain to the property addressed 1200 Montreal Road, approximately 100 m northwest of the Phase I Property. The well record pertains to five monitoring wells installed in November of 2006. All the remaining monitoring well records pertain to the property addressed 2012 Ogilvie Road, approximately 245 m northeast of the Phase I Property. The 2012 Ogilvie Road well records were installed between December of 2011 and August of 2019. The monitoring well records likely pertain to the former function of the 2012 Ogilvie Road property as a retail fuel outlet and dry cleaner. Based on the separation distance of the 2012 Ogilvie Road property from the Phase I Property (245 m) and the cross-gradient orientation, the former retail fuel outlet and former dry cleaner are considered a potentially contaminating activity (PCA) that does not represent an area of potential environmental concern (APEC) on the Phase I Property.

Based on the reviewed well records, overburden in the vicinity of the Phase I Property consists of sand and/or clay with gravel. Bedrock consisting of shale, was generally encountered at an average depth of approximately 2.5 to 4.5 m below ground surface.

Neighbouring Land Use

Land use within the Phase I Study Area consists of a mixture of residential and commercial properties. PCAs identified during the site inspection include the automotive service garage addressed 2010 Ogilvie Road, approximately 100 m east of the Phase I Property, the retail fuel outlet addressed 2006 Ogilvie Road, approximately 165 m east of the Phase I Property and the retail fuel outlet addressed 1405 Blair Towers Place, approximately 405 m east of the Phase I Property (the west portion of the 1405 Blair Towers Place property parcel is approximately 225 m east of the Phase I Property). Based on the separation distance of the activities of concern associated with the 2010 Ogilvie Road, 2006 Ogilvie Road and 1405 Blair Towers Place properties from the Phase I Property (minimum 100 m) and the cross-gradient orientation, the automotive service garage and retail fuel outlets are considered PCAs that do not represent an APEC on the Phase I Property. The neighbouring land use within the Phase I Study Area is depicted on Drawing PE6304-2 – Surrounding Land Use Plan, in the Figures section of this report.

Potentially Contaminating Activities (PCAs) and Areas of Potential Environmental Concern (APECs)

Two on-site potentially contaminating activities (PCAs), resulting in areas of potential environmental concern (APECs), were identified on the Phase I Property. The PCAs, APECs and associated CPCs are summarized in Table 1.

Table 1 - Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern with respect to Phase I Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 1 Public Roadway	North and west portions of the Phase I Property	*"Item N/A: Public Roadway"*	On-Site	PHCs (F_1-F_4) BTEX Metals PAH	Soil Groundwater
APEC 2[1] Application of Road Salt	Within existing roadways and former parking lot on Phase I Property	*"Item N/A: Application of Road Salt for De-Icing Purposes During Snow and Ice Conditions"*	On-Site	EC SAR	Soil

1 – In accordance with Section 49.1 of O.Reg. 153/04 standards are deemed to be met if an applicable site condition standard is exceeded at a property solely because the qualified person has determined that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. The exemption outlined in Section 49.1 is being relied up with respect to the Phase I Property.

Five other off-site PCAs were identified within the Phase I Study Area but were deemed not to be of any environmental concern to the Phase I Property based on the separation distance and inferred cross/down-gradient orientation with respect to the known groundwater flow to the north.

All APECs are outlined on Drawing PE6304-1 – Site Plan, while PCAs identified within the Phase I Study Area are present on Drawing PE6304-2 – Surrounding Land Use Plan in the Figures section of this report.

Contaminants of Potential Concern

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

- ❒ Petroleum Hydrocarbons, fractions 1 – 4 (PHCs F_1-F_4);
- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);
- ❒ Metals (including arsenic (As), antimony (Sb), selenium (Se), hexavalent chromium (CrVI) and mercury (Hg));
- ❒ Electrical Conductivity (EC); and
- ❒ Sodium Adsorption Ratio (SAR).

These CPCs have the potential to be present in the soil matrix and groundwater situated beneath the Phase I Property, with the exception of EC and SAR, which are considered to be situated in the soil matrix only.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I ESA is considered to be sufficient to conclude that there are PCAs resulting in APECs associated with the Phase I Property. Additional off-site PCAs identified within the Phase I Study Area are not considered to represent APECs on the Phase I Property based on their separation distance and/or cross-gradient orientation with respect to the Phase I Property.

The identified APECs were 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 Sampling and Analysis Plan

The Sampling and Analysis Plan for this project is included in Appendix 1 of this report. No deviations from the sampling and analysis plan were identified during the Phase II ESA.

3.5 Impediments

No physical impediments, aside from the utilities were encountered during the Phase II ESA program.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation was conducted during the interim of November 7, 2023 through November 8, 2023 in conjunction with a Geotechnical Investigation. The field program consisted of drilling six boreholes and two hand-dug test pits across the Phase II Property.

The boreholes were drilled to a maximum depth of 9.20 m below ground surface (mbgs) and two (BH2-23 and BH6-23) were completed as groundwater monitoring wells to access the groundwater table.

Boreholes BH1-23, BH2-23, BH4-23, BH6-23, HTP1 and HTP2 were placed to address the aforementioned APECs as listed in Table 1 and the remaining boreholes were placed for geotechnical purposes.

The boreholes were drilled with a low clearance drill rig operated by George Downing Estate Drilling of Hawkesbury, Ontario, under full-time supervision of Paterson personnel. The borehole locations are indicated on the attached Drawing PE6304-3 - Test Hole Location Plan.

4.2 Soil Sampling

A total of 33 soil samples were obtained from the boreholes by means of grab sampling from auger flights/auger samples and split spoon sampling. Split spoon samples were taken at approximate 0.76 m intervals. Rock core samples were collected with the use of coring equipment.

The depths at which auger and split spoon samples were obtained from the boreholes are shown as “**AU**”, and “**SS**” respectively on the Soil Profile and Test Data Sheets.

The borehole profiles generally consist of thin layer of topsoil (0.00-0.23 mbgs), followed by fill material (ranging from 0.10-4.90 mbgs) consisting of brown silty sand with varying amounts of clay, gravel and crushed stone and occasional shale fragments, followed by glacial till (ranging from 1.45-4.98 mbgs) consisting of brown silty sand with gravel, shale fragments, occasional cobbles boulders and trace amounts of clay. Shale bedrock was encountered at depths ranging from 3.76-4.98 mbgs.

A layer of fill material consisting of brown silty clay with sand, gravel, some shale fragments and occasional cobbles and boulders was encountered in BH5-23 from 0.69-3.73 mbgs.

Borehole locations are shown on Drawing PE6304-3 – Test Hole Location Plan.

4.3 Field Screening Measurements

Soil samples recovered at the time of sampling 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. Allowing the samples to stabilize to room temperature ensures consistency of readings between samples.

To measure the soil vapours, the analyser probe is inserted into the nominal headspace above the soil sample. A photo ionization detector (PID) was used to measure the volatile organic vapour concentrations. The sample is agitated/manipulated gently as the measurement is taken. The peak reading registered within the first 15 seconds is recorded as the vapour measurement.

The maximum vapour reading measured was 12.5 ppm in the soil samples obtained. These results were not considered to be indicative of potential significant contamination from volatile contaminants. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

No visual or olfactory indications of potential contamination were identified in the soil samples.

4.4 Groundwater Monitoring Well Installation

Two groundwater monitoring wells were installed on the Phase II Property as part of the subsurface investigation. The monitoring wells consisted of 32 mm diameter Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed in Table 2A and are also presented on the Soil

Profile and Test Data Sheets provided in Appendix 1. Monitoring wells had also been installed during a previous investigation by Pinchin. Pinchin monitoring well construction details are presented below in Table 2B.

Borehole locations and elevations were surveyed geodetically by Paterson personnel.

TABLE 2A - Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH2-23	80.64	9.20	6.15-9.20	3.05-9.20	2.74-3.05	Stick-Up
BH6-23	80.26	9.17	6.12-9.17	2.69-9.17	2.44-2.69	Stick-Up

TABLE 2B – Pinchin Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH2-23	80.64	9.20	6.15-9.20	3.05-9.20	2.74-3.05	Stick-Up
BH6-23	80.26	9.17	6.12-9.17	2.69-9.17	2.44-2.69	Stick-Up
BH-4	80.60	6.10	3.05-6.10	2.75-6.10	1.10-2.75	Stick-Up
BH-5	80.33	11.43	8.38-11.43	8.08-11.43	1.20-8.08	Stick-Up

4.5 Groundwater Sampling

Groundwater sampling was conducted on November 15, 2023. 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. Groundwater samples were obtained from each monitoring well, using dedicated sampling equipment. Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation. Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.6 Analytical Testing

Based on the guidelines outlined in the Sampling and Analysis Plan appended to this report, the following soil and groundwater samples, as well as analyzed parameters are presented in Tables 3 and 4.

Table 3 - Testing Parameters for Submitted Soil Samples

Sample ID	Sample Depth & Stratigraphic Unit	Parameters Analyzed							Rationale
		Metals[1]	BTEX	PHCs F_1-F_4	PAHs	EC	SAR	pH	
November 7, 2023									
BH1-23-SS3	1.52 – 2.13 m Silty Sand (Glacial Till)	X	X	X		X	X		Assess potential soil impacts resulting from the existing on-site public roadway and the application of road salt (southeast portion of Phase II Property)
BH2-23-SS4	2.29 – 2.90 m Silty Sand (Glacial Till)	X	X	X	X	X	X	X	Assess potential soil impacts resulting from the existing on-site public roadway and the application of road salt diesel (south-central portion of Phase II Property)
November 8, 2023									
HTP1-G1	0.00 – 0.30 m Silty Sand (Fill Material)	X	X	X	X	X	X		Hand-dug test pit due to the presence of buried utilities. Assess potential soil impacts resulting from the existing on-site public roadway and the application of road salt (southeast portion of Phase II Property)
HTP2-G1	0.00 – 0.30 m (Fill Material)	X	X	X		X			Hand-dug test pit due to the presence of buried utilities. Assess potential soil impacts resulting from the existing on-site public roadway and the application of road salt (west-central portion of Phase II Property)
BH4-23-SS4	2.29 – 2.90 m Silty Sand (Glacial Till)	X	X	X		X	X		Assess potential soil impacts resulting from the existing on-site public roadway and the application of road salt (north-central portion of Phase II Property)
DUP (BH4-23-SS4)	2.29 – 2.90 m Silty Sand (Glacial Till)	X	X	X	X	X	X	X	Duplicate soil sample (BH4-23-SS4) for QA/QC purposes
November 9, 2023									
BH6-23-SS2	0.76 – 1.37 m Silty Sand (Fill Material)	X	X	X		X	X		Assess potential soil impacts resulting from the existing on-site public roadway and the application of road salt (north portion of Phase II Property)

Notes:
1 – including As, Sb, Se, CrVI and Hg

TABLE 4 - Testing Parameters for Submitted Groundwater Samples

Sample ID	Screened Interval	Parameters Analyzed				Rationale
		Metals[1]	BTEX	PHCs F_1-F_4	PAHs	
November 15, 2023						
BH2-23-GW1	3.66 – 6.71 m Glacial Till to Shale Bedrock	X	X	X		Assess potential groundwater impacts resulting from the existing on-site public roadway (south-central portion of Phase II Property)
BH6-23-GW1	2.69 – 5.74 m Glacial Till to Shale Bedrock	X	X	X	X	Assess potential groundwater impacts resulting from the existing on-site public roadway (north portion of Phase II Property)
BH4-GW	3.05 – 6.10 m Glacial Till to Shale Bedrock	X	X	X		Assess potential groundwater impacts resulting from the existing on-site public roadway (south-central portion of Phase II Property)
DUP-Nov15 (BH2-23-GW1)	3.66 – 6.71 m Glacial Till to Shale Bedrock		X	X		Duplicate groundwater sample (BH1-23-GW1) for QA/QC purposes

Notes:
- 1 – including As, Sb, Se, CrVI and Hg

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

4.7 Residue Management

All soil cuttings, purge water and fluids from equipment cleaning were retained on-site.

4.8 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.

4.9 Quality Assurance and Quality Control Measures

A summary of quality assurance and quality control (QA/QC) measures, including sampling containers, preservation, labelling, handling, and custody, equipment cleaning procedures, and field quality control measurements is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

The borehole profiles generally consist of thin layer of topsoil (0.00-0.23 mbgs), followed by fill material (ranging from 0.10-4.90 mbgs) consisting of brown silty sand with varying amounts of clay, gravel and crushed stone and occasional shale fragments, followed by glacial till (ranging from 1.45-4.98 mbgs) consisting of brown silty sand with gravel, shale fragments, occasional cobbles boulders and trace amounts of clay. Shale bedrock was encountered at depths ranging from 3.76-4.98 mbgs.

A layer of fill material consisting of brown silty clay with sand, gravel, some shale fragments and occasional cobbles and boulders was encountered in BH5-23 from 0.69-3.73 mbgs.

Based on our observations, the fill material (brown silty sand) encountered in the boreholes appears to consist of reworked native material.

Groundwater was encountered within the overburden in BH2-23 and BH6-23 at depths of 3.55 and 2.66 mbgs, respectively. Groundwater was encountered within the bedrock in BH4 and BH5 (installed as part of the Pinchin 2022 Phase II ESA) at depths of 4.40 and 2.53 mbgs, respectively.

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

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling event on November 15, 2023 using an electronic water level meter. Groundwater levels were recorded from the monitoring wells installed in BH2-23, BH6-23, BH4 (Pinchin) and BH5 (Pinchin). Groundwater levels are summarized 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**
BH2-23	80.64	3.55	77.09	November 15, 2023
BH6-23	80.27	2.60	77.67	November 15, 2023
BH4	80.60	4.40	75.64	November 15, 2023
BH5	80.33	2.53	77.78	November 15, 2023

Based on the groundwater elevations measured during the sampling events, groundwater contour mapping was completed. Groundwater contours are shown on Drawing PE6304-3 – Test Hole Location Plan. Based on the contour mapping, groundwater flow at the subject site is in a southeasterly direction. It should be noted that groundwater levels are expected to fluctuate throughout the year with seasonal variations.

A horizontal hydraulic gradient of approximately 0.022 m/m was calculated.

5.3 Fine-Coarse Soil Texture

Grain size analysis was not completed as part of this investigation. Coarse grained soil standards were chosen based on the nature of the recovered soil samples.

5.4 Soil: Field Screening

Field screening of the soil samples collected during drilling resulted in vapour readings ranging from 0.6 to 12.5 ppm. No obvious visual or olfactory indications of potential environmental concerns were identified in the soil samples. The 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

Based on the findings of the field screening in combination with sample depth and location, seven soil samples (including one duplicate) were submitted for analysis of metals (including As, Sb, Se, Hg and Cr_{VI}), BTEX, PHCs, PAHs, EC, SAR and/or pH. The results of the analytical testing are presented in Tables 6 to 9. The laboratory Certificates of Analysis are provided in Appendix 1.

TABLE 6 - Analytical Test Results – Soil
Metals

Parameter	MDL (µg/g)	Soil Samples (µg/g)				MECP Table 3 Residential Standards (µg/g)
		Nov 7, 2023		Nov 8, 2023		
		BH1-23-SS3	BH2-23-SS4	HTP1-G1	HTP2-G1	
Antimony	1.0	nd	nd	nd	nd	7.5
Arsenic	1.0	5.9	5.7	3.0	1.4	18
Barium	1.0	86.7	57.4	54.4	53.7	390
Beryllium	0.5	0.7	0.5	nd	nd	4
Boron	5.0	6.9	6.2	nd	6.3	120
Cadmium	0.5	nd	nd	nd	nd	1.2
Chromium (VI)	0.2	nd	nd	nd	nd	8
Chromium	5.0	21.6	17.0	16.3	9.5	160
Cobalt	1.0	9.7	11.1	4.2	2.0	22
Copper	5.0	32.9	29.4	9.7	nd	140
Lead	1.0	10.8	9.2	7.5	6.4	120
Mercury	0.1	nd	nd	nd	nd	0.27
Molybdenum	1.0	1.0	nd	1.3	nd	6.9
Nickel	5.0	24.1	20.0	8.7	nd	100
Selenium	1.0	nd	nd	nd	nd	2.4
Silver	0.3	nd	nd	nd	nd	20
Thallium	1.0	nd	nd	nd	nd	1
Uranium	1.0	nd	nd	1.4	nd	23
Vanadium	10.0	30.4	25.7	26.2	nd	86
Zinc	20.0	58.3	50.8	37.9	20.3	340

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

TABLE 6 continued - Analytical Test Results – Soil
Metals

Parameter	MDL (µg/g)	Soil Samples (µg/g)			MECP Table 3 Residential Standards (µg/g)
		Nov 8, 2023		Nov 9, 2023	
		BH4-23-SS4	DUP (BH4-23-SS4)	BH6-23-SS2	
Antimony	1.0	nd	nd	nd	7.5
Arsenic	1.0	5.5	6.1	6.1	18
Barium	1.0	137	83.5	147	390
Beryllium	0.5	1.3	0.8	1.3	4
Boron	5.0	9.1	7.5	7.2	120
Cadmium	0.5	nd	nd	0.7	1.2
Chromium (VI)	0.2	nd	nd	nd	8
Chromium	5.0	38.0	25.6	35.4	160
Cobalt	1.0	16.1	14.6	13.9	22
Copper	5.0	54.8	34.4	52.0	140
Lead	1.0	18.1	19.6	18.7	120
Mercury	0.1	nd	nd	0.1	0.27
Molybdenum	1.0	1.6	1.4	1.5	6.9
Nickel	5.0	43.5	31.7	39.5	100
Selenium	1.0	nd	nd	nd	2.4
Silver	0.3	nd	nd	nd	20
Thallium	1.0	nd	nd	nd	1
Uranium	1.0	2.0	nd	2.7	23
Vanadium	10.0	45.3	33.6	42.6	86
Zinc	20.0	104	60.9	101	340

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

All detected metal concentrations in the soil samples analysed comply with the selected MECP Table 3 Residential Standards. The analytical results for metals tested in soil are shown on Drawing PE6304-4 – Analytical Testing Plan – Soil.

TABLE 7 - Analytical Test Results – Soil
BTEX and PHCs (F_1 – F_4)

Parameter	MDL (µg/g)	Soil Samples (µg/g)				MECP Table 3 Residential Standards (µg/g)
		Nov 7, 2023		Nov 8, 2023		
		BH1-23-SS3	BH2-23-SS4	HTP1-G1	HTP2-G1	
Benzene	0.02	nd	nd	nd	nd	0.21
Ethylbenzene	0.05	nd	nd	nd	nd	2
Toluene	0.05	nd	nd	nd	nd	2.3
Xylenes, total	0.05	nd	nd	nd	nd	3.1
F1 PHC (C6-C10)	7	nd	nd	nd	nd	55
F2 PHC (C10-C16)	4	nd	nd	nd	nd	98
F3 PHC (C16-C34)	8	19	nd	nd	nd	300
F4 PHC (C34-C50)	6	nd	nd	nd	nd	2,800

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

TABLE 7 continued - Analytical Test Results – Soil
BTEX and PHCs (F_1 – F_4)

Parameter	MDL (µg/g)	Soil Samples (µg/g)			MECP Table 3 Residential Standards (µg/g)
		Nov 8, 2023		Nov 9, 2023	
		BH4-23-SS4	DUP (BH4-23-SS4)	BH6-23-SS2	
Benzene	0.02	nd	nd	nd	0.21
Ethylbenzene	0.05	nd	nd	nd	2
Toluene	0.05	nd	nd	nd	2.3
Xylenes, total	0.05	nd	nd	nd	3.1
F1 PHC (C6-C10)	7	nd	nd	nd	55
F2 PHC (C10-C16)	4	nd	nd	16	98
F3 PHC (C16-C34)	8	nd	nd	22	300
F4 PHC (C34-C50)	6	nd	nd	nd	2,800

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

No BTEX parameter concentrations were detected in the soil samples analysed and all PHC parameters concentrations in the soil samples analysed comply with the selected MECP Table 3 Standards. Therefore the results comply with the selected MECP Table 3 Residential Standards. The analytical results for BTEX and PHCs tested in soil are shown on Drawing PE6304-4 – Analytical Testing Plan – Soil.

TABLE 8 - Analytical Test Results – Soil
PAHs

Parameter	MDL (µg/g)	Soil Samples (µg/g)			MECP Table 3 Residential Standards (µg/g)
		Nov 7, 2023	Nov 8, 2023	Nov 9, 2023	
		BH2-23-SS4	HTP1-G1	BH6-23-SS2	
Acenaphthene	0.02	nd	nd	nd	7.9
Acenaphthylene	0.02	nd	nd	nd	0.15
Anthracene	0.02	nd	nd	nd	0.67
Benzo[a]anthracene	0.02	nd	nd	nd	0.5
Benzo[a]pyrene	0.02	nd	nd	nd	0.3
Benzo[b]fluoranthene	0.02	nd	nd	nd	0.78
Benzo[g,h,i]perylene	0.02	nd	nd	nd	6.6
Benzo[k]fluoranthene	0.02	nd	nd	nd	0.78
Chrysene	0.02	nd	nd	nd	7
Dibenzo[a,h]anthracene	0.02	nd	nd	nd	0.1
Fluoranthene	0.02	nd	nd	nd	0.69
Fluorene	0.02	nd	nd	nd	62
Indeno[1,2,3-cd]pyrene	0.02	nd	nd	nd	0.38
1-Methylnaphthalene	0.02	nd	nd	nd	0.99
2-Methylnaphthalene	0.02	nd	nd	nd	0.99
Methylnaphthalene (1&2)	0.04	nd	nd	nd	0.99
Naphthalene	0.01	nd	nd	nd	0.6
Phenanthrene	0.02	nd	nd	nd	6.2
Pyrene	0.02	nd	nd	nd	78

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

No PAH parameter concentrations were detected in the soil samples analysed and therefore the results comply with the selected MECP Table 3 Residential Standards. The analytical results for PAHs tested in soil are shown on Drawing PE6304-4 – Analytical Testing Plan – Soil.

TABLE 9 - Analytical Test Results – Soil
General Inorganics

Parameter	MDL	Soil Samples (µg/g)				MECP Table 3 Residential Standards
		Nov 7, 2023		Nov 8, 2023		
		BH1-23-SS3	BH2-23-SS4	HTP1-G1	HTP2-G1	
pH	0.05	N/A	7.37	N/A	N/A	5.0-9.0[1] 5.0-11.0[2]
Conductivity	5	348	416	171	125	700 uS/cm
Sodium Absorption Ratio	0.01	2.93	4.72	0.81	0.09	5

Notes:
- MDL – Method Detection Limit
- N/A – Not Analyzed
- 1 – range for surface soil (no more than 1.5m beneath surface soil)
- 2 – range for subsurface soil (more than 1.5m beneath surface soil)

TABLE 9- continued - Analytical Test Results – Soil
General Inorganics

Parameter	MDL	Soil Samples (µg/g)			MECP Table 3 Residential Standards
		Nov 8, 2023		Nov 9, 2023	
		BH4-23-SS4	DUP (BH4-23-SS4)	BH6-23-SS2	
pH	0.05	N/A	N/A	7.07	5.0-9.0[1] 5.0-11.0[2]
Conductivity	5	312	379	259	700 uS/cm
Sodium Absorption Ratio	0.01	2.25	2.62	1.77	5

Notes:
- MDL – Method Detection Limit
- N/A – Not Analyzed
- 1 – range for surface soil (no more than 1.5m beneath surface soil)
- 2 – range for subsurface soil (more than 1.5m beneath surface soil)

All soil samples analyzed for pH, EC and/or SAR comply with the MECP Table 3 Residential Standards.

5.6 Groundwater Quality

Four groundwater samples (including one duplicate) from monitoring wells installed in BH2-23, BH6-23 and BH4 (installed as part of the Pinchin 2022 Phase II ESA) were submitted for laboratory analysis of metals (including As, Sb, Se, Hg and Cr_{VI}), BTEX, PHCs and/or PAHs. The groundwater samples were obtained from the screened intervals noted in Table 2.

The results of the analytical testing are presented in Tables 10 to 12. The laboratory Certificates of Analysis are provided in Appendix 1.

TABLE 10 - Analytical Test Results – Groundwater
Metals

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MECP Table 3 Residential Standards (µg/L)
		November 15, 2023			
		BH2-23-GW1	BH6-23-GW1	BH4-GW	
Antimony	0.5	0.8	1.5	nd	20,000
Arsenic	1	2	2	nd	1,900
Barium	1	294	575	57	29,000
Beryllium	0.5	nd	nd	nd	67
Boron	10	108	465	31	45,000
Cadmium	0.1	nd	nd	nd	2.7
Chromium	1	nd	nd	nd	810
Chromium (VI)	10	nd	nd	nd	140
Cobalt	0.5	2.7	0.9	nd	66
Copper	0.5	0.9	nd	5.2	87
Lead	0.1	0.2	nd	nd	25
Mercury	0.1	nd	nd	nd	0.29
Molybdenum	0.5	2.3	4.8	1.0	9,200
Nickel	1	8	2	3	490
Selenium	1	nd	2	nd	63
Silver	0.1	nd	nd	nd	1.5
Sodium	200	420000	337000	525000	2,300,000
Thallium	0.1	nd	nd	nd	510
Uranium	0.1	4.2	4.1	1.3	420
Vanadium	0.5	0.6	0.8	nd	250
Zinc	5	nd	nd	nd	1,100

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

All detected metal concentrations in the groundwater samples analysed comply with the selected MECP Table 3 Residential Standards. The analytical results for metals tested in groundwater are shown on Drawing PE6304-5 – Analytical Testing Plan – Groundwater.

TABLE 11 - Analytical Test Results – Groundwater
BTEX and PHCs (F_1-F_4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)				MECP Table 3 Residential Standards (µg/L)
		November 15, 2023				
		BH2-23-GW1	BH6-23-GW1	BH4-GW	DUP-Nov15 (BH2-23-GW1)	
Benzene	0.5	nd	nd	nd	nd	44
Ethylbenzene	0.5	nd	nd	nd	nd	2,300
Toluene	0.5	nd	nd	nd	nd	18,000
Xylenes, total	0.5	nd	nd	nd	nd	4,200
PHC F_1	25	nd	nd	nd	nd	750
PHC F_2	100	nd	nd	nd	nd	150
PHC F_3	100	nd	nd	nd	nd	500
PHC F_4	100	nd	nd	nd	nd	500

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

No detectable BTEX or PHC concentrations were identified in the groundwater samples analysed, therefore the results comply with the selected MECP Table 3 Residential Standards. The analytical results for groundwater tested are shown on Drawing PE6304-3– Analytical Testing Plan – Groundwater.

TABLE 12 - Analytical Test Results – Groundwater
PAHs

Parameter	MDL (µg/L)	Groundwater Sample (µg/L)	MECP Table 3 Residential Standards (µg/L)
		Nov 15, 2023	
		BH6-23-GW1	
Acenaphthene	0.05	nd	600
Acenaphthylene	0.05	nd	1.8
Anthracene	0.01	nd	2.4
Benzo[a]anthracene	0.01	nd	4.7
Benzo[a]pyrene	0.01	nd	0.81
Benzo[b]fluoranthene	0.05	nd	0.75
Benzo[g,h,i]perylene	0.05	nd	0.2
Benzo[k]fluoranthene	0.05	nd	0.4
Chrysene	0.05	nd	1
Dibenzo[a,h]anthracene	0.05	nd	0.52
Fluoranthene	0.01	nd	130
Fluorene	0.05	nd	400
Indeno [1,2,3-cd] pyrene	0.05	nd	0.2
1-Methylnaphthalene	0.05	nd	1,800
2-Methylnaphthalene	0.05	nd	1,800
Methylnaphthalene (1&2)	0.10	nd	1,800
Naphthalene	0.05	nd	1,400
Phenanthrene	0.05	nd	580
Pyrene	0.01	nd	68

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

No detectable PAH concentrations were identified in the groundwater sample analysed; therefore the results comply with the selected MECP Table 3 Residential Standards. The analytical results for groundwater tested are shown on Drawing PE6304-3– Analytical Testing Plan – Groundwater.

5.7 Quality Assurance and Quality Control Results

All samples submitted as part of the November 2023 sampling events were handled in accordance with the Analytical Protocol with respect to preservation method, storage requirement, and container type. As per Subsection 47(3) of O.Reg. 153/04, as amended, under the Environmental Protection Act, a Certificate of Analysis has been received for each sample submitted for analysis and all Certificates of Analysis are appended to this report.

Duplicate soil and groundwater samples from BH4-23-SS4 and BH2-23-GW1 were submitted for laboratory analysis of metals, BTEX, PHCs (F1-F4), EC and/or SAR. The duplicates were collected with the intent of calculating the relative percent difference (RPD) between duplicate sample values, as a way of assessing the quality of the analytical test results.

The RPD calculations for the original soil and duplicate sample are provided in Table 13.

Table 13 - QA/QC Calculations – Soil

Parameter	MDL (µg/g)	BH4-23-SS4	DUP1 (BH4-23-SS4)	RPD (%)	QA/QC Result
Arsenic	1.0	5.5	6.1	10.3	Meets Target
Barium	1.0	137	147	7.0	Meets Target
Beryllium	0.5	1.3	1.3	0.0	Meets Target
Boron	5.0	9.1	7.2	23.3	Does Not Meet Target
Chromium	5.0	38.0	35.4	7.1	Meets Target
Cobalt	1.0	16.1	13.9	14.7	Meets Target
Copper	5.0	54.8	52.0	5.2	Meets Target
Lead	1.0	18.1	18.7	3.3	Meets Target
Molybdenum	1.0	1.6	1.5	6.5	Meets Target
Nickel	5.0	43.5	39.5	9.6	Meets Target
Uranium	1.0	2.0	2.7	29.8	Does Not Meet Target
Vanadium	10.0	45.3	42.6	6.1	Meets Target
Zinc	20.0	104	101	2.9	Meets Target
Conductivity	5	312	379	19.4	Meets Target
SAR	0.01	2.25	2.62	15.2	Meets Target

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

Typically, RPD values below 20% are considered to be of satisfactory quality. The relative percent difference (RPD) results calculated for two soil parameters (boron and uranium) fell outside of the acceptable range of 20%, and thus do not meet the data quality objectives outlined in the Sampling and Analysis Plan, appended to this report.

Despite the exceeded RPD values calculated for sample BH4-23-SS4 between the original and duplicate samples, it should be noted that the concentrations of the parameters were well within the selected MECP Table 3 Residential Standards in both samples by a large margin. As a result, it is our opinion that the decision-making usefulness of the samples is not considered to be impaired, and thus the quality of the field data collected during this remediation is considered to be sufficient to meet the overall objectives of this assessment.

All parameters measured in both the original and duplicate samples for groundwater sample BH7-23-GW1 were identified as being non-detect. Based on the non-detect concentrations in both the original and duplicate samples, the results are considered to be acceptable.

The quality of the field data collected during the Phase II ESA is considered to be sufficient to meet the overall objectives of the assessment.

5.8 Phase II Conceptual Site Model

The following section has been prepared in accordance with the requirements of O.Reg. 153/04, as 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

Based on the results of the Phase I ESA completed for the subject property, two on-site PCAs were identified, both of which represent APECs on the Phase II Property. The APECs on the Phase II Property are as follows:

- APEC 1: Resulting from the presence of an existing public roadway through the north and west portions of the Phase II Property (PCA #N/A);

- APEC 2: Resulting from the application of road salt for de-icing purposes during snow and ice conditions throughout the on-site roadway (PCA #N/A).

A total of five off-site existing PCAs were identified within the Phase I Study Area. The off-site PCAs identified are not considered to result in APECs on the Phase II Property. Due to their respective separation distances and/or cross/down gradient orientations with respect to the Phase II Property.

Contaminants of Potential Concern

The following CPCs are identified with respect to the Phase II Property:

- Petroleum Hydrocarbons, fractions 1 – 4 (PHCs F_1-F_4);
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Metals (including arsenic (As), antimony (Sb), selenium (Se), hexavalent chromium (CrVI) and mercury (Hg));
- Electrical Conductivity (EC); and
- Sodium Adsorption Ratio (SAR).

These CPCs have the potential to be present in the soil matrix and groundwater situated beneath the Phase II Property, with the exception of EC and SAR, which are considered to be situated in the soil matrix only.

Subsurface Structures and Utilities

Multiple underground utilities were identified on the Phase II Property, including fiber optic, hydro, natural gas, water and sewer services. An irrigation system was also identified across the Phase II Property.

Two City of Ottawa utility boxes were identified on the north portion of the Phase II Property. Additionally, an underground irrigation (sprinkler system) access panel was identified on the west portion of the Phase II Property.

No other subsurface structures were identified on the Phase II Property.

Physical Setting

Site Stratigraphy

The stratigraphy of the Phase II Property generally consists of:

- ❒ Topsoil; encountered at depths ranging from approximately 0.00 to 0.23 m below ground surface.
- ❒ Fill material consisting of brown silty sand with varying amounts of clay, gravel and crushed stone and occasional shale fragments; encountered at depths ranging from approximately 0.10 to 4.90 m below ground surface.
- ❒ A layer of fill material consisting of brown silty clay with sand, gravel, some shale fragments and occasional cobbles and boulders was encountered in BH5-23 from 0.69-3.73 mbgs.
- ❒ Glacial till consisting of brown silty sand with gravel, shale fragments, occasional cobbles boulders and trace amounts of clay; encountered at depths ranging from approximately 1.45-4.98 m below ground surface.
- ❒ Shale bedrock; encountered at depths ranging from approximately 3.76 to 4.98 mbgs.

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

Groundwater was encountered within the overburden in BH2-23 and BH6-23 at depths of 3.55 and 2.66 mbgs, respectively. Groundwater was encountered within the bedrock in BH4 and BH5 (installed as part of the Pinchin 2022 Phase II ESA) at depths of 4.40 and 2.53 mbgs, respectively.

It should be noted that groundwater levels are expected to fluctuate throughout the year with seasonal variations. Groundwater contours are shown on Drawing PE6304-3 – Test Hole Location Plan.

Approximate Depth to Bedrock

Shale bedrock was encountered at depths ranging from 3.76 to 4.98 m below existing grade across the Phase II Property.

Approximate Depth to Water Table

The depth to the water table at the Phase II Property varies between approximately 2.53 to 4.40 m below existing grade.

Sections 41 and 43.1 of the Regulation

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not within 30m of an environmentally sensitive area.

Section 43.1 of the Regulation does not apply to the subject site as bedrock is not located less than 2 m below ground surface.

Fill Placement

Fill material was identified in each borehole on the Phase II Property, ranging in depth from 0.10 to 4.90 m below ground surface.

Existing Buildings and Structures

No buildings or structures are present on the Phase II Property. Two billboards are present on the north and west portions of the Phase II Property.

Proposed Buildings and Other Structures

It is our understanding that the Phase II Property will be developed with a high-rise residential apartment building with two levels of underground parking. It is expected that the proposed building will be municipally serviced by the City of Ottawa municipal drinking water distribution network.

Areas of Natural Scientific Interest and Water Bodies

No water bodies are present on the Phase I Property. The nearest water body with respect to the Phase I Property is the Ottawa River located approximately 3.2 km to the north.

Environmental Condition

Areas Where Contaminants are Present

Based on the findings of this Phase II ESA, no contaminant concentrations exceeding MECP Table 3 Residential Standards were identified within the soil or groundwater on the Phase II Property.

Types of Contaminants

Based on the findings of this Phase II ESA, no contaminant concentrations exceeding MECP Table 3 Residential Standards were identified within the soil or groundwater on the Phase II Property.

Contaminated Media

Based on the findings of this Phase II ESA, no contaminant concentrations exceeding MECP Table 3 Residential Standards were identified within the soil or groundwater on the Phase II Property.

What Is Known About Areas Where Contaminants Are Present

Based on the findings of this Phase II ESA, no contaminant concentrations exceeding MECP Table 3 Residential Standards were identified within the soil or groundwater on the Phase II Property.

Distribution and Migration of Contaminants

Based on the findings of this Phase II ESA, no contaminant concentrations exceeding MECP Table 3 Residential Standards were identified within the soil or groundwater on the Phase II Property.

Discharge of Contaminants

Based on the findings of this Phase II ESA, no contaminants have been discharged on the Phase II Property.

Climatic and Meteorological Conditions

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

Based on the findings of this Phase II ESA, climatic and meteorological conditions are not considered to have affected contaminant distribution on the Phase II Property.

Potential for Vapour Intrusion

Based on the findings of this Phase II ESA, there is no potential for vapour intrusion on the Phase II Property.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the property addressed 1440 Blair Towers Place, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I ESA and considered to result in areas of potential environmental concern (APECs) on the Phase II Property.

The Phase II ESA subsurface investigation, which was conducted in conjunction with a geotechnical investigation, consisted of drilling six boreholes and two hand-dug test pits across the Phase II Property. Two of the boreholes were constructed with groundwater monitoring wells. The general soil profile encountered during the field program consisted of topsoil (0.00-0.23 mbgs), followed by fill material (ranging from 0.10-4.90 mbgs) consisting of brown silty sand with varying amounts of clay, gravel and crushed stone and occasional shale fragments, followed by glacial till (ranging from 1.45-4.98 mbgs) consisting of brown silty sand with gravel, shale fragments, occasional cobbles boulders and trace amounts of clay. Shale bedrock was encountered at depths ranging from 3.76-4.98 mbgs.

A total of seven soil samples (including one duplicate) were submitted for analysis of metals (including As, Sb, Se, Hg and Cr_{VI}), BTEX, PHCs, PAHs, EC, SAR and/or pH. All parameter concentrations analyzed in the soil samples comply with MECP Table 3 Residential Standards.

Groundwater samples (including one duplicate) from monitoring wells installed in BH2-23, BH6-23 and BH4 (installed as part of the Pinchin 2022 Phase II ESA) were collected during the November 15, 2023 sampling event and submitted for laboratory analysis of metals (including As, Sb, Se, Hg and Cr_{VI}), BTEX, PHCs and/or PAHs. All groundwater results comply with the selected MECP Table 3 Standards.

Based on the findings of this Phase II ESA, no further environmental investigation is required.

Recommendations

Groundwater Monitoring Wells

It is our recommendation that the monitoring wells installed on the Phase II Property should remain viable for future monitoring. If they are not going to be used in the future, or will be entirely removed, they should be abandoned according to Ontario Regulation 903. The 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 under the supervision of a Qualified Person, in general accordance with O. Reg 153/04. 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 subject site 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 Le Groupe Maurice. Notification from Le Groupe Maurice and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Jeremy Camposarcone, B. Eng.

Adrian Menyhart, P.Eng., Q.P.$_{ESA}$

Report Distribution:

- ❒ Le Groupe Maurice
- ❒ Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE6304-1 – SITE PLAN

DRAWING PE6304-2 – SURROUNDING LAND USE PLAN

DRAWING PE6304-3 – TEST HOLE LOCATION PLAN

DRAWING PE6304-4 – ANALYTICAL TESTING PLAN – SOIL

DRAWING PE6304-4A – CROSS SECTION A-A' – SOIL

DRAWING PE6304-4B – CROSS SECTION B-B' – SOIL

DRAWING PE6304-5 – ANALYTICAL TESTING PLAN – GROUNDWATER

DRAWING PE6304-5A – CROSS SECTION A-A' – GROUNDWATER

DRAWING PE6304-5B – CROSS SECTION B-B' – GROUNDWATER

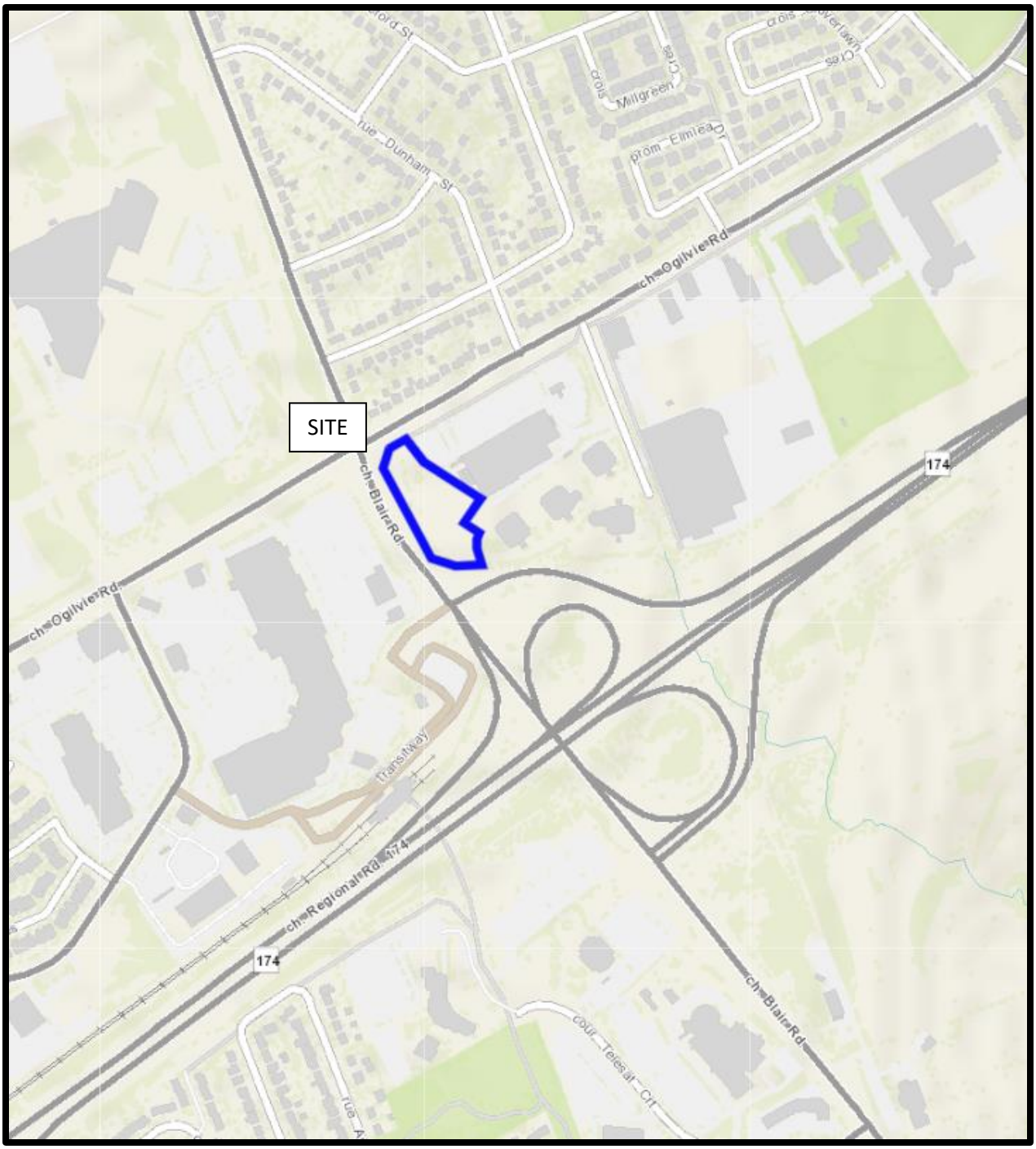
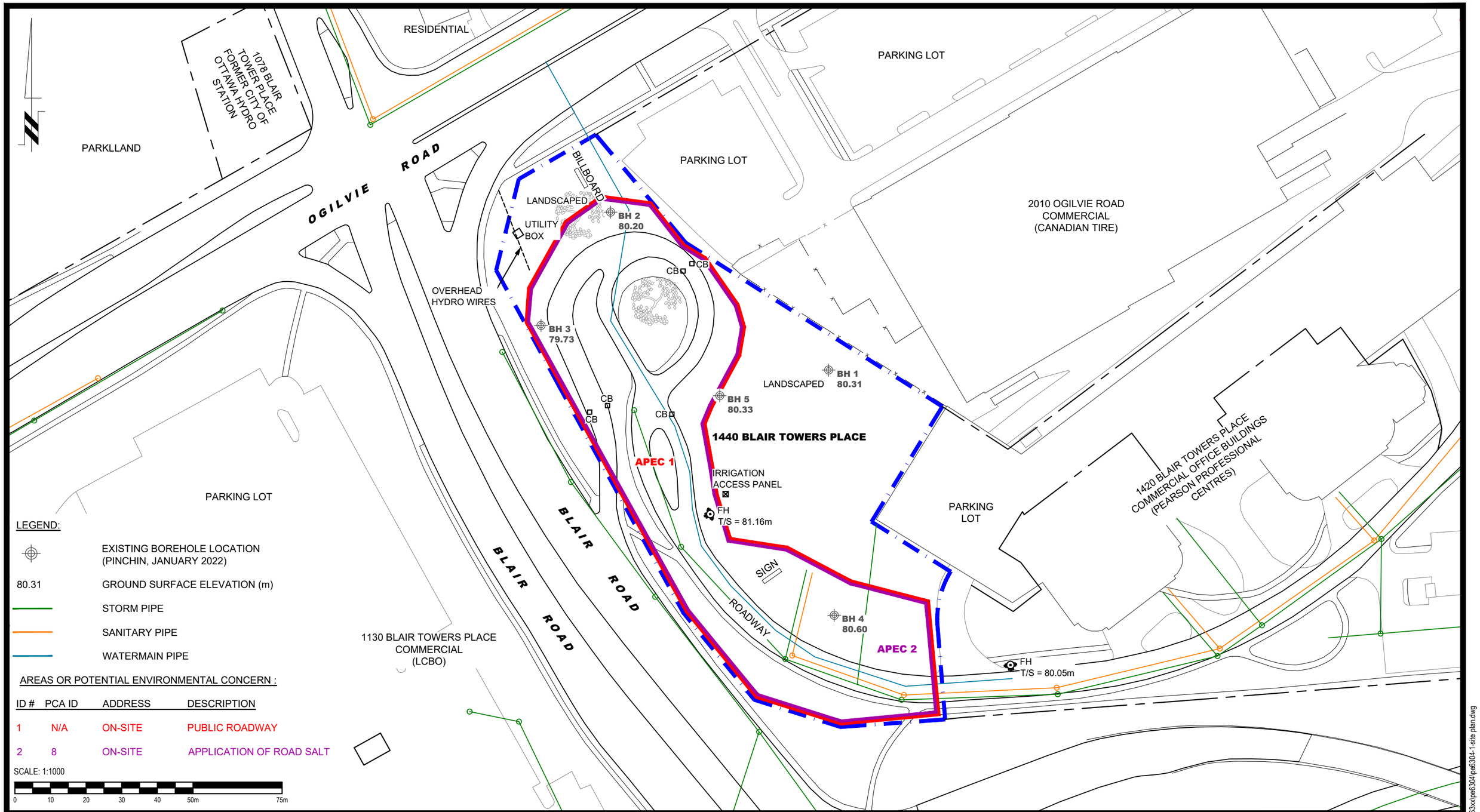


FIGURE 1

KEY PLAN



LEGEND:

⊕	EXISTING BOREHOLE LOCATION (PINCHIN, JANUARY 2022)
80.31	GROUND SURFACE ELEVATION (m)
	STORM PIPE
	SANITARY PIPE
	WATERMAIN PIPE

AREAS OR POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	ADDRESS	DESCRIPTION
1	N/A	ON-SITE	PUBLIC ROADWAY
2	8	ON-SITE	APPLICATION OF ROAD SALT

SCALE: 1:1000

0 10 20 30 40 50m 75m

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

NO.	REVISIONS	DATE	INITIAL

LE GROUPE MAURICE

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:1000	Date: 11/2023
Drawn by: YA	Report No.: PE6304-1
Checked by: JC	Dwg. No.: PE6304-1
Approved by: AM	Revision No.:

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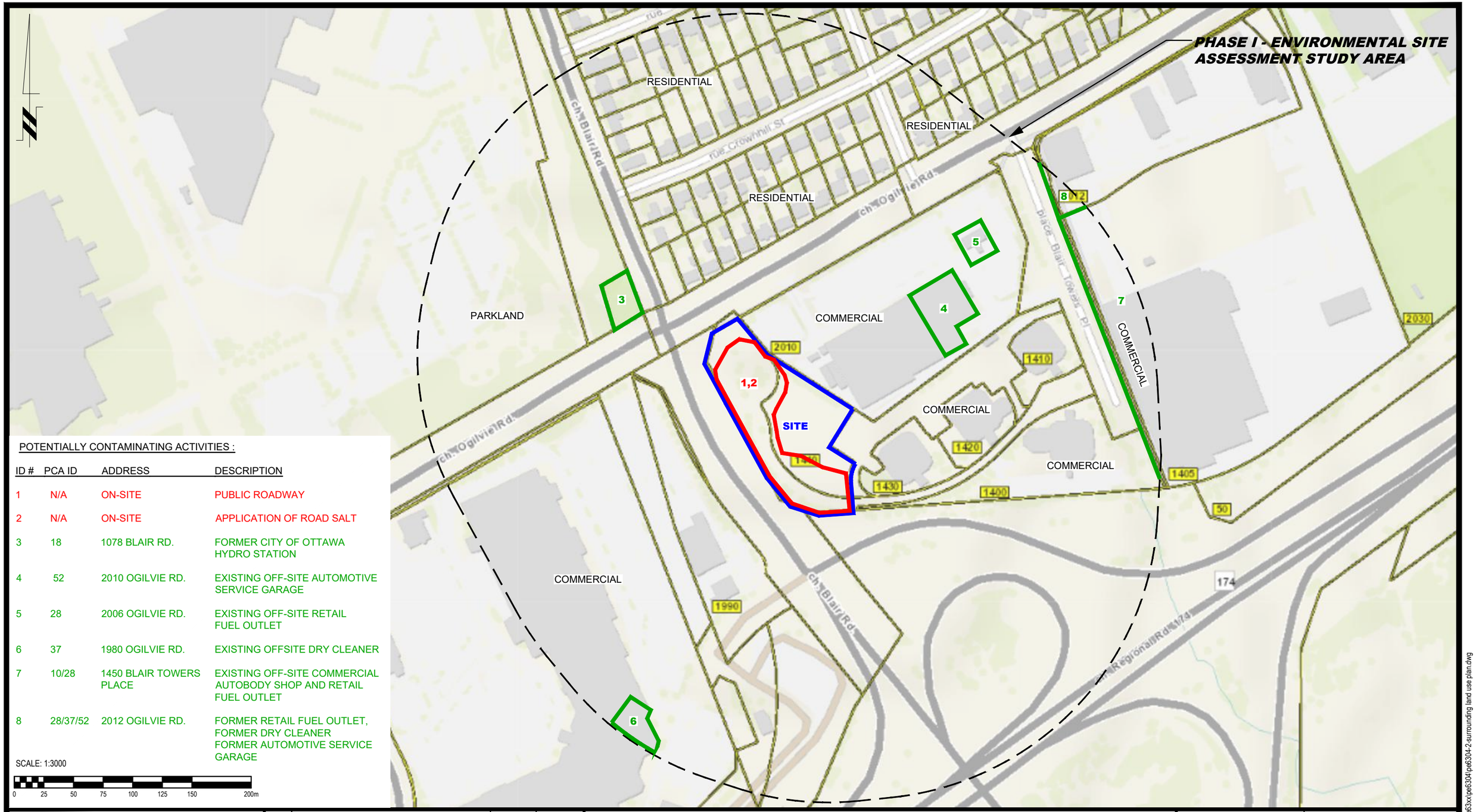

POTENTIALLY CONTAMINATING ACTIVITIES :

ID #	PCA ID	ADDRESS	DESCRIPTION
1	N/A	ON-SITE	PUBLIC ROADWAY
2	N/A	ON-SITE	APPLICATION OF ROAD SALT
3	18	1078 BLAIR RD.	FORMER CITY OF OTTAWA HYDRO STATION
4	52	2010 OGILVIE RD.	EXISTING OFF-SITE AUTOMOTIVE SERVICE GARAGE
5	28	2006 OGILVIE RD.	EXISTING OFF-SITE RETAIL FUEL OUTLET
6	37	1980 OGILVIE RD.	EXISTING OFFSITE DRY CLEANER
7	10/28	1450 BLAIR TOWERS PLACE	EXISTING OFF-SITE COMMERCIAL AUTOBODY SHOP AND RETAIL FUEL OUTLET
8	28/37/52	2012 OGILVIE RD.	FORMER RETAIL FUEL OUTLET, FORMER DRY CLEANER FORMER AUTOMOTIVE SERVICE GARAGE

SCALE: 1:3000

0 25 50 75 100 125 150 200m

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NO.	REVISIONS	DATE	INITIAL

LE GROUPE MAURICE

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:1000	Date: 11/2023
Drawn by: YA	Report No.: PE6304-1
Checked by: JC	Dwg. No.: PE6304-2
Approved by: AM	Revision No.:

11x17

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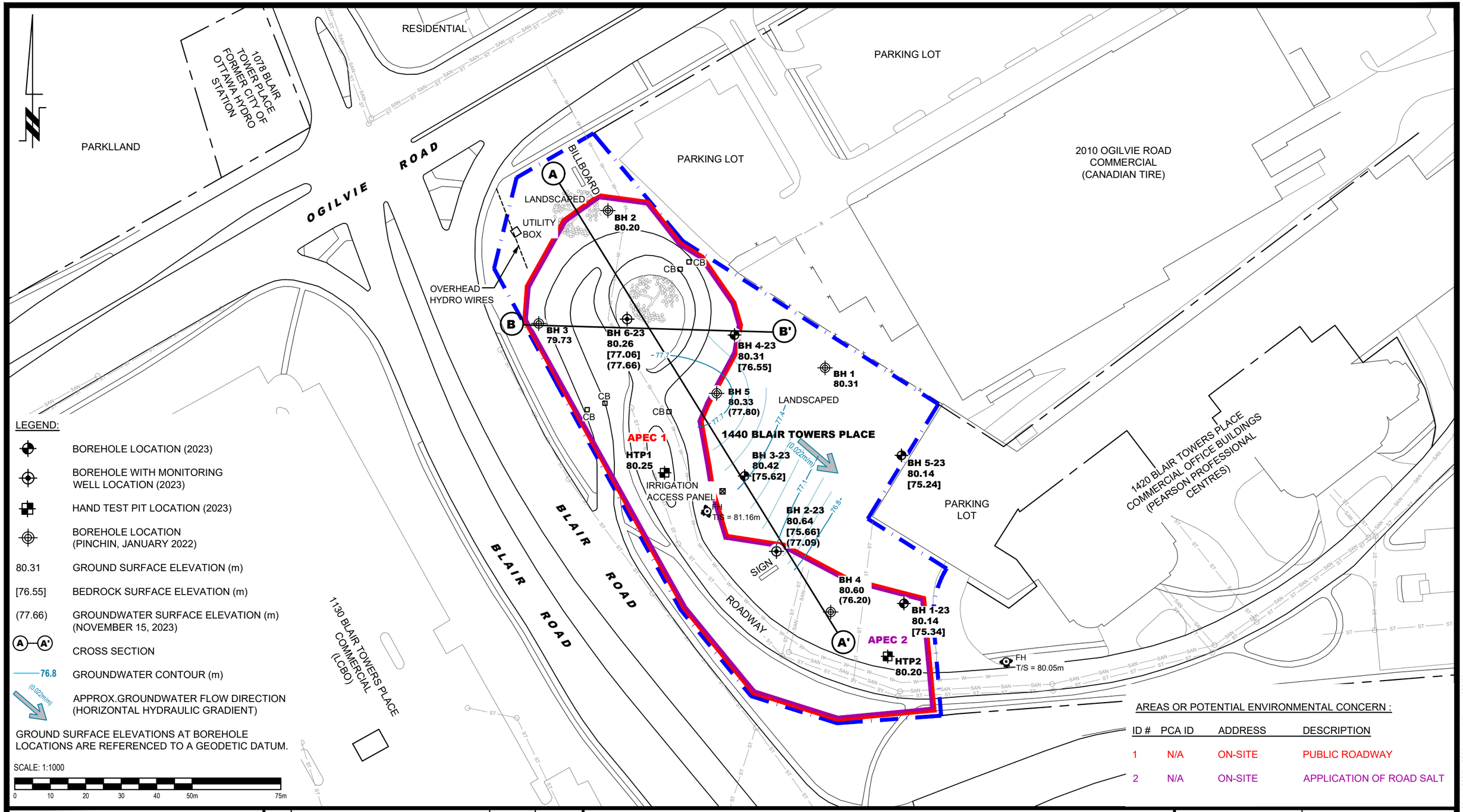

LEGEND:

- BOREHOLE LOCATION (2023)
- BOREHOLE WITH MONITORING WELL LOCATION (2023)
- HAND TEST PIT LOCATION (2023)
- BOREHOLE LOCATION (PINCHIN, JANUARY 2022)
- 80.31 — GROUND SURFACE ELEVATION (m)
- [76.55] — BEDROCK SURFACE ELEVATION (m)
- (77.66) — GROUNDWATER SURFACE ELEVATION (m) (NOVEMBER 15, 2023)
- A — A' — CROSS SECTION
- 76.8 — GROUNDWATER CONTOUR (m)
- (0.022m/m) — APPROX.GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

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

SCALE: 1:1000

0 10 20 30 40 50m 75m

AREAS OR POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	ADDRESS	DESCRIPTION
1	N/A	ON-SITE	PUBLIC ROADWAY
2	N/A	ON-SITE	APPLICATION OF ROAD SALT

PATERSON GROUP
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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1000	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-3
Approved by: AM	Revision No.:

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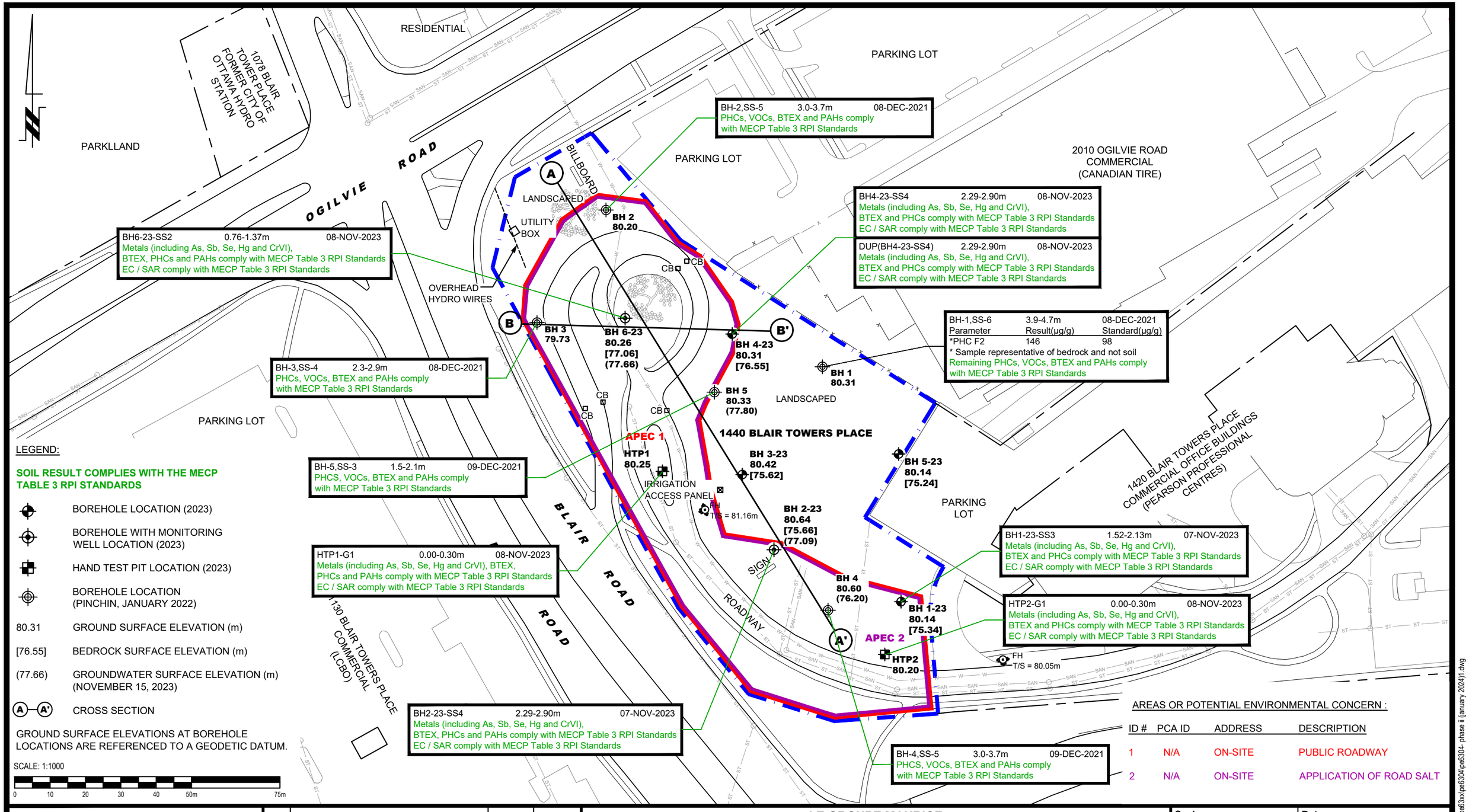

BH-2,SS-5 3.0-3.7m 08-DEC-2021
PHCs, VOCs, BTEX and PAHs comply with MECP Table 3 RPI Standards

BH6-23-SS2 0.76-1.37m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX, PHCs and PAHs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH4-23-SS4 2.29-2.90m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX and PHCs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

DUP(BH4-23-SS4) 2.29-2.90m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX and PHCs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH-1,SS-6 3.9-4.7m 08-DEC-2021

Parameter	Result(µg/g)	Standard(µg/g)
*PHC F2	146	98

* Sample representative of bedrock and not soil
Remaining PHCs, VOCs, BTEX and PAHs comply with MECP Table 3 RPI Standards

BH-3,SS-4 2.3-2.9m 08-DEC-2021
PHCs, VOCs, BTEX and PAHs comply with MECP Table 3 RPI Standards

BH-5,SS-3 1.5-2.1m 09-DEC-2021
PHCS, VOCs, BTEX and PAHs comply with MECP Table 3 RPI Standards

BH1-23-SS3 1.52-2.13m 07-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX and PHCs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

HTP1-G1 0.00-0.30m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX, PHCs and PAHs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

HTP2-G1 0.00-0.30m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX and PHCs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH2-23-SS4 2.29-2.90m 07-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX, PHCs and PAHs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH-4,SS-5 3.0-3.7m 09-DEC-2021
PHCS, VOCs, BTEX and PAHs comply with MECP Table 3 RPI Standards

LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 3 RPI STANDARDS

- BOREHOLE LOCATION (2023)
- BOREHOLE WITH MONITORING WELL LOCATION (2023)
- HAND TEST PIT LOCATION (2023)
- BOREHOLE LOCATION (PINCHIN, JANUARY 2022)
- 80.31 GROUND SURFACE ELEVATION (m)
- [76.55] BEDROCK SURFACE ELEVATION (m)
- (77.66) GROUNDWATER SURFACE ELEVATION (m) (NOVEMBER 15, 2023)
- A—A' CROSS SECTION

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

SCALE: 1:1000

0 10 20 30 40 50m 75m

AREAS OR POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	ADDRESS	DESCRIPTION
1	N/A	ON-SITE	PUBLIC ROADWAY
2	N/A	ON-SITE	APPLICATION OF ROAD SALT

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

NO.	REVISIONS	DATE	INITIAL

LE GROUPE MAURICE

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title: **ANALYTICAL TESTING PLAN - SOIL**

Scale: 1:1000	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-4
Approved by: AM	Revision No.:

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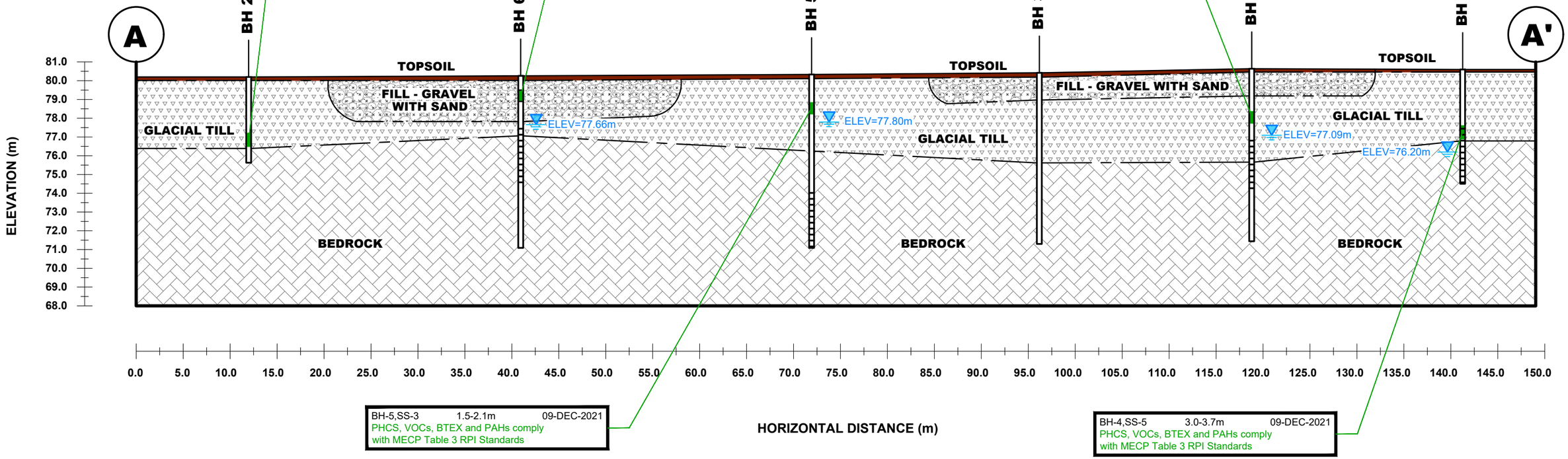
11x17

BH2-23-SS4 2.29-2.90m 07-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI),
BTEX, PHCs and PAHs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH6-23-SS2 0.76-1.37m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI),
BTEX, PHCs and PAHs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH-2,SS-5 3.0-3.7m 08-DEC-2021
PHCs, VOCs, BTEX and PAHs comply
with MECP Table 3 RPI Standards



BH-5,SS-3 1.5-2.1m 09-DEC-2021
PHCS, VOCs, BTEX and PAHs comply
with MECP Table 3 RPI Standards

BH-4,SS-5 3.0-3.7m 09-DEC-2021
PHCS, VOCs, BTEX and PAHs comply
with MECP Table 3 RPI Standards

SOIL RESULT COMPLIES WITH THE MECP TABLE 3 RPI STANDARDS

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LE GROUPE MAURICE

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title: **CROSS SECTION A-A' - SOIL**

Scale: AS SHOWN	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-4A
Approved by: AM	Revision No.:

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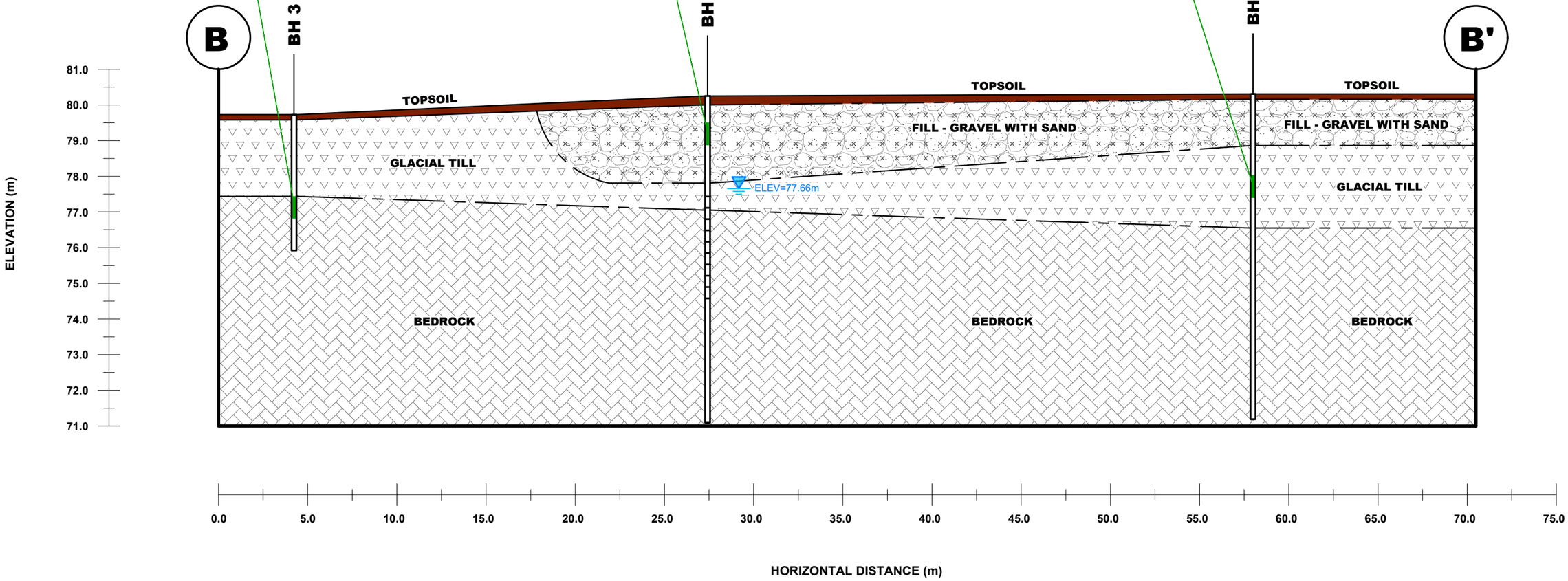
BH-3,SS-4 2.3-2.9m 08-DEC-2021
PHCs, VOCs, BTEX and PAHs comply with MECP Table 3 RPI Standards

BH6-23-SS2 0.76-1.37m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX, PHCs and PAHs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

BH4-23-SS4 2.29-2.90m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX and PHCs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards

DUP(BH4-23-SS4) 2.29-2.90m 08-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI), BTEX and PHCs comply with MECP Table 3 RPI Standards
EC / SAR comply with MECP Table 3 RPI Standards



SOIL RESULT COMPLIES WITH THE MECP TABLE 3 RPI STANDARDS

PATERSON GROUP
9 AURIGA DRIVE
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LE GROUPE MAURICE

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE
OTTAWA, ONTARIO

Title: CROSS SECTION B-B' - SOIL

Scale: AS SHOWN	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-4B
Approved by: AM	Revision No.:

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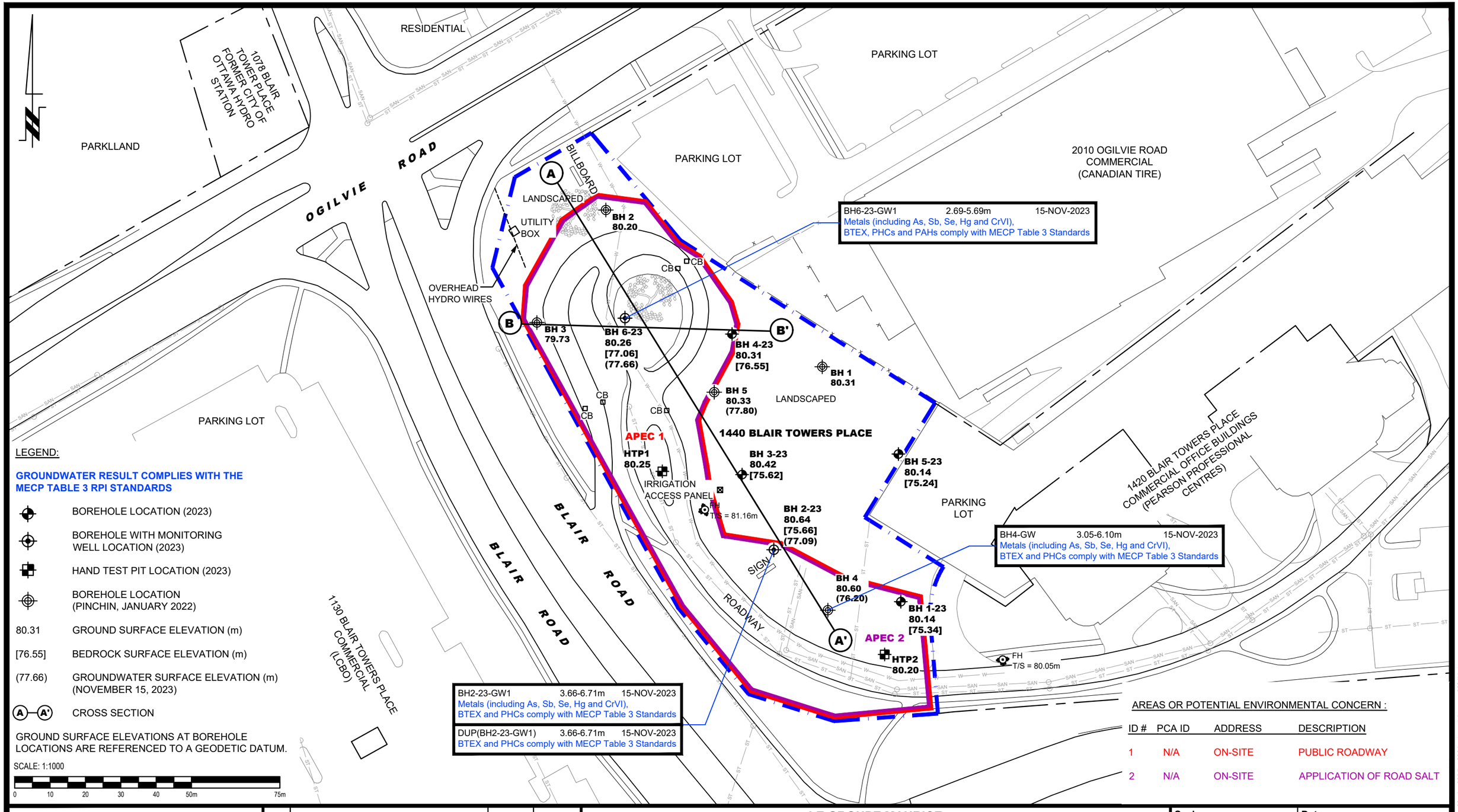

LEGEND:

GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 3 RPI STANDARDS

- BOREHOLE LOCATION (2023)
- BOREHOLE WITH MONITORING WELL LOCATION (2023)
- HAND TEST PIT LOCATION (2023)
- BOREHOLE LOCATION (PINCHIN, JANUARY 2022)
- 80.31 GROUND SURFACE ELEVATION (m)
- [76.55] BEDROCK SURFACE ELEVATION (m)
- (77.66) GROUNDWATER SURFACE ELEVATION (m) (NOVEMBER 15, 2023)
- A—A' CROSS SECTION

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

SCALE: 1:1000

0 10 20 30 40 50m 75m

AREAS OR POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	ADDRESS	DESCRIPTION
1	N/A	ON-SITE	PUBLIC ROADWAY
2	N/A	ON-SITE	APPLICATION OF ROAD SALT

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

NO.	REVISIONS	DATE	INITIAL

LE GROUPE MAURICE

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title: **ANALYTICAL TESTING PLAN - GROUNDWATER**

Scale: 1:1000	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-5
Approved by: AM	Revision No.:

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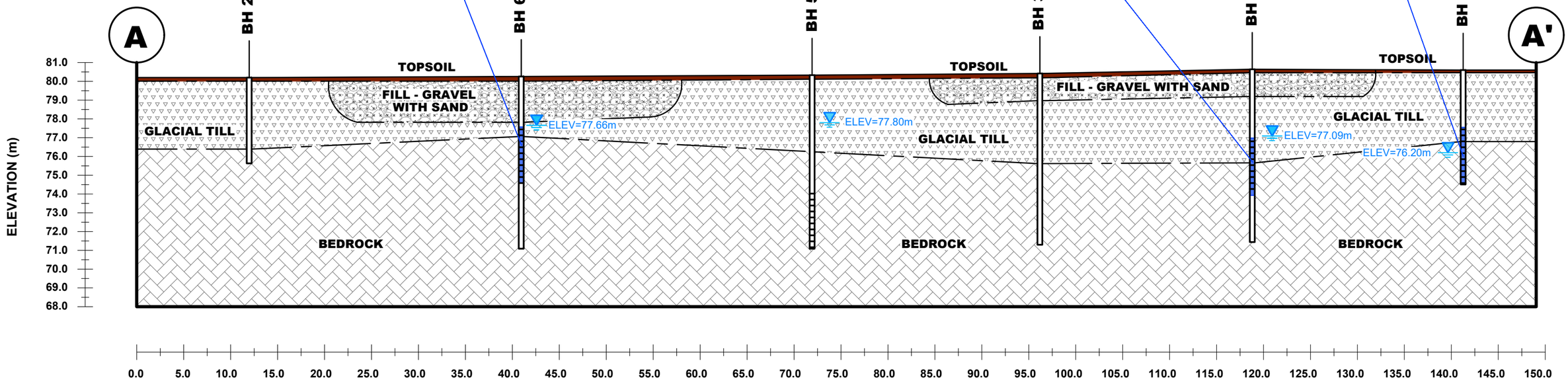
11x17

BH6-23-GW1 2.69-5.69m 15-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI),
BTEX, PHCs and PAHs comply with MECP Table 3 Standards

BH2-23-GW1 3.66-6.71m 15-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI),
BTEX and PHCs comply with MECP Table 3 Standards

DUP(BH2-23-GW1) 3.66-6.71m 15-NOV-2023
BTEX and PHCs comply with MECP Table 3 Standards

BH4-GW 3.05-6.10m 15-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI),
BTEX and PHCs comply with MECP Table 3 Standards



GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 3 RPI STANDARDS

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NO.	REVISIONS	DATE	INITIAL

LE GROUPE MAURICE

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title: CROSS SECTION A-A' - GROUNDWATER

Scale: AS SHOWN	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-5A
Approved by: AM	Revision No.:

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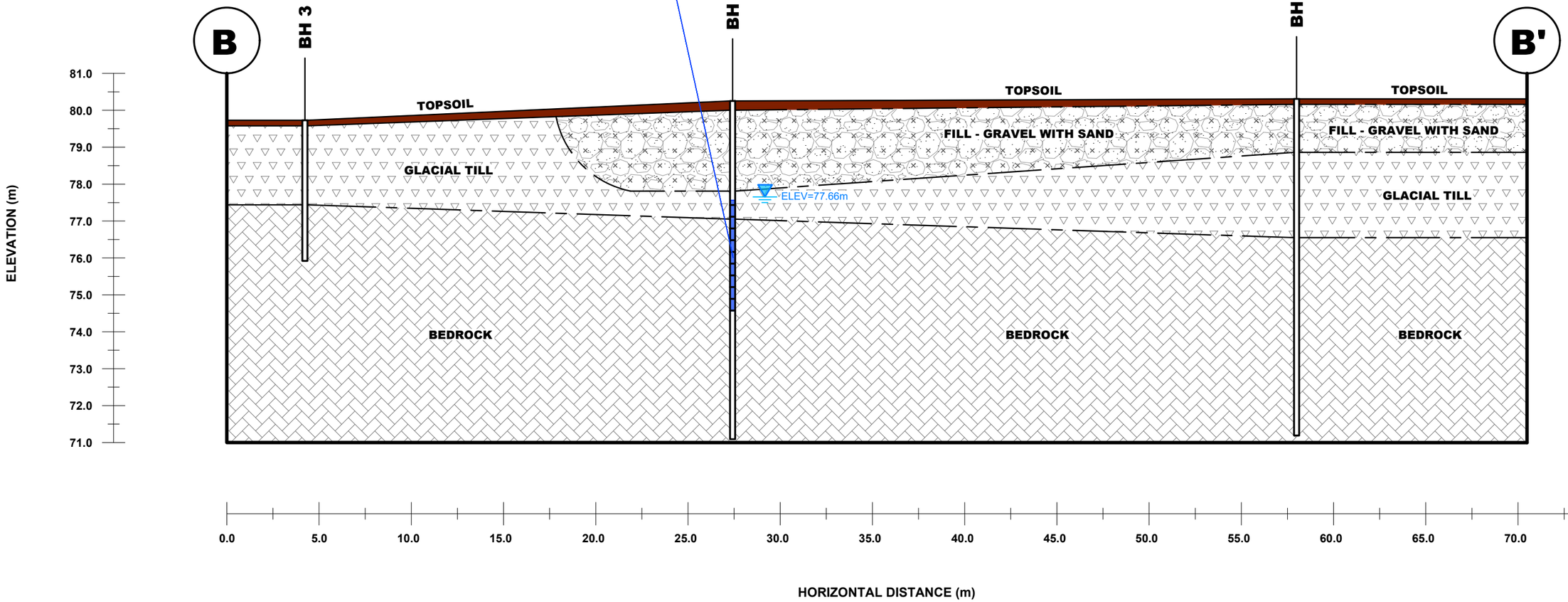
11x17

BH6-23-GW1 2.69-5.69m 15-NOV-2023
Metals (including As, Sb, Se, Hg and CrVI),
BTEX, PHCs and PAHs comply with MECP Table 3 Standards



GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 3 RPI STANDARDS

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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

LE GROUPE MAURICE

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1440 BLAIR TOWER PLACE

OTTAWA, ONTARIO

Title: CROSS SECTION B-B' - GROUNDWATER

Scale: AS SHOWN	Date: 01/2024
Drawn by: YA	Report No.: PE6304-2
Checked by: JC	Dwg. No.: PE6304-5B
Approved by: AM	Revision No.:

11x17

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APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

PATERSON GROUP

Sampling and Analysis Plan

1440 Blair Towers Place

Ottawa, Ontario

Prepared for Le Groupe Maurice

Report: PE6304-SAP
Date: November 1, 2023

TABLE OF CONTENTS

1.0 SAMPLING PROGRAM 1
2.0 ANALYTICAL TESTING PROGRAM 2
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1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Le Groupe Maurice, to conduct a Phase II – Environmental Site Assessment (Phase II ESA) at 1440 Blair Towers Place, in the City of Ottawa, Ontario.

Based on the findings of the Phase I ESA, the following subsurface investigation program was developed. The Phase II ESA was carried out in conjunction with a geotechnical investigation.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1-23	Placed on the southeast portion of the Phase II Property to assess for potential soil impacts resulting from the presence of the former parking area.	7-10 m; For geotechnical and coverage purposes
BH2-23	Placed on the south-central portion of the Phase II Property to assess for potential soil and/or groundwater impacts resulting from the presence of the existing roadway.	7-10 m; Drill to intercept water table for monitoring well installation. Core bedrock if there is no evidence of water in the overburden.
BH3-23	Placed on the central portion of the Phase II Property for geotechnical and general coverage purposes.	7-10 m; For geotechnical and coverage purposes
BH4-23	Placed on the north-central portion of the Phase II Property to assess for potential soil impacts resulting from the presence of the existing roadway.	7-10 m; For geotechnical and coverage purposes
BH5-23	Placed on the east portion of the Phase II Property to assess for geotechnical and general coverage purposes.	7-10 m; For geotechnical and coverage purposes
BH6-23	Placed on the south-central portion of the Phase II Property to assess for potential soil and/or groundwater impacts resulting from the presence of the existing roadway.	7-10 m; Drill to intercept water table for monitoring well installation. Core bedrock if there is no evidence of water in the overburden.
HTP1	Placed within traffic island to assess for potential impacts within roadway. Due to the presence of several nearby utilities, only a shallow hand dug hole is possible.	0.75 m maximum.
HTP2	Placed on the south portion of the subject property to assess for potential impacts immediately adjacent to roadway. Due to the presence of several nearby utilities, only a shallow hand dug hole is possible.	0.75 m maximum.

Borehole locations are shown on Drawing PE6304-3 – 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 until practical refusal to augering. 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 boreholes for the collection of groundwater samples.

2.0 ANALYTICAL TESTING PROGRAM

The analytical testing program for soil at the subject site 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 subject site 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 TO SAMPLING & ANALYSIS PLAN

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.

SOIL PROFILE AND TEST DATA

PHASE II - ENVIRONMENTAL SITE ASSESSMENT

1440 Blair Tower Place, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 374659.712 **NORTHING:** 5033074.891 **ELEVATION:** 80.14

PROJECT: Proposed Residential Development

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: November 7, 2023

FILE NO. **PE6304**

HOLE NO. BH 1-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	ANALYTICAL TESTS	DEPTH (m)	PID (ppm) 0 16.67 33.33 50	Gas Tech (ppm) 0 50 100 150 200	Monitoring Well Construction
Ground Surface EL 80.14 m									
TOPSOIL 0.18 m EL 79.96 m		AU1				0	2.1		
FILL: Brown silty sand with gravel and crushed stone 1.45 m EL 78.69 m		SS2	17	7		1	1.7		
		SS3	25	7		2	2.2		
GLACIAL TILL: Loose to very dense, brown silty sand with gravel, occasional cobbles and boulders, trace clay		SS4	62	41		3	2.1		
- grey by 3.9m depth		SS5	79	50+			3.9		
		SS6	25	50+		4	2.6		
4.8 m EL 75.34 m		SS7	17	50+			2.8		
		RC1	80	33		5			
BEDROCK: Poor to fair quality, black shale		RC2	100	98		6			
- excellent quality by 6.0m depth						7			
		RC3	100	95		8			
- vertical fracture from 7.5 to 7.7m depth.						9			
9.02 m EL 71.12 m									
End of Borehole						10			
						11			

SOIL PROFILE AND TEST DATA

PHASE II - ENVIRONMENTAL SITE ASSESSMENT

1440 Blair Tower Place, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 374623.796 **NORTHING:** 5033089.578 **ELEVATION:** 80.64

PROJECT: Proposed Residential Development

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: November 7, 2023

FILE NO. PE6304

HOLE NO. BH 2-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	ANALYTICAL TESTS	DEPTH (m)	PID (ppm) 0 16.67 33.33 50	Gas Tech (ppm) 0 50 100 150 200	Monitoring Well Construction
Ground Surface EL 80.64 m									
TOPSOIL 0.18 m EL 80.46 m		AU1				0	4.9		
FILL: Brown silty sand with topsoil, some gravel and crushed stone 0.84 m EL 79.8 m		SS2	50	12		1	2.2		
FILL: Brown silty sand, some gravel, trace clay, occasional shale fragments 1.45 m EL 79.19 m		SS3	25	8		2	2.5		
GLACIAL TILL: Compact to very dense, brown silty sand, some gravel, occasional cobbles		SS4	88	25		3	2.6		
		SS5	58	50+			2.5		
		RC1	64	11		4			
4.98 m EL 75.66 m						5			
BEDROCK: Very poor quality, black shale		RC2	67	17		6			
- excellent quality by 6.2m depth		RC3	100	100		7			
		RC4	100	100		8			
9.2 m EL 71.44 m						9			
End of Borehole (GWL @ 3.55m - Nov. 15, 2023)						10			
						11			

SOIL PROFILE AND TEST DATA

PHASE II - ENVIRONMENTAL SITE ASSESSMENT

1440 Blair Tower Place, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 374614.814 **NORTHING:** 5033110.827 **ELEVATION:** 80.42

PROJECT: Proposed Residential Development

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: November 8, 2023

FILE NO. **PE6304**

HOLE NO. BH 3-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	ANALYTICAL TESTS	DEPTH (m)	PID (ppm) 0 16.67 33.33 50	Gas Tech (ppm) 0 50 100 150 200	Monitoring Well Construction
Ground Surface EL 80.42 m									
TOPSOIL 0.23 m EL 80.19 m		AU1				0	2.1		
FILL: Brown silty sand with crushed stone, trace clay, occasional cobles		SS2	29	10		1	2.5		
1.45 m EL 78.97 m		SS3	54	15		2	3.6		
GLACIAL TILL: Compact, brown silty sand with gravel, occasional cobbles and boulders, trace clay		SS4	79	16		3	4.0		
- shale fragments by 2.3m depth		SS5	25	50+		4	2.9		
		RC1	35	0		5			
4.8 m EL 75.62 m		RC2	77	35		6			
BEDROCK: Poor to fair quality, black shale						7			
- excellent quality by 6.1m depth		RC3	100	100		8			
		RC4	100	100		9			
9.12 m EL 71.3 m						10			
End of Borehole						11			

SOIL PROFILE AND TEST DATA

PHASE II - ENVIRONMENTAL SITE ASSESSMENT

1440 Blair Tower Place, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 374611.967 **NORTHING:** 5033150.584 **ELEVATION:** 80.31

PROJECT: Proposed Residential Development

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: November 8, 2023

FILE NO. PE6304

HOLE NO. BH 4-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	ANALYTICAL TESTS	DEPTH (m)	PID (ppm) 0 16.67 33.33 50	Gas Tech (ppm) 0 50 100 150 200	Monitoring Well Construction
Ground Surface EL 80.31 m									
TOPSOIL 0.15 m EL 80.16 m		AU1				0	2.2		
FILL: Brown silty sand with crushed stone, trace clay 1.45 m EL 78.86 m		SS2	79	6		1	2.4		
		SS3	38	11		2	1.9		
GLACIAL TILL: Loose to compact, brown silty sand, some gravel, trace clay and shale fragments		SS4	71	6		3	3.2		
3.76 m EL 76.55 m		SS5	58	50			1.8		
BEDROCK: Poor quality, black shale		RC1	100	27		4			
		RC2	92	33		5			
- excellent quality by 6.1m depth						6			
		RC3	100	98		7			
		RC4	100	98		8			
9.12 m EL 71.19 m						9			
End of Borehole						10			
						11			

SOIL PROFILE AND TEST DATA

PHASE II - ENVIRONMENTAL SITE ASSESSMENT

1440 Blair Tower Place, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 374659.03 **NORTHING:** 5033116.657 **ELEVATION:** 80.14

PROJECT: Proposed Residential Development

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: November 8, 2023

FILE NO. **PE6304**

HOLE NO. BH 5-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	ANALYTICAL TESTS	DEPTH (m)	PID (ppm) 0 16.67 33.33 50	Gas Tech (ppm) 0 50 100 150 200	Monitoring Well Construction
Ground Surface EL 80.14 m									
TOPSOIL 0.1 m EL 80.04 m		AU1				0	2.6		
FILL: Brown silty sand, trace gravel 0.69 m EL 79.45 m		SS2	42	33		1	12.5		
		SS3	12	3			1.7		
FILL: Brown silty clay with sand, gravel, some shale fragments, occasional cobbles and boulders		SS4	42	2		2	2.6		
		SS5	33	3		3	3.7		
3.73 m EL 76.41 m									
FILL: Brown silty sand with gravel, trace clay and shale fragments		SS6	50	14		4	2.4		
4.9 m EL 75.24 m						5			
		RC1	83	44		6			
BEDROCK: Poor quality, black shale									
- excellent quality by 6.2m depth		RC2	100	95		7			
		RC3				8			
8.86 m EL 71.28 m						9			
End of Borehole						10			
						11			

SOIL PROFILE AND TEST DATA

PHASE II - ENVIRONMENTAL SITE ASSESSMENT

1440 Blair Tower Place, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 374581.69 **NORTHING:** 5033155.076 **ELEVATION:** 80.26

PROJECT: Proposed Residential Development

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: November 9, 2023

FILE NO. PE6304

HOLE NO. BH 6-23

SAMPLE DESCRIPTION	STRATA PLOT	Sample No.	SAMPLE % RECOVERY	N VALUE or RQD	ANALYTICAL TESTS	DEPTH (m)	PID (ppm) 0 16.67 33.33 50	Gas Tech (ppm) 0 50 100 150 200	Monitoring Well Construction
Ground Surface EL 80.26 m									
TOPSOIL 0.25 m EL 80.01 m		AU1				0	5.5		
FILL: Brown silty sand with crushed stone, some to trace clay		SS2	42	8		1	0.9		
1.68 m EL 78.58 m		SS3	8	3		2	0.6		
FILL: Brown silty clay with sand 2.44 m EL 77.82 m		SS4	79	38		3	0.8		
GLACIAL TILL: Dense, brown silty sand with gravel and shale fragments, occasional cobbles 3.2 m EL 77.06 m		SS5	75	50+			1.2		
BEDROCK: Poor to fair quality, black shale		RC1	72	40		4			
- excellent quality by 6.2m depth		RC2	100	57		5			
		RC3	100	95		6			
		RC4	100	100		7			
9.17 m EL 71.09 m End of Borehole						8			
(GWL @ 2.60m - Nov. 15, 2023)						9			
						10			
						11			

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 x 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

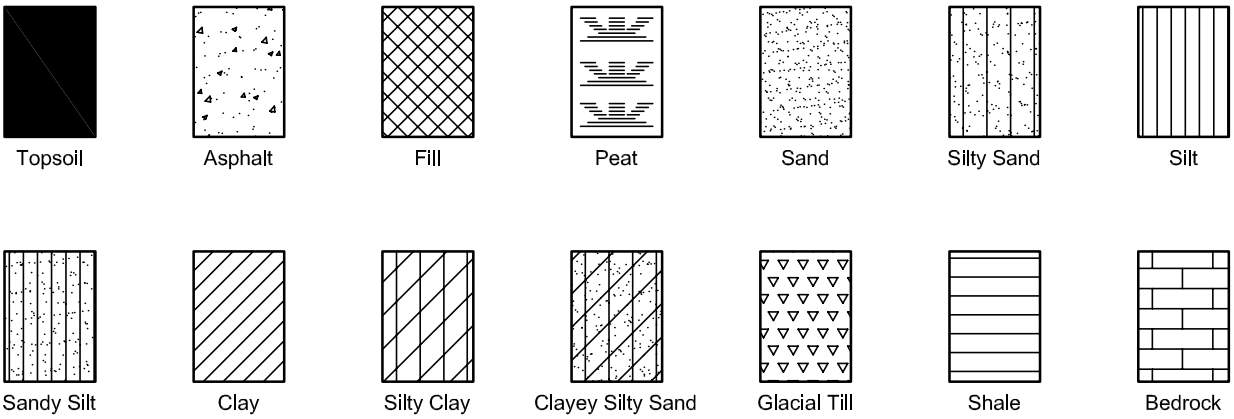
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void 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.

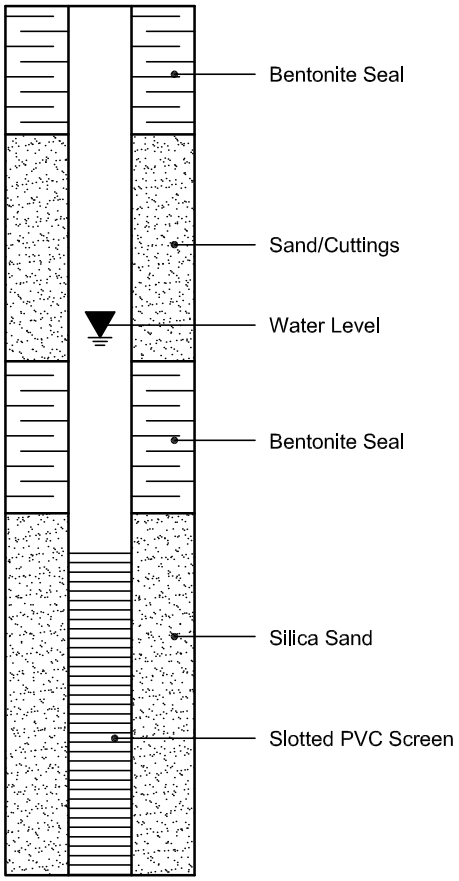
SYMBOLS AND TERMS (continued)

STRATA PLOT

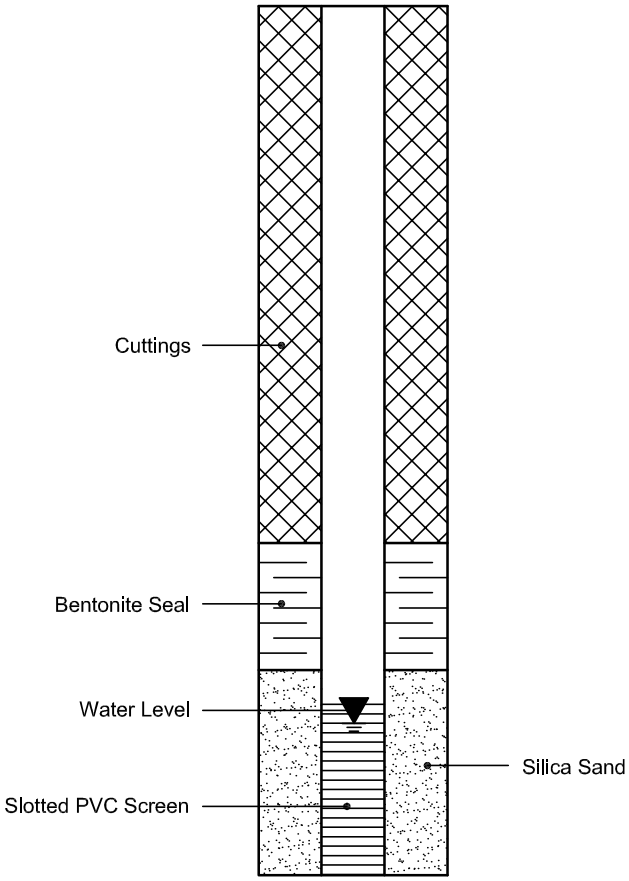


MONITORING WELL AND PIEZOMETER CONSTRUCTION

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: Jeremy Camposarcone

Client PO: 58785
Project: PE6304
Custody: 141995

Report Date: 14-Nov-2023
Order Date: 8-Nov-2023

Order #: 2345344

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

Paracel ID	Client ID
2345344-01	BH1-23-SS3
2345344-02	BH2-23-SS4
2345344-03	HTP1-G1
2345344-04	HTP2-G1

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	10-Nov-23	11-Nov-23
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	9-Nov-23	14-Nov-23
Conductivity	MOE E3138 - probe @25 °C, water ext	10-Nov-23	10-Nov-23
Mercury by CVAA	EPA 7471B - CVAA, digestion	10-Nov-23	10-Nov-23
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	9-Nov-23	9-Nov-23
PHC F1	CWS Tier 1 - P&T GC-FID	10-Nov-23	11-Nov-23
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	9-Nov-23	10-Nov-23
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	10-Nov-23	10-Nov-23
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	9-Nov-23	14-Nov-23
SAR	Calculated	10-Nov-23	13-Nov-23
Solids, %	CWS Tier 1 - Gravimetric	9-Nov-23	10-Nov-23

	Client ID:	BH1-23-SS3	BH2-23-SS4	HTP1-G1	HTP2-G1	-	-
	Sample Date:	07-Nov-23 09:00	07-Nov-23 09:00	08-Nov-23 09:00	08-Nov-23 09:00		
	Sample ID:	2345344-01	2345344-02	2345344-03	2345344-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	87.4	89.2	78.5	93.3	-	-
General Inorganics							
SAR	0.01 N/A	2.93	4.72	0.81	0.09	-	-
Conductivity	5 uS/cm	348	416	171	125	-	-
pH	0.05 pH Units	-	7.37	-	-	-	-
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Arsenic	1.0 ug/g	5.9	5.7	3.0	1.4	-	-
Barium	1.0 ug/g	86.7	57.4	54.4	53.7	-	-
Beryllium	0.5 ug/g	0.7	0.5	<0.5	<0.5	-	-
Boron	5.0 ug/g	6.9	6.2	<5.0	6.3	-	-
Cadmium	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	-	-
Chromium (VI)	0.2 ug/g	<0.2	<0.2	<0.2	<0.2	-	-
Chromium	5.0 ug/g	21.6	17.0	16.3	9.5	-	-
Cobalt	1.0 ug/g	9.7	11.1	4.2	2.0	-	-
Copper	5.0 ug/g	32.9	29.4	9.7	<5.0	-	-
Lead	1.0 ug/g	10.8	9.2	7.5	6.4	-	-
Mercury	0.1 ug/g	<0.1	<0.1	<0.1	<0.1	-	-
Molybdenum	1.0 ug/g	1.0	<1.0	1.3	<1.0	-	-
Nickel	5.0 ug/g	24.1	20.0	8.7	<5.0	-	-
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	<1.0	<1.0	1.4	<1.0	-	-
Vanadium	10.0 ug/g	30.4	25.7	26.2	<10.0	-	-

Certificate of Analysis

Report Date: 14-Nov-2023

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

Order Date: 8-Nov-2023

Client PO: **58785**

Project Description: **PE6304**

	Client ID:	BH1-23-SS3	BH2-23-SS4	HTP1-G1	HTP2-G1	-	-
	Sample Date:	07-Nov-23 09:00	07-Nov-23 09:00	08-Nov-23 09:00	08-Nov-23 09:00		
	Sample ID:	2345344-01	2345344-02	2345344-03	2345344-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Metals							
Zinc	20.0 ug/g	58.3	50.8	37.9	20.3	-	-
Volatiles							
Benzene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	-	-
Ethylbenzene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	-	-
Toluene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	-	-
m,p-Xylenes	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	-	-
Toluene-d8	Surrogate	102%	98.8%	104%	97.1%	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	<7	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g	<4	<4	<4	<4	-	-
F3 PHCs (C16-C34)	8 ug/g	<8	<8	<8	<8	-	-
F4 PHCs (C34-C50)	6 ug/g	<6	<6	<6	<6	-	-
Semi-Volatiles							
Acenaphthene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Acenaphthylene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Anthracene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Chrysene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g	-	<0.02	<0.02	-	-	-

	Client ID:	BH1-23-SS3	BH2-23-SS4	HTP1-G1	HTP2-G1	-	-
	Sample Date:	07-Nov-23 09:00	07-Nov-23 09:00	08-Nov-23 09:00	08-Nov-23 09:00		
	Sample ID:	2345344-01	2345344-02	2345344-03	2345344-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
Fluoranthene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Fluorene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g	-	<0.02	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g	-	<0.02	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g	-	<0.04	<0.04	-	-	-
Naphthalene	0.01 ug/g	-	<0.01	<0.01	-	-	-
Phenanthrene	0.02 ug/g	-	<0.02	<0.02	-	-	-
Pyrene	0.02 ug/g	-	<0.02	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	-	64.4%	64.8%	-	-	-
Terphenyl-d14	Surrogate	-	54.7%	37.5% [1]	-	-	-

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	*1.44*		*%*	*108*	*50-140*			
Surrogate: Terphenyl-d14	*1.60*		*%*	*120*	*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	*3.13*		*%*	*97.9*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	0.34	0.01	N/A	0.33			3.0	30	
Conductivity	172	5	uS/cm	168			2.4	5	
pH	7.20	0.05	pH Units	7.13			1.0	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)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	3.8	1.0	ug/g	3.7			5.0	30	
Barium	19.1	1.0	ug/g	18.4			3.8	30	
Beryllium	0.6	0.5	ug/g	0.5			11.6	30	
Boron	45.0	5.0	ug/g	41.1			9.2	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	15.4	5.0	ug/g	14.9			3.2	30	
Cobalt	7.8	1.0	ug/g	7.4			5.3	30	
Copper	24.7	5.0	ug/g	22.9			7.4	30	
Lead	4.3	1.0	ug/g	3.9			8.3	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	1.1	1.0	ug/g	ND			NC	30	
Nickel	16.1	5.0	ug/g	15.3			4.9	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	19.9	10.0	ug/g	18.7			5.9	30	
Zinc	32.3	20.0	ug/g	30.6			5.3	30	
Physical Characteristics									

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
% Solids	88.0	0.1	% by Wt.	87.4			0.7	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			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	ND	0.02	ug/g	ND			NC	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	ND			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	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*0.872*		*%*		*54.1*	*50-140*			
Surrogate: Terphenyl-d14	*0.630*		*%*		*39.1*	*50-140*			*S-04*
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	*3.62*		*%*		*102*	*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)	174	7	ug/g	ND	101	85-115			
F2 PHCs (C10-C16)	95	4	ug/g	ND	98.5	60-140			
F3 PHCs (C16-C34)	233	8	ug/g	ND	98.5	60-140			
F4 PHCs (C34-C50)	183	6	ug/g	ND	122	60-140			
Metals									
Arsenic	51.5	1.0	ug/g	1.5	100	70-130			
Barium	57.8	1.0	ug/g	7.4	101	70-130			
Beryllium	48.3	0.5	ug/g	ND	96.1	70-130			
Boron	64.8	5.0	ug/g	16.4	96.8	70-130			
Cadmium	46.4	0.5	ug/g	ND	92.7	70-130			
Chromium (VI)	4.8	0.2	ug/g	ND	89.5	70-130			
Chromium	59.7	5.0	ug/g	6.0	107	70-130			
Cobalt	53.9	1.0	ug/g	3.0	102	70-130			
Copper	56.7	5.0	ug/g	9.2	95.0	70-130			
Lead	49.0	1.0	ug/g	1.6	94.9	70-130			
Mercury	1.37	0.1	ug/g	ND	91.0	70-130			
Molybdenum	50.3	1.0	ug/g	ND	100	70-130			
Nickel	54.6	5.0	ug/g	6.1	96.9	70-130			
Selenium	45.6	1.0	ug/g	ND	91.0	70-130			
Silver	42.6	0.3	ug/g	ND	85.3	70-130			
Thallium	46.1	1.0	ug/g	ND	92.0	70-130			
Uranium	48.0	1.0	ug/g	ND	95.7	70-130			
Vanadium	60.9	10.0	ug/g	ND	107	70-130			
Zinc	60.4	20.0	ug/g	ND	96.3	70-130			
Semi-Volatiles									
Acenaphthene	0.156	0.02	ug/g	ND	77.6	50-140			
Acenaphthylene	0.170	0.02	ug/g	ND	84.4	50-140			
Anthracene	0.189	0.02	ug/g	ND	94.1	50-140			
Benzo [a] anthracene	0.169	0.02	ug/g	ND	83.8	50-140			
Benzo [a] pyrene	0.129	0.02	ug/g	ND	64.1	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	0.150	0.02	ug/g	ND	74.6	50-140			
Benzo [g,h,i] perylene	0.122	0.02	ug/g	ND	60.7	50-140			
Benzo [k] fluoranthene	0.175	0.02	ug/g	ND	87.1	50-140			
Chrysene	0.156	0.02	ug/g	ND	77.6	50-140			
Dibenzo [a,h] anthracene	0.128	0.02	ug/g	ND	63.6	50-140			
Fluoranthene	0.192	0.02	ug/g	ND	95.4	50-140			
Fluorene	0.152	0.02	ug/g	ND	75.4	50-140			
Indeno [1,2,3-cd] pyrene	0.117	0.02	ug/g	ND	58.0	50-140			
1-Methylnaphthalene	0.111	0.02	ug/g	ND	55.0	50-140			
2-Methylnaphthalene	0.119	0.02	ug/g	ND	59.1	50-140			
Naphthalene	0.132	0.01	ug/g	ND	65.6	50-140			
Phenanthrene	0.150	0.02	ug/g	ND	74.8	50-140			
Pyrene	0.194	0.02	ug/g	ND	96.4	50-140			
Surrogate: 2-Fluorobiphenyl	*1.06*		*%*		*65.7*	*50-140*			
Surrogate: Terphenyl-d14	*0.807*		*%*		*50.1*	*50-140*			
Volatiles									
Benzene	3.07	0.02	ug/g	ND	76.7	60-130			
Ethylbenzene	2.89	0.05	ug/g	ND	72.3	60-130			
Toluene	3.40	0.05	ug/g	ND	84.9	60-130			
m,p-Xylenes	7.39	0.05	ug/g	ND	92.4	60-130			
o-Xylene	3.77	0.05	ug/g	ND	94.3	60-130			
Surrogate: Toluene-d8	*2.87*		*%*		*89.7*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1: The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

QC Qualifiers:

S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

Sample Data Revisions:

None

Certificate of Analysis

Report Date: 14-Nov-2023

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

Order Date: 8-Nov-2023

Client PO: 58785

Project Description: PE6304

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

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 ID: 2345344

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2345344	№ 141995

Page 1 of 1

Client Name: Paterson Group	Project Ref: PE6304
Contact Name: Jeremy Camposarcone	Quote #:
Address: 9 Auriga Drive	PO #: 58785
Telephone: 613-226-7381	E-mail: jcamposarcone@patersongroup.ca amerryfield@patersongroup.ca

Turnaround Time

☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular

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)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	pH	EC/SAR	Reg 153 soil/groundwater metals		
1	BH1-23-SS3	S		2	11/7/2023		✓								✓	✓		
2	BH2-23-SS4	↓		↓	"	"	✓		✓					✓	✓	✓		
3	HTP1-G1				11/8/2023		✓		✓						✓	✓		
4	HTP2-G1	↓		↓	"	"	✓								✓	✓		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Jeremy Camposarcone	Date/Time:	Date/Time: Nov 8 2023 16:16	Date/Time: Nov 9 2023 11:17
Date/Time: Nov 8, 2023	Temperature: °C	Temperature: 9.9 °C	pH Verified: ☐ By: NH

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Certificate of Analysis

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

Client PO: 58802
Project: PE6304
Custody:

Report Date: 16-Nov-2023
Order Date: 13-Nov-2023

Order #: 2346111

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

Paracel ID	Client ID
2346111-01	BH4-23-SS4
2346111-02	BH6-23-SS2
2346111-03	DUP

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	14-Nov-23	15-Nov-23
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	14-Nov-23	15-Nov-23
Conductivity	MOE E3138 - probe @25 °C, water ext	15-Nov-23	15-Nov-23
Mercury by CVAA	EPA 7471B - CVAA, digestion	15-Nov-23	15-Nov-23
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	14-Nov-23	14-Nov-23
PHC F1	CWS Tier 1 - P&T GC-FID	14-Nov-23	15-Nov-23
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	14-Nov-23	15-Nov-23
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	15-Nov-23	15-Nov-23
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	14-Nov-23	15-Nov-23
SAR	Calculated	15-Nov-23	16-Nov-23
Solids, %	CWS Tier 1 - Gravimetric	14-Nov-23	15-Nov-23

	Client ID:	BH4-23-SS4	BH6-23-SS2	DUP	-	-	-
	Sample Date:	08-Nov-23 09:00	09-Nov-23 09:00	08-Nov-23 09:00	-		
	Sample ID:	2346111-01	2346111-02	2346111-03	-		
	Matrix:	Soil	Soil	Soil	-		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	75.6	90.3	78.8	-	-	-
General Inorganics							
SAR	0.01 N/A	2.25	1.77	2.62	-	-	-
Conductivity	5 uS/cm	312	259	379	-	-	-
pH	0.05 pH Units	-	7.07	-	-	-	-
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	-	-	-
Arsenic	1.0 ug/g	5.5	6.1	6.1	-	-	-
Barium	1.0 ug/g	137	83.5	147	-	-	-
Beryllium	0.5 ug/g	1.3	0.8	1.3	-	-	-
Boron	5.0 ug/g	9.1	7.5	7.2	-	-	-
Cadmium	0.5 ug/g	<0.5	<0.5	0.7	-	-	-
Chromium (VI)	0.2 ug/g	<0.2	<0.2	<0.2	-	-	-
Chromium	5.0 ug/g	38.0	25.6	35.4	-	-	-
Cobalt	1.0 ug/g	16.1	14.6	13.9	-	-	-
Copper	5.0 ug/g	54.8	34.4	52.0	-	-	-
Lead	1.0 ug/g	18.1	19.6	18.7	-	-	-
Mercury	0.1 ug/g	<0.1	<0.1	0.1	-	-	-
Molybdenum	1.0 ug/g	1.6	1.4	1.5	-	-	-
Nickel	5.0 ug/g	43.5	31.7	39.5	-	-	-
Selenium	1.0 ug/g	<1.0	<1.0	<1.0	-	-	-
Silver	0.3 ug/g	<0.3	<0.3	<0.3	-	-	-
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	-	-	-
Uranium	1.0 ug/g	2.0	<1.0	2.7	-	-	-
Vanadium	10.0 ug/g	45.3	33.6	42.6	-	-	-

Certificate of Analysis

Report Date: 16-Nov-2023

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

Order Date: 13-Nov-2023

Client PO: **58802**

Project Description: PE6304

	Client ID:	BH4-23-SS4	BH6-23-SS2	DUP	-		
	Sample Date:	08-Nov-23 09:00	09-Nov-23 09:00	08-Nov-23 09:00	-	-	-
	Sample ID:	2346111-01	2346111-02	2346111-03	-		
	Matrix:	Soil	Soil	Soil	-		
	MDL/Units						
Metals							
Zinc	20.0 ug/g	104	60.9	101	-	-	-
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	99.9%	94.5%	105%	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	<7	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g	<4	<4	16	-	-	-
F3 PHCs (C16-C34)	8 ug/g	<8	<8	22	-	-	-
F4 PHCs (C34-C50)	6 ug/g	<6	<6	<6	-	-	-
Semi-Volatiles							
Acenaphthene	0.02 ug/g	-	<0.02	-	-	-	-
Acenaphthylene	0.02 ug/g	-	<0.02	-	-	-	-
Anthracene	0.02 ug/g	-	<0.02	-	-	-	-
Benzo [a] anthracene	0.02 ug/g	-	<0.02	-	-	-	-
Benzo [a] pyrene	0.02 ug/g	-	<0.02	-	-	-	-
Benzo [b] fluoranthene	0.02 ug/g	-	<0.02	-	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g	-	<0.02	-	-	-	-
Benzo [k] fluoranthene	0.02 ug/g	-	<0.02	-	-	-	-
Chrysene	0.02 ug/g	-	<0.02	-	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g	-	<0.02	-	-	-	-

	Client ID:	BH4-23-SS4	BH6-23-SS2	DUP	-		
	Sample Date:	08-Nov-23 09:00	09-Nov-23 09:00	08-Nov-23 09:00	-	-	-
	Sample ID:	2346111-01	2346111-02	2346111-03	-		
	Matrix:	Soil	Soil	Soil	-		
	MDL/Units						
Semi-Volatiles							
Fluoranthene	0.02 ug/g	-	<0.02	-	-	-	-
Fluorene	0.02 ug/g	-	<0.02	-	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g	-	<0.02	-	-	-	-
1-Methylnaphthalene	0.02 ug/g	-	<0.02	-	-	-	-
2-Methylnaphthalene	0.02 ug/g	-	<0.02	-	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g	-	<0.04	-	-	-	-
Naphthalene	0.01 ug/g	-	<0.01	-	-	-	-
Phenanthrene	0.02 ug/g	-	<0.02	-	-	-	-
Pyrene	0.02 ug/g	-	<0.02	-	-	-	-
2-Fluorobiphenyl	Surrogate	-	68.4%	-	-	-	-
Terphenyl-d14	Surrogate	-	53.1%	-	-	-	-

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	*0.936*		*%*	*70.2*	*50-140*			
Surrogate: Terphenyl-d14	*0.775*		*%*	*58.2*	*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	*3.06*		*%*	*95.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	2.08	0.01	N/A	2.05			1.5	30	
Conductivity	303	5	uS/cm	302			0.6	5	
pH	6.79	0.05	pH Units	6.93			2.0	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)	72	8	ug/g	50			NC	30	
F4 PHCs (C34-C50)	20	6	ug/g	18			11.8	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	1.4	1.0	ug/g	1.3			7.0	30	
Barium	11.3	1.0	ug/g	11.4			1.2	30	
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron	ND	5.0	ug/g	ND			NC	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	7.3	5.0	ug/g	6.9			5.9	30	
Cobalt	1.7	1.0	ug/g	1.7			1.2	30	
Copper	ND	5.0	ug/g	ND			NC	30	
Lead	1.8	1.0	ug/g	1.8			1.7	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	ND	5.0	ug/g	ND			NC	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	16.9	10.0	ug/g	15.8			6.8	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	90.1	0.1	% by Wt.	90.7			0.7	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	0.087	0.02	ug/g	0.039			NC	40	
Benzo [a] anthracene	0.167	0.02	ug/g	0.117			34.7	40	
Benzo [a] pyrene	0.116	0.02	ug/g	0.072			NC	40	
Benzo [b] fluoranthene	0.138	0.02	ug/g	0.097			34.7	40	
Benzo [g,h,i] perylene	0.079	0.02	ug/g	0.048			NC	40	
Benzo [k] fluoranthene	0.089	0.02	ug/g	0.054			NC	40	
Chrysene	0.134	0.02	ug/g	0.123			8.6	40	
Dibenzo [a,h] anthracene	0.021	0.02	ug/g	ND			NC	40	
Fluoranthene	0.406	0.02	ug/g	0.267			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	0.073	0.02	ug/g	0.045			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	0.274	0.02	ug/g	0.155			NC	40	
Pyrene	0.311	0.02	ug/g	0.206			NC	40	
Surrogate: 2-Fluorobiphenyl	*1.09*		*%*		*73.8*	*50-140*			
Surrogate: Terphenyl-d14	*0.755*		*%*		*50.9*	*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	*3.70*		*%*		*102*	*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)	176	7	ug/g	ND	88.2	85-115			
F2 PHCs (C10-C16)	99	4	ug/g	ND	110	60-140			
F3 PHCs (C16-C34)	351	8	ug/g	50	137	60-140			
F4 PHCs (C34-C50)	201	6	ug/g	18	131	60-140			
Metals									
Antimony	36.8	1.0	ug/g	ND	73.6	70-130			
Arsenic	52.0	1.0	ug/g	ND	103	70-130			
Barium	53.8	1.0	ug/g	4.6	98.5	70-130			
Beryllium	49.7	0.5	ug/g	ND	99.3	70-130			
Boron	48.3	5.0	ug/g	ND	94.5	70-130			
Cadmium	49.0	0.5	ug/g	ND	97.9	70-130			
Chromium (VI)	0.1	0.2	ug/g	ND	65.0	70-130			QM-05
Chromium	55.6	5.0	ug/g	ND	106	70-130			
Cobalt	51.3	1.0	ug/g	ND	101	70-130			
Copper	49.6	5.0	ug/g	ND	96.6	70-130			
Lead	45.2	1.0	ug/g	ND	88.8	70-130			
Mercury	1.40	0.1	ug/g	ND	93.5	70-130			
Molybdenum	50.6	1.0	ug/g	ND	101	70-130			
Nickel	51.4	5.0	ug/g	ND	100	70-130			
Selenium	47.3	1.0	ug/g	ND	94.4	70-130			
Silver	42.8	0.3	ug/g	ND	85.7	70-130			
Thallium	49.1	1.0	ug/g	ND	98.2	70-130			
Uranium	48.5	1.0	ug/g	ND	96.7	70-130			
Vanadium	59.7	10.0	ug/g	ND	107	70-130			
Zinc	49.3	20.0	ug/g	ND	92.7	70-130			
Semi-Volatiles									
Acenaphthene	0.165	0.02	ug/g	ND	88.8	50-140			
Acenaphthylene	0.168	0.02	ug/g	ND	90.7	50-140			
Anthracene	0.256	0.02	ug/g	0.039	117	50-140			
Benzo [a] anthracene	0.291	0.02	ug/g	0.117	93.8	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] pyrene	0.215	0.02	ug/g	0.072	77.3	50-140			
Benzo [b] fluoranthene	0.257	0.02	ug/g	0.097	86.0	50-140			
Benzo [g,h,i] perylene	0.188	0.02	ug/g	0.048	75.6	50-140			
Benzo [k] fluoranthene	0.243	0.02	ug/g	0.054	102	50-140			
Chrysene	0.272	0.02	ug/g	0.123	80.1	50-140			
Dibenzo [a,h] anthracene	0.141	0.02	ug/g	ND	75.8	50-140			
Fluoranthene	0.537	0.02	ug/g	0.267	145	50-140			QM-06
Fluorene	0.157	0.02	ug/g	ND	84.5	50-140			
Indeno [1,2,3-cd] pyrene	0.192	0.02	ug/g	0.045	79.1	50-140			
1-Methylnaphthalene	0.111	0.02	ug/g	ND	59.9	50-140			
2-Methylnaphthalene	0.118	0.02	ug/g	ND	63.5	50-140			
Naphthalene	0.142	0.01	ug/g	ND	76.6	50-140			
Phenanthrene	0.374	0.02	ug/g	0.155	118	50-140			
Pyrene	0.447	0.02	ug/g	0.206	130	50-140			
Surrogate: 2-Fluorobiphenyl	*0.929*		*%*		*62.6*	*50-140*			
Surrogate: Terphenyl-d14	*0.771*		*%*		*51.9*	*50-140*			
Volatiles									
Benzene	3.95	0.02	ug/g	ND	98.7	60-130			
Ethylbenzene	3.53	0.05	ug/g	ND	88.2	60-130			
Toluene	4.01	0.05	ug/g	ND	100	60-130			
m,p-Xylenes	8.96	0.05	ug/g	ND	112	60-130			
o-Xylene	4.62	0.05	ug/g	ND	116	60-130			
Surrogate: Toluene-d8	*2.74*		*%*		*85.6*	*50-140*			

Qualifier Notes:

QC Qualifiers:

QM-05	The spike recovery was outside acceptance limits for the matrix spike due to matrix interference.
QM-06	Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

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

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.

PARACEL LABORATORIES LTD.

Paracel ID: 2346111

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2346111	

Client Name: Paterson Group
Contact Name: Jeremy Camposarcone
Address: 9 Auriga Drive
Telephone: 613-226-7381

Project Ref: PE6304
Quote #:
PO #: 58802
E-mail: jcamposarcone@patersongroup.ca
amoynhart@patersongroup.ca

Page 1 of 1

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☑ Regular
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	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	pH	EC/SAR	Reg 153 Soil Surface metals		
1	BH4-23-SS4	S		2	11/8/2023		✓								✓	✓		
2	BH6-23-SS2	↓		↓	11/9/2023		✓		✓					✓	✓	✓		
3	DUP	↓		↓	11/8/2023		✓								✓	✓		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign):	Received at Depot:	Received at Lab: HP	Verified By: SD
Relinquished By (Print): Jeremy Camposarcone	Date/Time:	Date/Time: Nov 13, 23 | 16:50	Date/Time: Nov 14 2023 9:21am
Date/Time: 11/9/2023	Temperature: °C	Temperature: 10.7 °C	pH Verified: ☐ By:

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Certificate of Analysis

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

Client PO: 58861
Project: PE6304
Custody: 136931

Report Date: 21-Nov-2023
Order Date: 16-Nov-2023

Order #: 2346438

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

Paracel ID	Client ID
2346438-01	BH2-23-GW1
2346438-02	BH6-23-GW1
2346438-03	BH4-GW
2346438-04	DUP-Nov15

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 624 - P&T GC-MS	17-Nov-23	17-Nov-23
Chromium, hexavalent - water	MOE E3056 - colourimetric	17-Nov-23	17-Nov-23
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	17-Nov-23	17-Nov-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	17-Nov-23	17-Nov-23
PHC F1	CWS Tier 1 - P&T GC-FID	17-Nov-23	17-Nov-23
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	20-Nov-23	20-Nov-23
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	20-Nov-23	20-Nov-23

Certificate of Analysis

Report Date: 21-Nov-2023

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

Order Date: 16-Nov-2023

Client PO: **58861**

Project Description: PE6304

	Client ID:	BH2-23-GW1	BH6-23-GW1	BH4-GW	DUP-Nov15	-	-
	Sample Date:	15-Nov-23 09:00	15-Nov-23 09:00	15-Nov-23 09:00	15-Nov-23 09:00		
	Sample ID:	2346438-01	2346438-02	2346438-03	2346438-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Metals							
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Antimony	0.5 ug/L	0.8	1.5	<0.5	-	-	-
Arsenic	1 ug/L	2	2	<1	-	-	-
Barium	1 ug/L	294	575	57	-	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Boron	10 ug/L	108	465	31	-	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Chromium (VI)	10 ug/L	<10	<10	<10	-	-	-
Chromium	1 ug/L	<1	<1	<1	-	-	-
Cobalt	0.5 ug/L	2.7	0.9	<0.5	-	-	-
Copper	0.5 ug/L	0.9	<0.5	5.2	-	-	-
Lead	0.1 ug/L	0.2	<0.1	<0.1	-	-	-
Molybdenum	0.5 ug/L	2.3	4.8	1.0	-	-	-
Nickel	1 ug/L	8	2	3	-	-	-
Selenium	1 ug/L	<1	2	<1	-	-	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Sodium	200 ug/L	420000	337000	525000	-	-	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Uranium	0.1 ug/L	4.2	4.1	1.3	-	-	-
Vanadium	0.5 ug/L	0.6	0.8	<0.5	-	-	-
Zinc	5 ug/L	<5	<5	<5	-	-	-
Volatiles							
Benzene	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	-	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 21-Nov-2023

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

Order Date: 16-Nov-2023

Client PO: **58861**

Project Description: **PE6304**

	Client ID:	BH2-23-GW1	BH6-23-GW1	BH4-GW	DUP-Nov15	-	-
	Sample Date:	15-Nov-23 09:00	15-Nov-23 09:00	15-Nov-23 09:00	15-Nov-23 09:00		
	Sample ID:	2346438-01	2346438-02	2346438-03	2346438-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Volatiles							
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	-	-
Toluene-d8	Surrogate	105%	107%	108%	108%	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100	-	-
Semi-Volatiles							
Acenaphthene	0.05 ug/L	-	<0.05	-	-	-	-
Acenaphthylene	0.05 ug/L	-	<0.05	-	-	-	-
Anthracene	0.01 ug/L	-	<0.01	-	-	-	-
Benzo [a] anthracene	0.01 ug/L	-	<0.01	-	-	-	-
Benzo [a] pyrene	0.01 ug/L	-	<0.01	-	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	-	<0.05	-	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	-	<0.05	-	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	-	<0.05	-	-	-	-
Chrysene	0.05 ug/L	-	<0.05	-	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	-	<0.05	-	-	-	-
Fluoranthene	0.01 ug/L	-	<0.01	-	-	-	-
Fluorene	0.05 ug/L	-	<0.05	-	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	-	<0.05	-	-	-	-
1-Methylnaphthalene	0.05 ug/L	-	<0.05	-	-	-	-
2-Methylnaphthalene	0.05 ug/L	-	<0.05	-	-	-	-

	Client ID:	BH2-23-GW1	BH6-23-GW1	BH4-GW	DUP-Nov15	-	-
	Sample Date:	15-Nov-23 09:00	15-Nov-23 09:00	15-Nov-23 09:00	15-Nov-23 09:00		
	Sample ID:	2346438-01	2346438-02	2346438-03	2346438-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Semi-Volatiles							
Methylnaphthalene (1&2)	0.10 ug/L	-	<0.10	-	-	-	-
Naphthalene	0.05 ug/L	-	<0.05	-	-	-	-
Phenanthrene	0.05 ug/L	-	<0.05	-	-	-	-
Pyrene	0.01 ug/L	-	<0.01	-	-	-	-
2-Fluorobiphenyl	Surrogate	-	68.9%	-	-	-	-
Terphenyl-d14	Surrogate	-	63.5%	-	-	-	-

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					
Metals								
Mercury	ND	0.1	ug/L					
Antimony	ND	0.5	ug/L					
Arsenic	ND	1	ug/L					
Barium	ND	1	ug/L					
Beryllium	ND	0.5	ug/L					
Boron	ND	10	ug/L					
Cadmium	ND	0.1	ug/L					
Chromium (VI)	ND	10	ug/L					
Chromium	ND	1	ug/L					
Cobalt	ND	0.5	ug/L					
Copper	ND	0.5	ug/L					
Lead	ND	0.1	ug/L					
Molybdenum	ND	0.5	ug/L					
Nickel	ND	1	ug/L					
Selenium	ND	1	ug/L					
Silver	ND	0.1	ug/L					
Sodium	ND	200	ug/L					
Thallium	ND	0.1	ug/L					
Uranium	ND	0.1	ug/L					
Vanadium	ND	0.5	ug/L					
Zinc	ND	5	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					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*14.8*		*%*	*73.9*	*50-140*			
Surrogate: Terphenyl-d14	*13.4*		*%*	*67.1*	*50-140*			
Volatiles								
Benzene	ND	0.5	ug/L					
Ethylbenzene	ND	0.5	ug/L					
Toluene	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: Toluene-d8	*82.8*		*%*	*103*	*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	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	ND	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	21.4	1	ug/L	20.0			6.7	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	21	10	ug/L	21			2.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.96	0.5	ug/L	0.98			2.0	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	3.07	0.5	ug/L	3.08			0.4	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	15800	200	ug/L	16500			4.0	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	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: Toluene-d8	*86.5*		*%*		*108*	*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)	1860	25	ug/L	ND	108	85-115			
F2 PHCs (C10-C16)	1540	100	ug/L	ND	96.2	60-140			
F3 PHCs (C16-C34)	3920	100	ug/L	ND	100	60-140			
F4 PHCs (C34-C50)	2900	100	ug/L	ND	117	60-140			
Metals									
Mercury	2.68	0.1	ug/L	ND	89.4	70-130			
Arsenic	52.9	1	ug/L	ND	105	80-120			
Barium	64.1	1	ug/L	20.0	88.2	80-120			
Beryllium	48.4	0.5	ug/L	ND	96.7	80-120			
Boron	63	10	ug/L	21	83.2	80-120			
Cadmium	45.7	0.1	ug/L	ND	91.4	80-120			
Chromium (VI)	168	10	ug/L	ND	84.0	70-130			
Chromium	53.1	1	ug/L	ND	106	80-120			
Cobalt	50.6	0.5	ug/L	ND	101	80-120			
Copper	48.1	0.5	ug/L	0.98	94.2	80-120			
Lead	45.0	0.1	ug/L	ND	89.9	80-120			
Molybdenum	49.5	0.5	ug/L	3.08	92.8	80-120			
Nickel	50.5	1	ug/L	ND	100	80-120			
Selenium	48.1	1	ug/L	ND	95.9	80-120			
Silver	46.6	0.1	ug/L	ND	93.1	80-120			
Sodium	24300	200	ug/L	16500	78.5	80-120			QM-07
Thallium	43.7	0.1	ug/L	ND	87.3	80-120			
Uranium	49.7	0.1	ug/L	ND	99.3	80-120			
Vanadium	52.9	0.5	ug/L	ND	106	80-120			
Zinc	50	5	ug/L	ND	92.9	80-120			
Semi-Volatiles									
Acenaphthene	4.45	0.05	ug/L	ND	89.0	50-140			
Acenaphthylene	4.73	0.05	ug/L	ND	94.7	50-140			
Anthracene	5.55	0.01	ug/L	ND	111	50-140			
Benzo [a] anthracene	4.94	0.01	ug/L	ND	98.8	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] pyrene	3.75	0.01	ug/L	ND	75.0	50-140			
Benzo [b] fluoranthene	4.51	0.05	ug/L	ND	90.3	50-140			
Benzo [g,h,i] perylene	3.83	0.05	ug/L	ND	76.7	50-140			
Benzo [k] fluoranthene	5.37	0.05	ug/L	ND	107	50-140			
Chrysene	4.49	0.05	ug/L	ND	89.7	50-140			
Dibenzo [a,h] anthracene	3.91	0.05	ug/L	ND	78.2	50-140			
Fluoranthene	6.05	0.01	ug/L	ND	121	50-140			
Fluorene	4.08	0.05	ug/L	ND	81.6	50-140			
Indeno [1,2,3-cd] pyrene	4.09	0.05	ug/L	ND	81.8	50-140			
1-Methylnaphthalene	3.56	0.05	ug/L	ND	71.2	50-140			
2-Methylnaphthalene	3.74	0.05	ug/L	ND	74.8	50-140			
Naphthalene	3.90	0.05	ug/L	ND	78.0	50-140			
Phenanthrene	4.24	0.05	ug/L	ND	84.8	50-140			
Pyrene	6.12	0.01	ug/L	ND	122	50-140			
Surrogate: 2-Fluorobiphenyl	*16.4*		*%*		*81.9*	*50-140*			
Surrogate: Terphenyl-d14	*12.5*		*%*		*62.4*	*50-140*			
Volatiles									
Benzene	44.5	0.5	ug/L	ND	111	60-130			
Ethylbenzene	42.7	0.5	ug/L	ND	107	60-130			
Toluene	45.4	0.5	ug/L	ND	114	60-130			
m,p-Xylenes	78.5	0.5	ug/L	ND	98.2	60-130			
o-Xylene	41.9	0.5	ug/L	ND	105	60-130			
Surrogate: Toluene-d8	*65.2*		*%*		*81.5*	*50-140*			

Qualifier Notes:

QC Qualifiers:

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

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.

PARACE LABORATORIES LTD

Paracel ID: 2346438

vd.
J8
.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2346438	№ 136931

Client Name: Paterson Group
Contact Name: Adrian Menyhart
Address: 9 Auriga Dr.
Telephone: 613-226-7381

Project Ref: PE6304
Quote #:
PO #: 58861
E-mail: amenyhart@patersongroup.ca

Page 1 of 1

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
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	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)					
		Required Analysis																
1	BH2-23-GW1	GW			Nov 15/23	am	X			X	X	X						
2	BH6-23-GW1	↓			↓	↓	X		X	X	X	X						
3	BH4-GW						X			X	X	X						
4	DUP-Nov15						X											
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign):	Received By Driver/Depot:	Received at lab: HP	Verified By: SD
Relinquished By (Print): Derek Lattin	Date/Time:	Date/Time: Nov 16,23 16:50	Date/Time: Nov 17, 2023 9:27a
Date/Time: Nov 16 2023	Temperature: °C	Temperature: 8.9 °C	pH Verified: ☒ By: SD