PATERSON GROUP

Phase II-Environmental Site Assessment

5923 Ottawa Street Ottawa, Ontario
Prepared for Stratford-Fox Run

Report: PE6526-2R
Date: November 14, 2024

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EXECUTIVE SUMMARY

Assessment

A Phase II-ESA was conducted for the property addressed 5923 Ottawa Street, in the City of Ottawa, Ontario. The purpose of the Phase II-ESA was to address one potentially contaminating activity (PCA) that was identified during the Phase I-ESA and was considered to result in an area of potential environmental concern (APEC) on the Phase II Property.

The Phase II-ESA was carried out in conjunction with Geotechnical and Hydrogeological Investigations and consisted of drilling 5 boreholes at the Phase II Property, 4 of which were instrumented with groundwater monitoring wells. Boreholes were placed to address the previously identified APEC and to provide coverage for Geotechnical and Hydrogeological purposes.

Soil samples obtained from the boreholes were screened using visual and olfactory observations as well as organic vapour measurements. A total of 4 soil samples (including one duplicate) were submitted for analysis of metals (including As, Sb, Se), mercury (Hg), hexavalent chromium (CrVI), benzene, toluene, ethylbenzene, xylenes (BTEX), petroleum hydrocarbons (PHCs, F_1-F_4), volatile organic compounds (VOCs), acid base neutrals (ABNs), and/or pH.

Metal parameter concentrations identified in the soil samples analysed comply with the MECP Table 2 Standards as well as MECP Table 1 Standards. Remaining parameters analysed (BTEX, PHCs, VOCs, ABNs, Hg and CrVI) were not identified in the soil samples.

Three groundwater samples (including one duplicate) from monitoring wells installed in BH1-24 and BH3-24 were submitted for laboratory analysis of BTEX, VOCs, Metals, ABNs and/or PHCs (F_1-F_4). No sheen, free product or odour was noted during the groundwater sampling events. Apart from metals, no parameter concentrations were identified in the groundwater samples analysed. Metal concentrations identified were in compliance with the selected MECP Table 2 Standards.

Based on the analytical test results, the soil and groundwater beneath the Phase II Property complies with the selected MECP Table 2 Standards. As such, it is our opinion that no further investigative work is required at this time.

Recommendations

Monitoring Wells

It is recommended that the monitoring wells installed on the Phase II Property remain viable for future monitoring, if required. It is expected that groundwater monitoring wells will be abandoned in accordance with O.Reg.903 at the time of the construction excavation. Further information can be provided upon request in this regard.

O.Reg. 406/19: On-Site and Excess Soil Management

Excess soil that may be generated as part of the development of the Phase II Property must be handled in accordance with O.Reg. 406/19.

1.0 INTRODUCTION

At the request of Stratford-Fox Run, Paterson Group (Paterson) conducted a Phase II-Environmental Site Assessment for 5923 Ottawa Street (herein referred to as the Phase II Property), in the City of Ottawa, Ontario. The purpose of this Phase II-ESA has been to address an area of potential environmental concern (APEC) identified on the Phase II Property, during the Phase I-ESA conducted by Paterson in July of 2024.

1.1 Site Description

Address:	5923 Ottawa Street, Ottawa (Richmond), Ontario
Legal Description:	PCL 10-4, SEC 4D-26; PT UNIT 10, PL 4D-26, PT 4, 4R7050; GOULBOURN
Location:	The Phase II Property is located on the north side of Ottawa Street, approximately 150m west of Eagleson Road, in Ottawa, Ontario. Refer to Figure 1- Key Plan in the Figures section following the text.
Latitude and Longitude:	45° 11’ 30.6" N, 75° 49' 6.2" W

Site Description:

Configuration:	Irregular
Area:	2.27 ha (approximate)

1.2 Property Ownership

The current registered property owner of the Phase II Property is Stratford-Fox Run. Paterson was engaged to conduct this Phase II – ESA by Mr. Joshua Laginski with Inverness Homes on behalf of Mr. Jack Gulas, a representative of Stratford-Fox Run. The head office of Inverness Homes is located at 38 Auriga Drive Suite #200, Ottawa, Ontario. Mr. Laginski can be reached by telephone at (613) 838-3952.

1.3 Current and Proposed Future Uses

The Phase II Property exists as vacant land with a forested area covering much of the north of the property. The study area consists of a mixture of commercial, agricultural, residential and industrial properties.

It is our understanding that a commercial business will be constructed on the Phase II Property. The proposed building will generally be surrounded by asphalt-paved parking, and landscaped areas. It is expected that the proposed development will have private well and sewer services.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 2 of the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by the Ministry of the Environment, Conservation and Parks (MECP), April 2011. The MECP selected Table 2 Standards are based on the following considerations:

- ❒ Coarse-grained soil conditions
- ❒ Full depth generic site conditions
- ❒ Potable groundwater conditions
- ❒ Commercial land use.

Section 35 of O.Reg. 153/04 does apply to the Phase II Property in that properties within 250m of the Phase II Property rely upon potable groundwater.

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 and the pH of the surface soil is between 5 and 9 and the subsurface soil pH is between 5 and 11.

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 commercial standards were selected based on the proposed use of Phase II Property. Coarse grained soil standards were assumed for the purposes of this Phase II ESA.

In addition to comparison to the applicable site condition standards, soil analytical test results were also compared with MECP Table 1 agricultural standards in anticipation of the potential generation of excess soils on the Phase II Property during development.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is a vacant parcel of land situated on the north side of Ottawa Street, west of Eagleson Road, in the City of Ottawa, Ontario, within an area comprised of residential, agricultural, commercial and industrial land uses.

The general area of the Phase II Property slopes down towards the north. Surrounding properties are provided with private water and sewer services. Site drainage consists primarily of infiltration with some sheet drainage to the Ottawa Street roadside ditch.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

A subsurface investigation was conducted on June 17, 2024, in conjunction with a Geotechnical Investigation. The field program consisted of drilling 5 boreholes, 4 of which were instrumented with groundwater monitoring wells. The boreholes were drilled to a maximum depth of 6.7m below the existing grade.

The borehole locations are shown on Drawing PE6526-3 – Test Hole Location Plan, appended to this report.

3.2 Media Investigated

During the subsurface investigation, soil and groundwater samples were obtained with some samples submitted for laboratory analysis. The rationale for sampling and analyzing these samples is based on the Contaminants of Potential Concern identified in the Phase I-ESA.

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

Based on information from the Geological Survey of Canada, bedrock beneath the site area consists of dolostone of the Oxford Formation. It was reported that surficial soils consist of Quaternary sediments, specifically offshore marine sediments, with a drift thickness of 3-5 m on the western portion of the site and 10-15 m on the eastern portion. Hydrogeological conditions are considered to mimic the topographic setting; as a result, groundwater is expected to flow towards Marlborough Creek and ultimately to the Jock River.

Fill Placement

Based on the historical use of the Phase II ESA Property as agricultural land, fill material of unknown quality is not likely present on the Phase II ESA Property.

Areas of Natural Significance

No areas of natural significance were identified in the Phase I Study Area.

Water Bodies

The Marlborough Creek runs in a generally northward direction from southwest of the Phase I Property to north of the Phase I Property. No other natural water bodies were identified in the Phase I Study Area.

Drinking Water Wells

One Well record was identified in the ERIS report as being on the Phase I Property however, this well is considered to be associated with the neighbouring property addressed 5935 Ottawa Street. Potable wells are present and appear to be in use in the Phase I Study Area.

Monitoring Wells

Currently four monitoring wells exist on the Phase II Property, all of which are related to this Phase II Investigation. No records of other monitoring wells were identified within the Phase I Study Area.

Based on the borehole logs from previous investigations conducted in the area of the Phase I Property, general stratigraphy consists of grey clay over limestone bedrock. Static water levels were recorded to be between 0.1 and 0.28mbgs.

Existing Buildings and Structures

There are no buildings or structures present on the Phase II ESA Property.

Subsurface Structures and Utilities

The Phase II Property is not situated in a municipally serviced area. There are no underground utilities and/or structures on the Phase II Property.

Neighbouring Land Use

Neighbouring land use in the Phase I Study Area consists of agricultural, residential, commercial and industrial. Surrounding land use is shown on Drawing PE6526-2 – Surrounding Land Use Plan, attached.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

No PCAs were identified on the Phase II Property. Six off-site PCAs were identified within the Phase I Study Area; one of which is considered to have resulted in an APEC on the Phase II Property, as presented in the table below.

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 (Manufacturing of Measuring, Medical and Controlling Devices)	Southwestern portion of Phase I Property	PCA: N/A (Manufacturing of Measuring, Medical and Controlling Devices)	Off-site	VOCs BTEX PHCs (F1-F4) Metals Hg, CrVI ABNs	Soil Groundwater

The PCA identified as #1 on Drawing PE6256-2 – Surrounding Land Use Plan, has no applicable PCA Item under Table 2 of O.Reg. 153/04 although it is considered to be a potentially contaminating activity and is therefore identified as Not Applicable: Manufacturing of Measuring, Medical and Controlling Devices in Table 1. This PCA is associated with the manufacturing industry on the adjacent property to the west.

It is our understanding that current operations associated with PCA #1 consist of final assembly and repair; no manufacturing has occurred at the property for approximately 20 to 25 years and any previous/existing chemicals used at the property are properly stored and disposed of by licenced contractors. While the associated risk is considered to be low, given the proximity of the site to the Phase II Property, this PCA is considered to represent an APEC on the Phase II Property.

The location of APEC 1 on the Phase I Property is presented on Drawing P6526-1– Site Plan.

Off-site PCAs not considered to result in APECs on the Phase I Property include the following:

- ID #2 – PCA 28: Gasoline and Associated Products Storage in Fixed Tanks) – associated with a furnace oil spill at 5949 Ottawa Street.

- ID #3 – PCA 10: Commercial Autobody Shop – associated with a body shop/paint booth at 5949 Ottawa Street.
- ID #4 – PCA 52: Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems – automotive service garage at 5949 Ottawa Street.
- ID #5 – PCA 46: Rail Yards Tracks and Spurs – rail line north of the Phase I Property
- ID#6 – PCA 40: Pesticides (Including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications – Commercial nursery at 5901 Ottawa Street.

As previously discussed, these PCAs are not considered to result in APECs on the Phase I Property based on separation distance, orientation relative to groundwater flow direction, nature of the activity, low mobility of associated contaminants of potential concern (CPCs) and/or the low permeability/hydraulic conductivity of the underlying silty clay soils.

Contaminants of Potential Concern

As per Table 1, contaminants of potential concern (CPCs) in the soil/groundwater beneath the Phase I Property include the following:

- Petroleum Hydrocarbons Fractions 1 through 4 (PHCs F_1-F_4)
- Benzene, Toluene, Ethylbenzene, Xylene (BTEX)
- Volatile Organic Compounds (VOCs)
- Metals (including arsenic (As), antimony (Sb) and selenium (Se))
- Mercury (Hg)
- Hexavalent Chromium (CrVI)
- Acid/Base/Neutral Compounds (ABNs)

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase II is considered to be sufficient to conclude that there is one PCA that has resulted in an APEC on the Phase II Property.

A variety of independent sources were consulted as part of this assessment, 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 were encountered during the Phase II-ESA program.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation was conducted on June 17, 2024. The field program consisted of drilling 5 boreholes, 4 of which were instrumented with groundwater monitoring wells. The boreholes were drilled to a maximum depth of 6.7m below the existing grade.

The boreholes were placed to address the aforementioned area of potential environmental concern (APEC) and for geotechnical and hydrogeological purposes.

The boreholes were drilled with a track mounted drill rig, operated by George Downing Estate Drilling of Hawkesbury, Ontario, under the full-time supervision of Paterson personnel.

Borehole locations are shown on Drawing PE6526-3 – Test Hole Location Plan appended to this report.

4.2 Soil Sampling

A total of 36 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 0.6m intervals. The depths at which split spoon and auger samples were obtained from the boreholes are shown as "**SS**" and "**AU**" on the Soil Profile and Test Data Sheets.

The site stratigraphy generally consists of topsoil and organics overlying native till. The till consisted of silty fine sand with gravel, cobbles and boulders. Practical refusal was only encountered in BH1-24 at a depth of 3.5m below ground surface.

Specific details of the soil profile at each borehole location are presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

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 PID readings were found to range from 0.2 to 1.1 ppm in the soil samples obtained. These results are not considered to be indicative of potential contamination from volatile contaminants. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

4.4 Groundwater Monitoring Well Installation

Four groundwater monitoring wells were installed on the Phase II Property as part of the subsurface investigation. The monitoring wells consisted of 50mm diameter schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 2 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

Table 2 - Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand /Silt Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH1-24	94.20	3.56	2.06-3.58	1.52-3.58	0.30-1.52	Stick-Up
BH2-24	93.69	6.60	5.08-6.6	1.98-6.6	0.30-1.98	Stick-Up
BH3-24	93.85	6.71	5.19-6.71	2.29-6.71	0.30-2.29	Stick-Up
BH5-24	93.92	5.18	3.66-5.18	2.13-5.18	0.30-2.13	Stick-Up

4.5 Field Measurement of Water Quality Parameters

Groundwater sampling was conducted on June 25, 2024. Water quality parameters were measured in the field using a multi-parameter analyzer. Parameters measured in the field included temperature, pH, and electrical conductivity.

Field parameters were measured after each well volume purged. Wells were purged prior to sampling until at least three well volumes had been removed, the field parameters were relatively stable, or the well was dry. Stabilized field parameter values are summarized in Table 3.

Table 3 - Field Measurement of Water Quality Parameters – June 25, 2024

Parameter	BH1-24	BH3-24
Temperature (°C)	14.1	12.1
pH	7.71	7.73
Electrical Conductivity (µS/cm)	610	844

4.6 Groundwater Sampling

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

4.7 Analytical Testing

Based on the guidelines outlined in the Sampling and Analysis Plan, appended to this report, the following soil samples were submitted for analysis:

Table 4 - Soil Samples Submitted for Analysis

Sample ID	Screened Interval/ Stratigraphic Unit	Parameter Analyzed								Rationale
		Metals[1]	Hg	Cr^{VI}	BTEX	PHCs F_1-F_4	VOCs	pH	ABNs	
BH1-24-SS4	2.29 – 2.90m Glacial Till (Native Material)	X	X	X		X	X		X	Assess APEC 1 (Medical Equipment Manufacturing)
BH3-24-SS5	3.05-3.66m Glacial Till (Native Material)	X	X	X		X	X	X	X	Assess APEC 1 (Medical Equipment Manufacturing)
BH5-24-SS2	0.76-1.37m Glacial Till (Native Material)	X			X	X		X		Characterization of soil within building footprint for excess soil purposes.
DUP 01[2]	3.05-3.66m Glacial Till (Native Material)	X	X	X		X	X		X	Duplicate soil sample for QA/QC purposes

Notes:
- 1 – including As, Sb and Se
- 2 – Duplicate of Sample BH3-24-SS5

Based on the guidelines outlined in the Sampling and Analysis Plan, appended to this report, the following groundwater samples were submitted for analysis:

Table 5 - Groundwater Samples Submitted for Analysis

Sample ID	Screened Interval/ Stratigraphic Unit	Parameter Analyzed						Rationale
		PHCs F_1-F_4	ABNs	VOCs	Metals	Hg	Cr^{IV}	
BH1-24-GW1	2.01-3.51m Glacial Till (Native Material)	X	X	X	X	X	X	Assess APEC 1 (Medical Equipment Manufacturing)
BH3-24-GW1	3.184.70m Glacial Till (Native Material)	X	X	X	X	X	X	Assess APEC 1 (Medical Equipment Manufacturing)
DUP-June25[1]	2.01-3.51m Glacial Till (Native Material)	X	X	X	X	X	X	Duplicate groundwater sample for QA/QC purposes

Notes:
- 1 – Duplicate of sample BH1-24-GW1

Paracel Laboratories (Paracel) of Ottawa, Ontario, performed the laboratory analysis on the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Laboratory

Accreditation (SCC/CALA). Paracel is accredited and certified by SCC/CALA for specific tests registered with the association.

4.8 Residue Management

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

4.9 Elevation Surveying

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

4.10 Quality Assurance and Quality Control Measures

A summary of quality assurance and quality control (QA/QC) measures, including sampling containers, preservation, labelling, handling, 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

Stratigraphy at the Phase II Property generally consists of the following:

- **Topsoil** was identified at ground surface at all borehole locations and extended to depths ranging from approximately 0.08 to 0.28 mbgs.
- **Silty Clay** generally consisting of brown silty clay was encountered in BH2-24 and BH3-24 beneath the surficial layer of topsoil and extended to depths ranging from approximately 0.61 to 1.45 mbgs.
- **Glacial till** generally consisting of brown silty sand to sandy silt with gravel, cobbles and boulders with trace clay was identified beneath the topsoil in BH1-24 and BH5-24, or beneath silty clay in BH2-24 and BH3-24. Glacial till extended to the end of each borehole with depths ranging from approximately 3.56 to 6.71mbgs. Groundwater is generated in this layer.
- Practical refusal was encountered in BH1-24 at a depth of 3.56mbgs. Bedrock depth was not determined on site.

The site stratigraphy is illustrated on the Cross Section Drawing, appended to this report.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling event on June 25, 2024, using an electronic water level meter. Groundwater levels are summarized below in Table 6. All ground surface elevations were acquired through a GPS survey completed at the time of the initial subsurface investigation.

Table 6 - Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (Asl)	Date of Measurement
BH1-24	94.20	0.28	93.92	June 25, 2024
BH2-24	93.69	0.05	93.64	June 25, 2024
BH3-24	93.85	0.10	93.75	June 25, 2024
BH5-24	93.92	0.18	93.74	June 25, 2024

5.3 Fine-Coarse Soil Texture

A grain size distribution analysis was not completed for the Phase II Property. As such, the more stringent coarse-grained soil standards were chosen for the purposes of this Phase II ESA.

5.4 Soil: Field Screening

Field screening of the soil samples collected resulted in vapour readings ranging 0.2 to 1.1 ppm. These results are not considered to be indicative of significant contamination from volatile contaminants. No visual or olfactory observations of potential contamination were noted at the time of sampling. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

5.5 Soil Quality

A total of 4 soil samples (including one duplicate) were submitted for analysis of BTEX, PHCs (F_1-F_4), VOCs, ABNs, metals (including Hg and CrVI) and/or pH.

The results of the soil analytical testing completed during the subsurface program are tabulated in Table 1A: Soil Analytical Test Results Compared to O.Reg. 153/04 Table 2 Commercial, Coarse Grained and Table 2A: Soil Analytical Test Results Compared to O.Reg. 406/19 Table 1 Agricultural, following the body of this report. The laboratory Certificates of Analysis are provided in Appendix 1.

Metals, Mercury and Hexavalent Chromium

All metal parameters concentrations detected in the soil samples analysed comply with the selected MECP Table 2 Standards. Metal parameters also complied with Table 1 Standards. Mercury and Hexavalent Chromium were not identified in any of the samples analysed. The analytical results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater appended to this report.

BTEX and PHCs (F_1-F_4)

No BTEX or PHC parameters were identified in the samples analysed. As such, the analytical results comply with the selected MECP Table 1 and Table 2 Standards. The results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater appended to this report.

VOCs

No VOC parameters were identified in the samples analysed. All results comply with the MECP Table 1 and 2 Standards. The analytical results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater appended to this report.

ABNs

No ABN parameters were identified in the samples analysed. All results comply with MECP Table 1 and 2 Standards. The analytical results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater appended to this report.

The maximum concentrations of analyzed parameters in the soil at the Phase II Property are summarized in Table 7.

TABLE 7 - Maximum Concentrations – Soil

Parameter	Maximum Concentration (µg/g)	Sample ID	Depth Interval (m BGS)
Arsenic	2.2	BH5-24-SS2	0.76 - 1.37; Native Material
Barium	58.3	BH1-24-SS4	2.29 – 2.90; Native Material
Boron	6.4	BH5-24-SS2	0.76 - 1.37; Native Material
Chromium	12.2	BH5-24-SS2	0.76 - 1.37; Native Material
Cobalt	5.3	BH5-24-SS2	0.76 - 1.37; Native Material
Copper	10.5	BH5-24-SS2	0.76 - 1.37; Native Material
Lead	3.6	BH5-24-SS2	0.76 - 1.37; Native Material
Nickel	8.8	BH5-24-SS2	0.76 - 1.37; Native Material
Vanadium	23.1	BH1-24-SS4	2.29 – 2.90; Native Material

All remaining parameter results were non-detect. The laboratory Certificates of Analysis are provided in Appendix 1.

All tested samples met the Table 1 standards. Based on the analytical results to date, if excess soil is generated during development, the soil can be transported to a reuse site able to accept soils meeting Table 1 standards.

5.6 Groundwater Quality

Three groundwater samples (including one duplicate) from monitoring wells installed in BH1-24 and BH3-24 were submitted for laboratory analysis of BTEX, VOCs, ABNs, Metals including Hg and CrIV, and/or PHCs (F_1-F_4).

The groundwater samples were obtained from the screened intervals noted in Table 2. The results of the analytical results are tabulated in Table 3A: Groundwater Analytical Test Results Compared to O.Reg. 153/04 Table 2 Potable Groundwater, coarse, following the body of this report. The laboratory Certificate of Analysis is provided in Appendix 1.

Metals, Mercury and Hexavalent Chromium

All metal parameters concentrations, including mercury and hexavalent chromium detected in the groundwater samples analysed comply with the selected MECP Table 2 Potable Groundwater Standards. Mercury and Hexavalent Chromium were not identified in any of the samples analysed. The analytical results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater appended to this report.

BTEX, PHCs, VOCs and ABNs

No parameter concentrations were identified in the groundwater samples analysed and therefore the results comply with the selected MECP Table 2 Standards. The analytical results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater appended to this report.

The maximum concentrations of analyzed parameters in the groundwater at the Phase II Property are summarized in Table 8.

TABLE 8 - Maximum Concentrations – Groundwater			
Parameter	**Maximum Concentration (µg/L)**	**Sample ID**	**Depth Interval (m BGS)**
Barium	197	BH1-24-GW1	2.01 – 3.51; Native Material
Boron	59	BH3-24-GW1	3.18 - 4.70; Native Material
Cobalt	0.8	BH3-24-GW1	3.18 - 4.70; Native Material
Copper	2.2	BH1-24-GW1	2.01 – 3.51; Native Material
Lead	0.1	BH1-24-GW1	2.01 – 3.51; Native Material
Molybdenum	6.3	DUP-June25 (BH1-24-GW1)	2.01 – 3.51; Native Material
Nickel	3	BH3-24-GW1	3.18 - 4.70; Native Material
Sodium	77,000	BH3-24-GW1	3.18 - 4.70; Native Material
Uranium	2.5	BH1-24-GW1	2.01 – 3.51; Native Material
Vanadium	0.8	BH3-24-GW1	3.18 - 4.70; Native Material

All remaining parameter results were non-detect. The laboratory Certificates of Analysis are provided in Appendix 1.

5.7 Quality Assurance and Quality Control Results

All soil and groundwater samples were handled in accordance with the Analytical Protocol with respect to holding time, preservation method, storage requirement, and container type.

As per Subsection 47(3) of O.Reg. 153/04 as amended, a Certificate of Analysis has been received for each sample submitted for analysis and all Certificates of Analysis are appended to this report.

As per the Sampling and Analysis Plan, a duplicate of soil Sample BH3-24-SS5 was submitted for laboratory analysis of metals, Hg, CrIV, BTEX, PHC, and VOC parameters. The duplicate was 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. Non-detect results were returned for the analysed parameters BTEX/PHC, VOC, Hg, CRIV, and ABNs. The RPD calculations for the identified parameters are provided in Table 9.

Table 9 - QA/QC Calculations – Soil					
Parameter	**MDL (µg/g)**	**BH3-24-SS5**	**DUP 01 (BH3-24-SS5)**	**RPD (%)**	**QA/QC Result**
Arsenic	1	1.9	1.9	0.0	Meets Target
Barium	1	52.1	49.6	4.9	Meets Target
Chromium	5	11.4	9.6	17.1	Meets Target
Cobalt	1	4.6	4.1	11.5	Meets Target
Copper	5	9.3	8.1	13.8	Meets Target
Lead	1	2.9	2.5	14.8	Meets Target
Nickel	5	7.4	6.2	17.6	Meets Target
Vanadium	10	22.2	20.3	8.9	Meets Target

The remaining parameter concentrations were not detected in either or both the original and/or duplicate, therefore, the RPD values cannot be calculated.

A duplicate groundwater sample was obtained from the monitoring well installed in BH1-24 and submitted for laboratory analysis of BTEX, PHCs, VOCs, Metals, Hg, CrIV, and ABN parameters. The RPD calculations for the detected concentrations in the groundwater samples are provided in Table 10.

Table 10 - QA/QC Calculations – Groundwater					
Parameter	**MDL (µg/L)**	**BH1-24-GW1**	**DUP-June25 (BH1-24-GW1)**	**RPD (%)**	**QA/QC Result**
Barium	1	197	175	11.8	Meets Target
Boron	10	26	26	0.0	Meets Target
Copper	0.5	2.2	0.8	93.3	Does Not Meet Target
Molybdenum	0.5	5.4	6.3	15.4	Meets Target
Sodium	200	22200	23400	5.3	Meets Target
Uranium	0.1	2.5	2.3	8.3	Meets Target
Vanadium	0.5	0.7	0.7	0.0	Meets Target

The remaining parameter concentrations were not detected in either or both the original and/or duplicate, therefore, the RPD values cannot be calculated.

Typically, RPD values below 20% are considered to be of satisfactory quality. The relative percent difference (RPD) results calculated for one groundwater parameter 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 value calculated between the original and duplicate sample, it should be noted that the concentrations of the parameter were well within the selected MECP Table 2 Standards 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 Phase II-

ESA is considered to be sufficient to meet the overall objectives of this assessment.

5.8 Phase II Conceptual Site Model

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

Site Description

The Phase II Property addressed 5923 Ottawa Street is located on the north side of Ottawa Street approximately 150m west of Eagleson Road, in the City of Ottawa (Richmond), Ontario. The legal description for the Phase II Property is PCL 10-4, SEC 4D-26; PT UNIT 10, PL 4D-26, PT 4, 4R7050; GOULBOURN.

The Phase II Property is an irregular shaped parcel of land, with an approximate area of 2.27 hectares. At the time of the 2024 Phase I-ESA, the Phase II Property existed as vacant land with a forested section covering the northern two thirds of the property.

The Phase II Property is currently not serviced; municipal services will be provided to the Phase II Property upon development. Residential and commercial properties within the 250m study area are not serviced with municipal water.

Based on the municipal and geological setting and the proposed commercial development, the MECP Table 2 Residential Standards are applicable to the Phase II Property. The more conservative coarse-grained soil standards were chosen to the represent the site conditions.

Background

One off-site PCA, the manufacturing facility west of the Phase I Property, was considered to result in an area of potential environmental concern (APEC) on the Phase I Property. This PCA has the potential for contaminants to have infiltrated the soil and/or groundwater on the section of the Phase I Property that is adjacent to the manufacturing building on 5935 Ottawa Street.

Contaminants of potential concern associated with the Manufacturing of Medical and Measurement devices include VOCs, BTEX, PHCs (F_1-F_4), Metals, Mercury, Hexavalent Chromium, and ABNs.

Potentially Contaminating Activity and Areas of Potential Environmental Concern

Based on the findings of the Phase-1 and Phase-II ESAs completed for the Phase II Property, historical and/or existing on-site and off-site potentially contaminating activities (PCAs) were considered to result in one (1) area of potential environmental concern (APEC) on the Phase II Property.

The PCAs resulting in APECs on the Phase II Property are presented in the table below and are depicted on Drawing: PE6526-1 – Site Plan.

Table 11: Table of Areas of Potential Environmental Concern 5923 Ottawa Street, Ottawa

Area of potential environmental concern	Location of area of potential environmental concern on Phase I Property	Potentially contaminating activity	Location of PCA (onsite or off-site)	Contaminants of potential concern	Media potentially impacted (Ground water, soil and/or sediment)
APEC 1 (Manufacturing of Medical, Measurement, and Controlling Devices)	Southwest portion of the Phase I Property (5923 Ottawa Street)	Item Other – Manufacturing of Medical, Measurement, and Controlling Devices.	Off-site	BTEX, VOCs, PHCs, Metals, Hg, CrVI, ABNs	Soil and Groundwater

APEC 1 – Manufacturing of Medical, Measuring and Controlling Devices – PCA 1 on Drawing PE6526-1, Item Other "Manufacturing of Medical, Measuring and Controlling Devices"

The Phase I ESA identified former manufacturing activities (Quatrosense Environmental Ltd.) as noted in the Phase I Interview adjacent to the Phase II Property at 5935 Ottawa Street, identified as APEC 1.

The commercial manufacturer of medical, measurement and controlling devices can be seen on the adjacent property to the west of the Phase II Property in the 1991, 2002, 2011, and 2022 aerial photographs.

The historical presence of the off-site manufacturing of medical, measuring and controlling devices is considered to be a potentially contaminating activity (PCA 1; Item N/A), resulting in an APEC on the Phase II Property, as depicted on Drawing PE6526-1 – Site Plan.

Potential contaminants of concern (CPCs) associated with this APEC include volatile organic compounds (VOCs), Benzene, Toluene, Ethylbenzene, Xylene

(BTEX), Petroleum Hydrocarbons Fractions 1 through 4 (PHCs F1-F4), Metals, Mercury (Hg), Hexavalent Chromium (Cr^{IV}), and Acid/Base/Neutral Compounds (ABNs), in soil and groundwater.

Additional PCAs Identified Within the Phase I Study Area

PCA 2 on Drawing PE6526-2 – Surrounding Land Use Plan - Table 2, O.Reg. 153/04, Item 28: "Gasoline and Associated Products Storage in Fixed Tanks,"– this PCA was selected based on a historical furnace oil spill at 5949 Ottawa Street, approximately 70m west of the Phase II Property.

PCA 3 on Drawing PE6526-2 – Surrounding Land Use Plan - Table 2, O.Reg. 153/04, Item 10: "Commercial Autobody Shop,"– this PCA was selected based on the presence of an existing body shop/paint booth at 5949 Ottawa Street approximately 50 m west of the Phase II Property.

PCA 4 on Drawing PE6526-2 – Surrounding Land Use Plan - Table 2, O.Reg. 153/04, Item 52: "Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems,"– this PCA was selected based on the presence of an existing automotive service garage located at 5949 Ottawa Street, approximately 50 m west of the Phase II Property.

PCA 5 on Drawing PE6526-2 – Surrounding Land Use Plan - Table 2, O.Reg. 153/04, Item 46: "Rail Yards Tracks and Spurs,"– this PCA was selected based on the presence of the existing Smiths Falls Rail Corridor located north of the Phase II Property.

PCA 6 on Drawing PE6526-2 – Surrounding Land Use Plan - Table 2, O.Reg. 153/04, Item 40: "Pesticides (Including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications"– this PCA was selected based on the presence of an existing commercial nursery at 5901 Ottawa Street east of the Phase II Property.

These PCAs identified within the Phase I Study Area were not considered to represent APECs on the Phase II Property based on separation distance, orientation relative to groundwater flow direction, nature of the activity, low mobility of associated contaminants of potential concern (CPCs) and/or the low permeability/hydraulic conductivity of the underlying silty clay soils. These PCAs are shown on Drawing PE6526-2 – Surrounding Land Use Plan.

Contaminants of Potential Concern

The following Contaminants of Potential Concern (CPCs) were identified with respect to the soil and groundwater on the Phase II Property:

- ❒ Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)
- ❒ Volatile Organic Compounds (VOCs)
- ❒ Petroleum Hydrocarbons fractions 1 through 4 (PHCs F_1-F_4)
- ❒ Metals, including arsenic (As), antimony (Sb), and selenium (Se)
- ❒ Mercury (Hg)
- ❒ Hexavalent Chromium (CrVI)
- ❒ Acid/Base/Neutral Compounds (ABNs)

Subsurface Structures

No subsurface structures were present on the Phase II Property at the time of the Phase II ESA.

Underground Utilities

The site was not serviced at the time of the Phase I site visits or Phase II-ESA field program.

Physical Setting

The Phase II Property is a vacant parcel of land situated on the north side of Ottawa Street, west of Eagleson Road, in the City of Ottawa, Ontario, within an area comprised of residential, agricultural, commercial and industrial land uses.

The general area of the Phase II Property slopes down towards the north. Surrounding properties are provided with private water and sewer services. Site drainage consists primarily of infiltration with some sheet drainage to the Ottawa Street roadside ditch.

Site Stratigraphy

Stratigraphy at the Phase II Property generally consists of the following:

- ❒ **Topsoil** was identified at ground surface at all borehole locations and extended to depths ranging from approximately 0.08 to 0.28 mbgs.

- ❒ **Silty Clay** generally consisting of brown silty clay was encountered in BH2-24 and BH3-24 beneath the surficial layer of topsoil and extended to depths ranging from approximately 0.61 to 1.45 mbgs.

- **Glacial till** generally consisting of brown silty sand to sandy silt with gravel, cobbles and boulders with trace clay was identified beneath the topsoil in BH1-24 and BH5-24, or beneath silty clay in BH2-24 and BH3-24. Glacial till extended to the end of each borehole with depths ranging from approximately 3.56 to 6.71 mbgs. Groundwater is generated in this layer.

- Practical refusal was encountered in BH1-24 at a depth of 3.56mbgs. Bedrock depth was not determined on site.

The site stratigraphy is illustrated on the Cross Section Drawings, appended to this report.

Hydrogeological Characteristics

Groundwater levels were measured at the Phase II Property during the June 2024 groundwater sampling event.

The measured groundwater levels ranged from approximately 0.05 to 0.28m below existing grade. It is noted that groundwater elevations fluctuate seasonally.

Based on the groundwater levels recorded during the June 2024 monitoring event, groundwater contour mapping was completed. Based on the contour mapping, groundwater flow at the Phase II Property is interpreted to flow in a northeasterly direction. A horizontal hydraulic gradient of 0.003m/m was calculated. Groundwater contours are presented on Drawing PE6526-3 – Test Hole Location Plan.

Free product was not observed in any of the monitoring wells during the sampling event conducted at the Phase II Property.

Approximate Depth to Bedrock

Based on available mapping, bedrock in the area of the Phase II Property is reported to consist of dolostone of the Oxford Formation at depths ranging from 3 to 15m over the Phase II Property.

Bedrock was not confirmed during this Phase II-ESA.

Approximate Depth to Water Table

Based on the June groundwater sampling event the depth to the water table at the Phase II Property varies between approximately 0.05 to 0.28m below existing grade. However, it is expected that the long-term water table in each monitoring well lies within the layer of glacial till.

Section 35 of the Regulation: Non-Potable Groundwater

Section 35 of the Regulation does not apply to the Phase II Property as follows:

- ❒ The Phase II Property, and other properties located in whole or in part, within 250 metres of the boundaries of the Phase II Property, are not supplied by a municipal drinking water system, as defined in the Safe Drinking Water Act, 2002.
- ❒ The Phase II Property is an agricultural or other use.
- ❒ Properties in the Phase I Study Area have a well used or intended for use as a source of water for human consumption or agriculture.

Section 41 of Ontario Regulation 153/04: Environmentally Sensitive Areas

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the Phase II Property, in that the Phase II Property is not within 30m of an environmentally sensitive area and the pH of the surface soil sample BH5-24-SS2 is 7.45 (between 5 and 9) and the pH of the subsurface soil sample BH3-24-SS5 is 7.37 (between 5 and 11).

Section 43.1 of Ontario Regulation 153/04: Shallow Soil Property or Water Body

Section 43.1 of the Regulation does not apply to the Phase II Property as bedrock is not located less than 2m below ground surface and there are no water bodies located on or within 30m of the Phase II Property.

Existing Buildings and Structures

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

Based on the findings of the Phase I Environmental Site Assessment, the Phase II Property has never been formally developed and no former buildings have ever existed on the site. Based on the available information obtained as part of the Phase I ESA, no APECs were identified with respect to potential former buildings or structures on the Phase II Property.

Proposed Buildings and Other Structures

It is our understanding that a commercial business will be constructed on the Phase II Property. The proposed building will generally be surrounded by landscaped areas and associated asphalt-paved parking areas. It is expected that the proposed development will be privately serviced.

Areas On, In or Under the Phase II Property Where Excess Soil is Finally Placed

There are no areas on, in or under the Phase II Property where excess soil is finally placed.

Environmental Condition

Areas Where Contaminants are Present

Based on the findings of the Phase II-ESA, soil and groundwater results comply with the MECP Table 2 agricultural standards. Soil samples were also found to comply with Table 1 standards. No contaminants are present on the Phase II Property.

Soil and groundwater results are presented on Drawing PE6526-4 – Analytical Testing Plan – Soil and Groundwater.

Types of Contaminants

Based on the findings of the Phase II-ESA, there are no contaminants of concern present on the Phase II Property.

Contaminated Media

Based on the findings of the Phase II-ESA, there is no contaminated media present on the Phase II Property.

What Is Known About Areas Where Contaminants Are Present

Based on the findings of the Phase II-ESA, there are no contaminants present on the Phase II Property.

Distribution of Contaminants

Based on the findings of the current Phase II-ESA, soil and groundwater at the Phase II Property comply with the MECP Table 2 standards and soil complied with Table 1 standards for excess soils.

Migration of Contaminants

Based on the findings of the Phase II-ESA, contaminants are not present on the Phase II Property and as such, no migration of contaminants has occurred.

Discharge of Contaminants

Based on the findings of the Phase II-ESA, discharge of contaminants is not considered to have occurred on the Phase II Property.

Climatic and Meteorological Conditions

Given that there are no contaminants currently present on the Phase II Property, climatic and meteorological conditions are not considered to have affected contaminant distribution at the Phase II Property.

Potential for Vapour Intrusion

Based on the findings of the 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 5923 Ottawa Street, in the City of Ottawa, Ontario. The purpose of the Phase II-ESA was to address one potentially contaminating activity (PCA) that was identified during the Phase I-ESA and was considered to result in an area of potential environmental concern (APEC) on the Phase II Property.

The Phase II-ESA was carried out in conjunction with Geotechnical and Hydrogeological Investigations and consisted of drilling 5 boreholes at the Phase II Property, 4 of which were instrumented with groundwater monitoring wells. Boreholes were placed to address the previously identified APEC and to provide coverage for Geotechnical and Hydrogeological purposes.

Soil samples obtained from the boreholes were screened using visual and olfactory observations as well as organic vapour measurements. A total of 4 soil samples (including one duplicate) were submitted for analysis of metals (including As, Sb, Se), mercury (Hg), hexavalent chromium (CrVI), benzene, toluene, ethylbenzene, xylenes (BTEX), petroleum hydrocarbons (PHCs, F_1-F_4), volatile organic compounds (VOCs), acid base neutrals (ABNs), and/or pH.

Metal parameter concentrations identified in the soil samples analysed comply with the MECP Table 2 Standards as well as MECP Table 1 Standards. Remaining parameters analysed (BTEX, PHCs, VOCs, ABNs, Hg and CrVI) were not identified in the soil samples.

Three groundwater samples (including one duplicate) from monitoring wells installed in BH1-24 and BH3-24 were submitted for laboratory analysis of BTEX, VOCs, Metals, ABNs and/or PHCs (F_1-F_4). No sheen, free product or odour was noted during the groundwater sampling events. Apart from metals, no parameter concentrations were identified in the groundwater samples analysed. Metal concentrations identified were in compliance with the selected MECP Table 2 Standards.

Based on the analytical test results, the soil and groundwater beneath the Phase II Property complies with the selected MECP Table 2 Standards. As such, it is our opinion that no further investigative work is required at this time.

6.1 RECOMMENDATIONS

Monitoring Wells

It is recommended that the monitoring wells installed on the Phase II Property remain viable for future monitoring, if required. It is expected that groundwater monitoring wells will be abandoned in accordance with O.Reg.903 at the time of the construction excavation. Further information can be provided upon request in this regard.

O.Reg. 406/19: On-Site and Excess Soil Management

Excess soil that may be generated as part of the development of the Phase II Property must be handled in accordance with O.Reg. 406/19.

7.0 STATEMENT OF LIMITATIONS

This Phase II - Environmental Site Assessment report has been prepared in general accordance with O.Reg. 153/04 as amended and meets the requirements of CSA Z769-00 (reaffirmed 2022) 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 Stratford-Fox Run. Notification from Stratford-Fox Run and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Mark Bujaki, B.Sc., MBA

Karyn Munch, P.Eng., QP_{ESA}

Report Distribution:

- Stratford-Fox Run
- Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE6526-1 – SITE PLAN

DRAWING PE6526-2 – SURROUNDING LAND USE PLAN

DRAWING PE6526-3 – TEST HOLE LOCATION PLAN

DRAWING PE6526-4 ANAYTICAL TESTING PLAN – SOIL AND GROUNDWATER

DRAWING PE6526-4A – CROSS SECTION A-A'

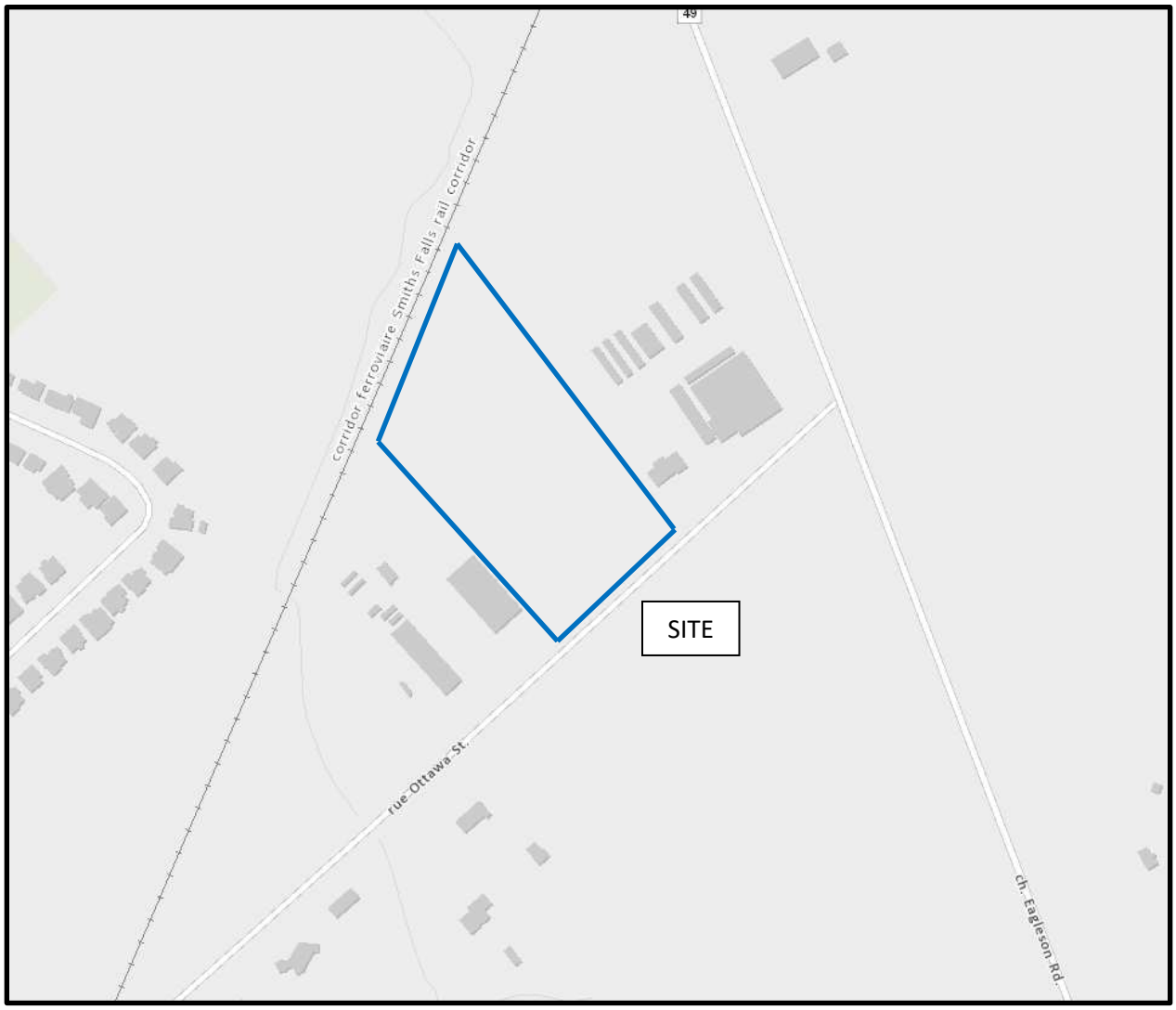
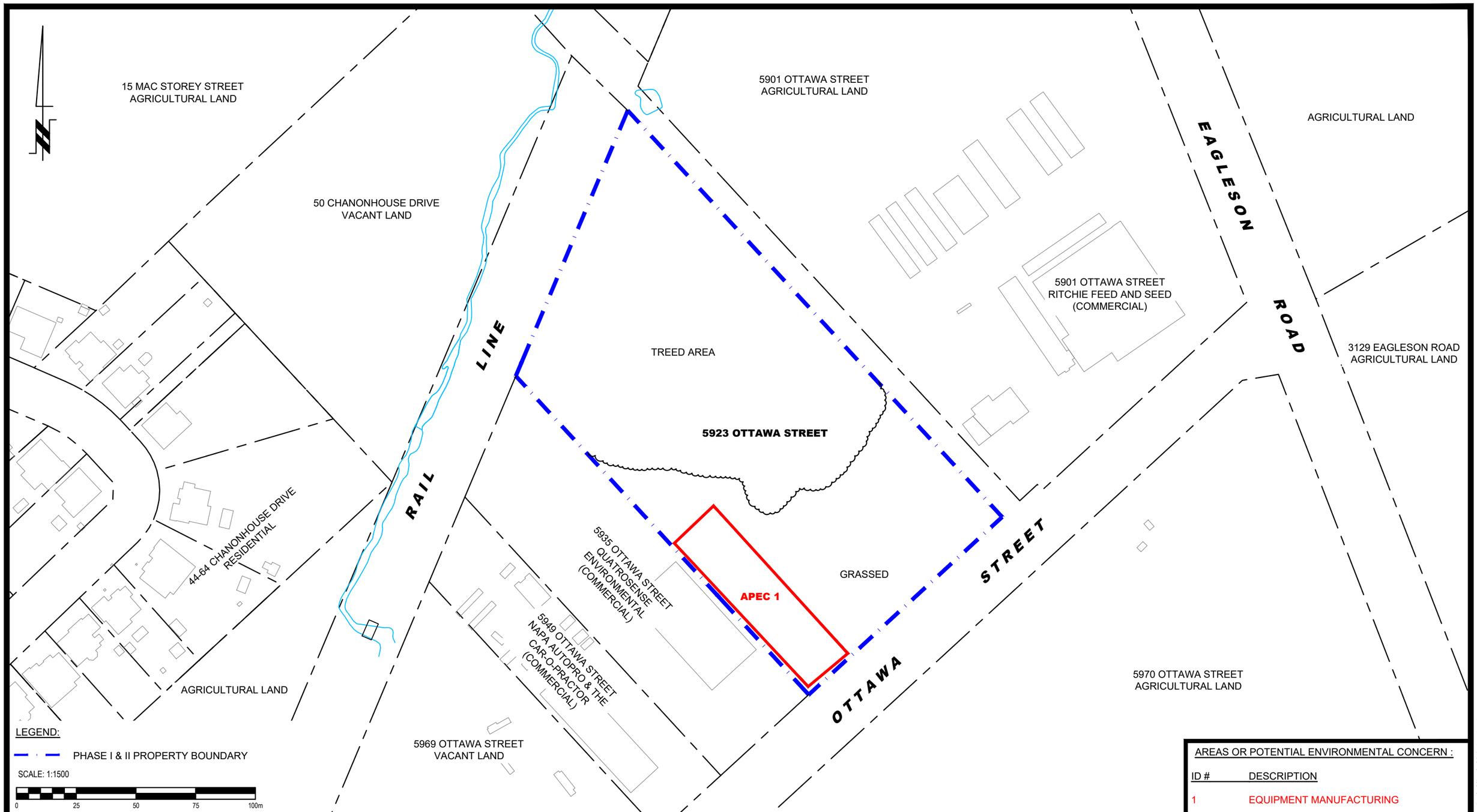


FIGURE 1

KEY PLAN



LEGEND:

PHASE I & II PROPERTY BOUNDARY

SCALE: 1:1500

0 25 50 75 100m

AREAS OR POTENTIAL ENVIRONMENTAL CONCERN :

ID #	DESCRIPTION
1	EQUIPMENT MANUFACTURING

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

NO.	REVISIONS	DATE	INITIAL

INVERNESS HOMES

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
5923 OTTAWA STREET

RICHMOND, ONTARIO

Title: **SITE PLAN**

Scale: 1:1500	Date: 04/2024
Drawn by: CT	Report No.: PE6526-1
Checked by: MB	Dwg. No.: PE6526-1
Approved by: MB	Revision No.:

11x17

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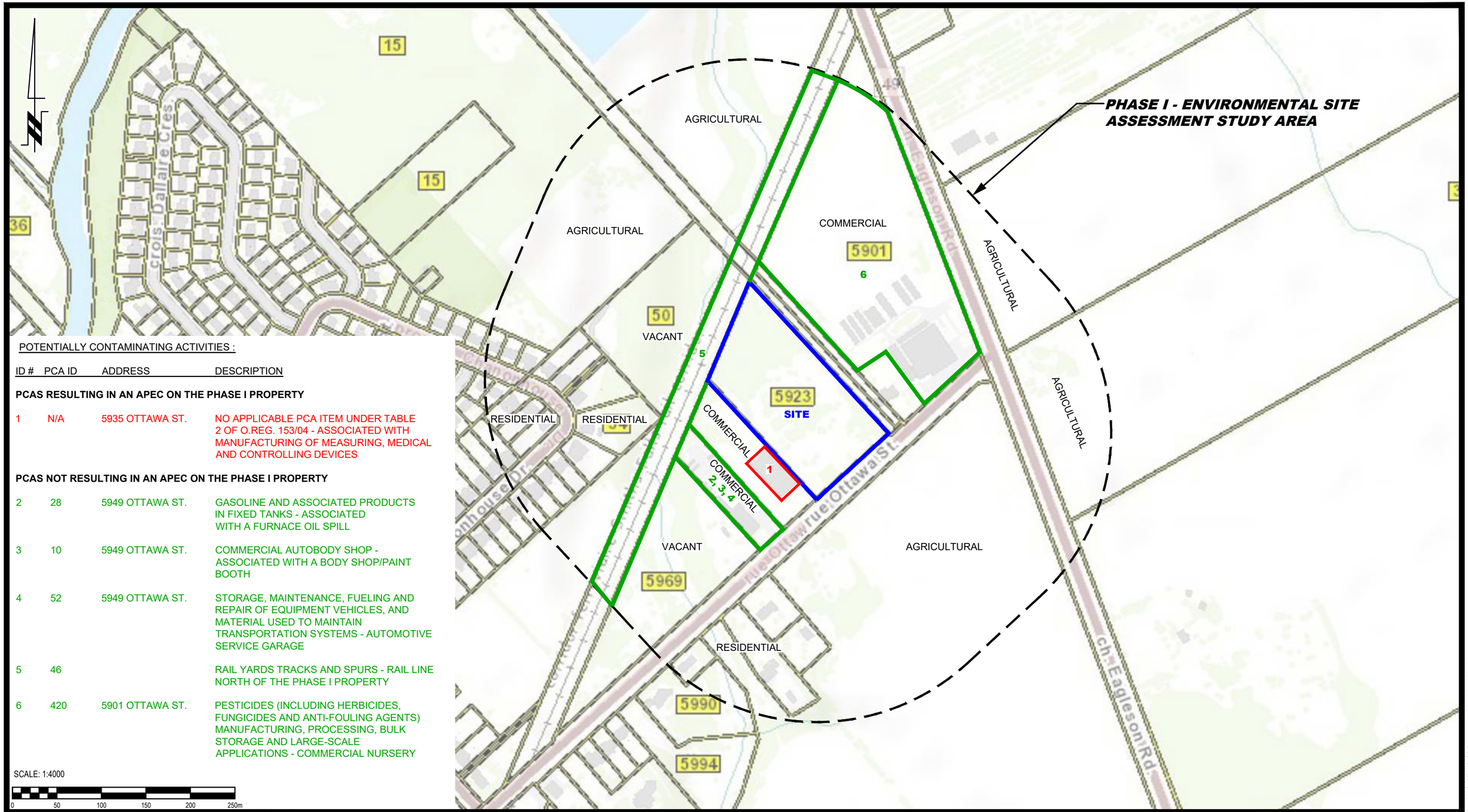

POTENTIALLY CONTAMINATING ACTIVITIES :

ID #	PCA ID	ADDRESS	DESCRIPTION
PCAS RESULTING IN AN APEC ON THE PHASE I PROPERTY			
1	N/A	5935 OTTAWA ST.	NO APPLICABLE PCA ITEM UNDER TABLE 2 OF O.REG. 153/04 - ASSOCIATED WITH MANUFACTURING OF MEASURING, MEDICAL AND CONTROLLING DEVICES
PCAS NOT RESULTING IN AN APEC ON THE PHASE I PROPERTY			
2	28	5949 OTTAWA ST.	GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS - ASSOCIATED WITH A FURNACE OIL SPILL
3	10	5949 OTTAWA ST.	COMMERCIAL AUTOBODY SHOP - ASSOCIATED WITH A BODY SHOP/PAINT BOOTH
4	52	5949 OTTAWA ST.	STORAGE, MAINTENANCE, FUELING AND REPAIR OF EQUIPMENT VEHICLES, AND MATERIAL USED TO MAINTAIN TRANSPORTATION SYSTEMS - AUTOMOTIVE SERVICE GARAGE
5	46		RAIL YARDS TRACKS AND SPURS - RAIL LINE NORTH OF THE PHASE I PROPERTY
6	420	5901 OTTAWA ST.	PESTICIDES (INCLUDING HERBICIDES, FUNGICIDES AND ANTI-FOULING AGENTS) MANUFACTURING, PROCESSING, BULK STORAGE AND LARGE-SCALE APPLICATIONS - COMMERCIAL NURSERY

SCALE: 1:4000

0 50 100 150 200 250m

PATERSON GROUP
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NO.	REVISIONS	DATE	INITIAL

INVERNESS HOMES

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
5923 OTTAWA STREET

RICHMOND, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:4000	Date: 07/2024
Drawn by: GK	Report No.: PE6526-REP.01
Checked by: MB	Dwg. No.: PE6526-2
Approved by: KM	Revision No.:

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11x17

3760 EAGLESON ROAD
VACANT LAND

5901 OTTAWA STREET
AGRICULTURAL LAND

5901 OTTAWA STREET
RITCHIE FEED AND SEED
(COMMERCIAL)

FUTURE ROAD ALLOWANCE

O T T A W A

STREET

5970 OTTAWA STREET
AGRICULTURAL LAND

15 MAC STOREY STREET
AGRICULTURAL LAND

50 CHANONHOUSE DRIVE
VACANT LAND

RAIL LINE

TREED AREA

GRASSED

5923 OTTAWA STREET

BH 2-24
93.69
(93.64)

BH 5-24
93.92
(93.74)

BH 4-24
94.11
(93.66)

BH 1-24
94.20
(93.92)

BH 3-24
93.85
(93.75)

(0.003m/m)

5935 OTTAWA STREET
QUATROSENSE
ENVIRONMENTAL
(COMMERCIAL)

5949 OTTAWA STREET
NAPA AUTOPRO & THE
CAR-O-PRACTOR
(COMMERCIAL)

LEGEND:

- PHASE I & II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 94.20 GROUND SURFACE ELEVATION (m)
- (93.92) GROUNDWATER SURFACE ELEVATION (m) (JUNE 25, 2024)
- 93.8 GROUNDWATER CONTOURS (m)
- (0.003m/m) APPROX. GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

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

SCALE: 1:1250

0 5 10 15 20 25 50 75m

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STRATFORD-FOX RUN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5923 OTTAWA STREET

RICHMOND, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1250	Date: 07/2024
Drawn by: GK	Report No.: PE6526-2
Checked by: MB	Dwg. No.: PE6526-3
Approved by: KM	Revision No.:

11x17

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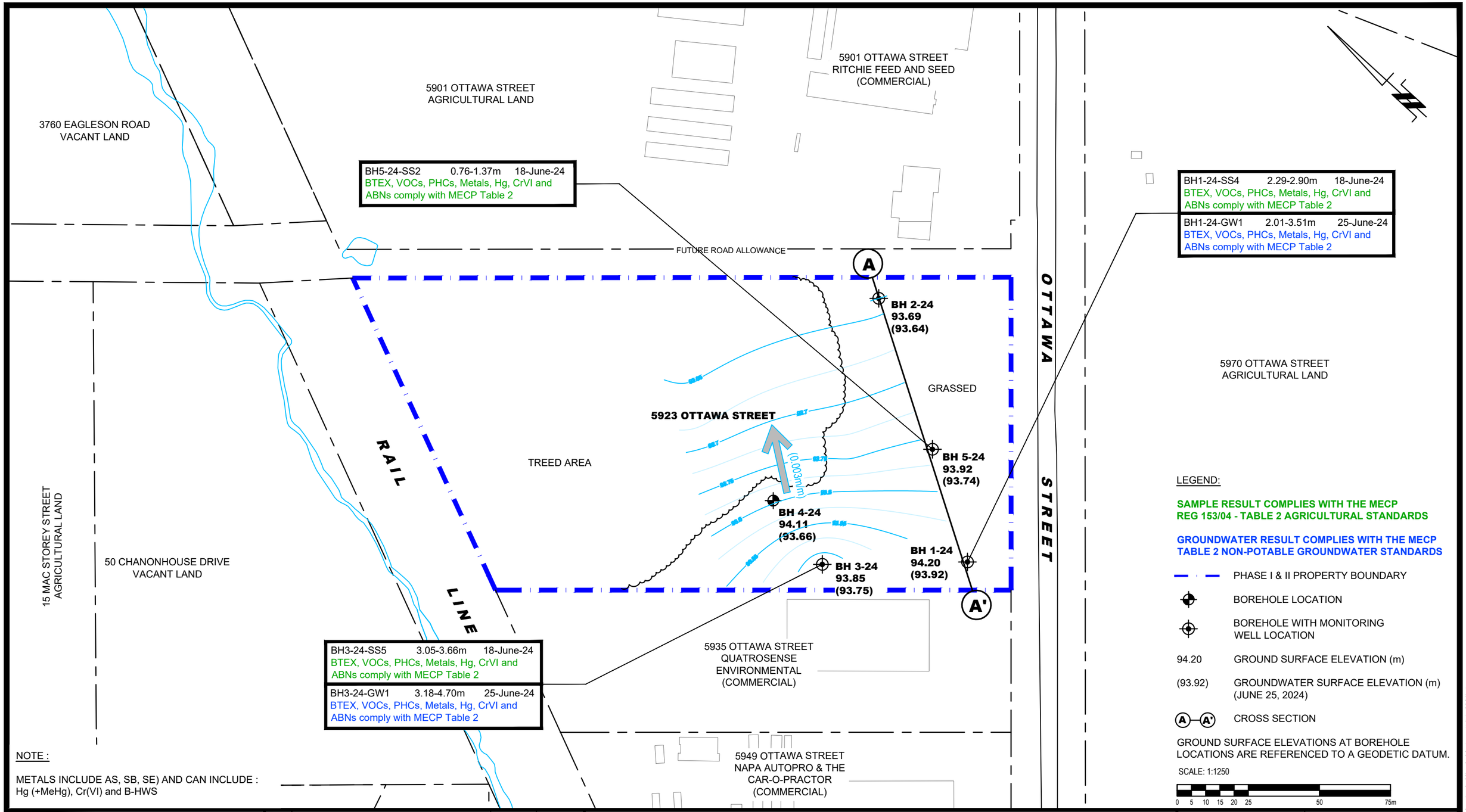

NOTE :

METALS INCLUDE AS, SB, SE) AND CAN INCLUDE :
Hg (+MeHg), Cr(VI) and B-HWS

LEGEND:

SAMPLE RESULT COMPLIES WITH THE MECP
REG 153/04 - TABLE 2 AGRICULTURAL STANDARDS

GROUNDWATER RESULT COMPLIES WITH THE MECP
TABLE 2 NON-POTABLE GROUNDWATER STANDARDS

- PHASE I & II PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 94.20 GROUND SURFACE ELEVATION (m)
- (93.92) GROUNDWATER SURFACE ELEVATION (m) (JUNE 25, 2024)
- A—A' CROSS SECTION

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

SCALE: 1:1250

0 5 10 15 20 25 50 75m

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NO.	REVISIONS	DATE	INITIAL

STRATFORD-FOX RUN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5923 OTTAWA STREET

RICHMOND, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL AND GROUNDWATER

Scale: 1:1250	Date: 07/2024
Drawn by: GK	Report No.: PE6526-2
Checked by: MB	Dwg. No.: PE6526-4
Approved by: KM	Revision No.:

11x17

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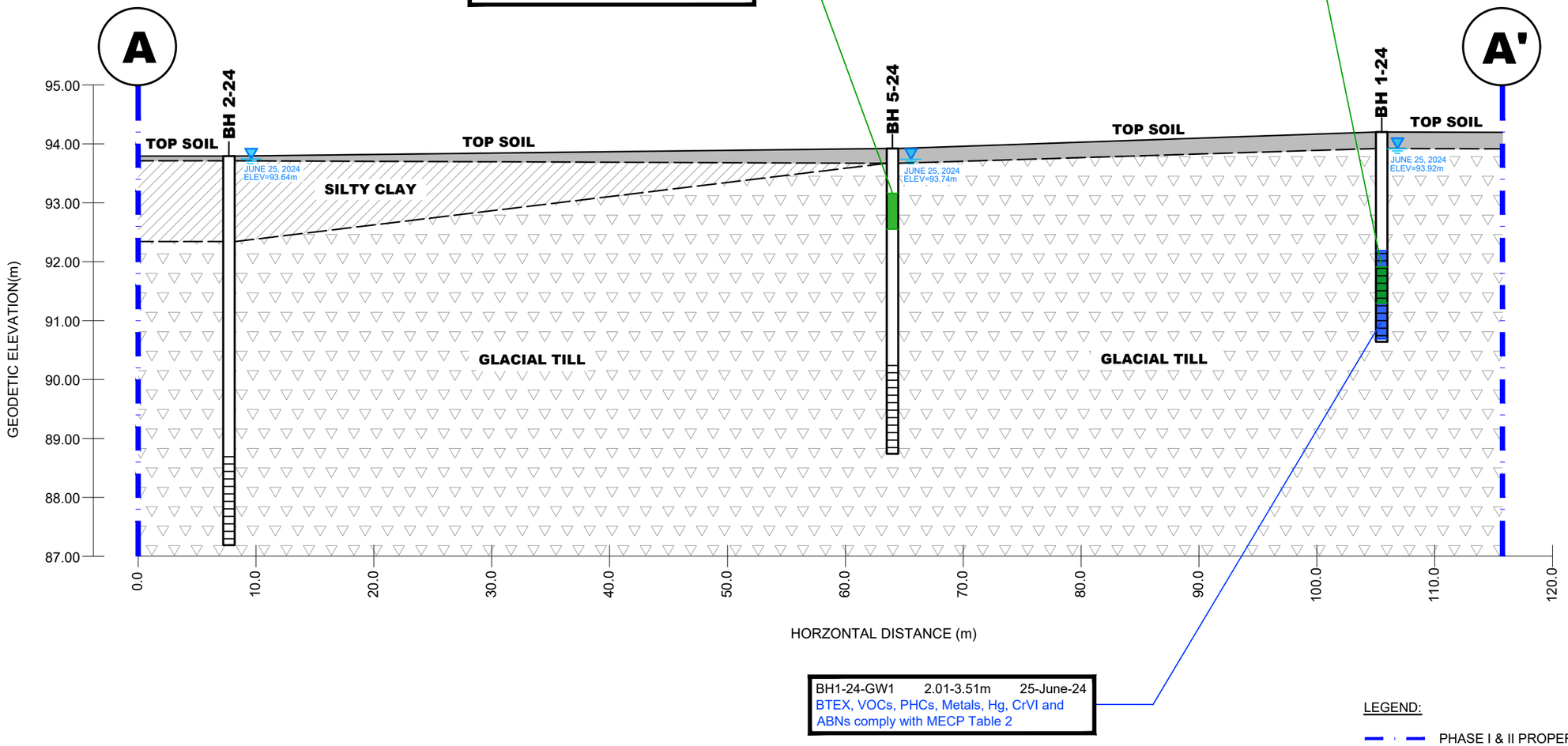

LEGEND:

PHASE I & II PROPERTY BOUNDARY

SAMPLE RESULT COMPLIES WITH THE MECP
REG 153/04 - TABLE 2 AGRICULTURAL STANDARDS

GROUNDWATER RESULT COMPLIES WITH THE MECP
TABLE 2 NON-POTABLE GROUNDWATER STANDARDS

NOTE :

METALS INCLUDE AS, SB, SE) AND CAN INCLUDE :
Hg (+MeHg), Cr(VI) and B-HWS

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NO.	REVISIONS	DATE	INITIAL

STRATFORD-FOX RUN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5923 OTTAWA STREET

RICHMOND, ONTARIO

Title:

CROSS-SECTION A-A'- SOIL AND GROUNDWATER

Scale: AS SHOWN	Date: 08/2024
Drawn by: GK	Report No.: PE6526-2
Checked by: MB	Dwg. No.: PE6526-4A
Approved by: KM	Revision No.:

11x17

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TABLES

TABLE 1A – SOIL ANALYTICAL TEST RESULTS COMPARED TO O.REG. 153/04 TABLE 2 COMMERCIAL, COARSE GRAINED

TABLE 2A – SOIL ANALYTICAL TEST RESULTS COMPARED TO O.REG. 406/19 TABLE 1 AGRICULTURAL

TABLE 3A – GROUNDWATER ANALYTICAL TEST RESULTS COMPARED TO O.REG. 153/04 TABLE 2 POTABLE GROUNDWATER, COARSE GRAINED

Parameter	Units	MDL	Regulation	Sample PE6526			
				BH1-24-SS4 2425459-01	BH3-24-SS5 2425459-03	BH5-24-SS2 2425459-04	DUP 01 2425459-05
Sample Depth (m)			Reg 153/04-Table 2 Commercial	2.29 - 2.90	3.05 - 3.66	0.76 - 1.37	3.05 - 3.66
Sample Date			coarse	18-Jun-2024	18-Jun-2024	18-Jun-2024	18-Jun-2024
Phsical Characteristics							
% Solids	% by Wt.	0.1		91.6	86.9	90.6	87.5
General Inorganics							
pH	pH Units	0.05	NV	N/A	7.37	7.45	N/A
Metals							
Antimony	ug/g dry	0.05	40	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Arsenic	ug/g dry	1.0	18	1.9	1.9	2.2	1.9
Barium	ug/g dry	1.0	670	58.3	52.1	39.7	49.6
Beryllium	ug/g dry	0.5	8.0	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Boron	ug/g dry	0.5	120	ND (5.0)	ND (5.0)	6.4	ND (5.0)
Cadmium	ug/g dry	0.5	1.9	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chromium (VI)	ug/g dry	0.2	8.0	ND (0.2)	ND (0.2)	N/A	ND (0.2)
Chromium	ug/g dry	5	160	11.9	11.4	12.2	9.6
Cobalt	ug/g dry	1	80	4.8	4.6	5.3	4.1
Copper	ug/g dry	5	230	9.7	9.3	10.5	8.1
Lead	ug/g dry	1	120	3.5	2.9	3.6	2.5
Mercury	ug/g dry	0.1	3.9	ND (0.1)	ND (0.1)	N/A	ND (0.1)
Molybdenum	ug/g dry	1	40	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Nickel	ug/g dry	5	270	7.9	7.4	8.8	6.2
Selenium	ug/g dry	1	5.5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Silver	ug/g dry	0.3	40	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Thallium	ug/g dry	1	3.3	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	ug/g dry	5	33	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vanadium	ug/g dry	1	86	23.1	22.2	22.6	20.3
Zinc	ug/g dry	10	340	ND (20.0)	ND (20.0)	ND (20.0)	ND (20.0)
Volatiles							
Acetone	ug/g dry	0.50	16	ND (0.50)	ND (0.50)	N/A	ND (0.50)
Benzene	ug/g dry	0.02	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	ug/g dry	0.05	1.5	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Bromoform	ug/g dry	0.05	0.61	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Bromomethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Carbon Tetrachloride	ug/g dry	0.05	0.21	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Chlorobenzene	ug/g dry	0.05	2.4	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Chloroform	ug/g dry	0.05	0.47	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Dibromochloromethane	ug/g dry	0.05	2.3	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Dichlorodifluoromethane	ug/g dry	0.20	16	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,2-Dichlorobenzene	ug/g dry	0.05	1.2	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,3-Dichlorobenzene	ug/g dry	0.05	9.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,4-Dichlorobenzene	ug/g dry	0.05	0.2	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1-Dichloroethane	ug/g dry	0.05	0.47	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,2-Dichloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1-Dichloroethylene	ug/g dry	0.05	0.064	ND (0.05)	ND (0.05)	N/A	ND (0.05)
cis-1,2-Dichloroethylene	ug/g dry	0.05	1.9	ND (0.05)	ND (0.05)	N/A	ND (0.05)
trans-1,2-Dichloroethylene	ug/g dry	0.05	1.3	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,2-Dichloropropane	ug/g dry	0.05	0.16	ND (0.05)	ND (0.05)	N/A	ND (0.05)
cis-1,3-Dichloropropylene	ug/g dry	0.05	0.059	ND (0.05)	ND (0.05)	N/A	ND (0.05)
trans-1,3-Dichloropropylene	ug/g dry	0.05	0.059	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,3-Dichloropropene, total	ug/g dry	0.05	0.059	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Ethylbenzene	ug/g dry	0.05	1.1	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane,	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Hexane	ug/g dry	0.05	46	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.05	70	ND (0.50)	ND (0.50)	N/A	ND (0.50)
Methyl Isobutyl Ketone	ug/g dry	0.05	31	ND (0.50)	ND (0.50)	N/A	ND (0.50)
Methyl tert-butyl ether	ug/g dry	0.05	1.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Methylene Chloride	ug/g dry	0.50	1.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Styrene	ug/g dry	2.00	34	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1,1,2-Tetrachloroethane	ug/g dry	0.50	0.087	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Tetrachloroethylene	ug/g dry	0.05	1.9	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Toluene	ug/g dry	0.05	6.4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	ug/g dry	0.05	6.1	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1,2-Trichloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Trichloroethylene	ug/g dry	0.05	0.55	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Trichlorofluoromethane	ug/g dry	0.05	4.0	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Vinyl Chloride	ug/g dry	0.05	0.032	ND (0.02)	ND (0.02)	N/A	ND (0.02)
m/p-Xylene	ug/g dry	0.05	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	ug/g dry	0.05	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	ug/g dry	0.05	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hydrocarbons							
F1 PHCs (C6-C10)	ug/g dry	7	55	ND (7)	ND (7)	ND (7)	ND (7)
F2 PHCs (C10-C16)	ug/g dry	4	230	ND (4)	ND (4)	ND (4)	ND (4)
F3 PHCs (C16-C34)	ug/g dry	8	1700	ND (8)	ND (8)	ND (8)	ND (8)
F4 PHCs (C34-C50)	ug/g dry	6	3300	ND (6)	ND (6)	ND (6)	ND (6)
Semi-Volatiles							
1,2,4-Trichlorobenzene	ug/g dry	0.05	3.2	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1-Methylnaphthalene	ug/g dry	0.05	30	ND (0.05)	ND (0.05)	N/A	ND (0.05)
2-Methylnaphthalene	ug/g dry	0.05	30	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Methylnaphthalene (1&2)	ug/g dry	0.05	30	ND (0.05)	ND (0.05)	N/A	ND (0.05)
2,4-Dinitrotoluene	ug/g dry	0.10	NV	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,6-Dinitrotoluene	ug/g dry	0.10	NV	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Dinitrotoluene (2,4 & 2,6)	ug/g dry	0.20	0.5	ND (0.20)	ND (0.20)	N/A	ND (0.20)
3,3'-Dichlorobenzidine	ug/g dry	0.10	1.0	ND (0.10)	ND (0.10)	N/A	ND (0.10)
4-Chloroaniline	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Acenaphthene	ug/g dry	0.05	21	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Acenaphthylene	ug/g dry	0.05	0.15	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Anthracene	ug/g dry	0.05	0.67	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[a]anthracene	ug/g dry	0.05	0.96	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[a]pyrene	ug/g dry	0.05	0.3	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[b]fluoranthene	ug/g dry	0.05	0.96	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[g,h,i]perylene	ug/g dry	0.05	9.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[k]fluoranthene	ug/g dry	0.05	0.96	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1-Biphenyl	ug/g dry	0.05	52	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Bis(2-chloroethyl)ether	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Bis(2-chloroisopropyl)ether	ug/g dry	0.10	11	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Bis(2-ethylhexyl)phthalate	ug/g dry	0.10	28	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Chrysene	ug/g dry	0.05	9.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Diethylphthalate	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Dimethylphthalate	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Dibenzo[a,h]anthracene	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Fluoranthene	ug/g dry	0.05	9.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Fluorene	ug/g dry	0.05	62	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Indeno [1,2,3-cd] pyrene	ug/g dry	0.05	0.76	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Naphthalene	ug/g dry	0.05	9.6	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Phenanthrene	ug/g dry	0.05	12	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Pyrene	ug/g dry	0.05	96	ND (0.05)	ND (0.05)	N/A	ND (0.05)
2,4,5-Trichlorophenol	ug/g dry	0.10	9.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4,6-Trichlorophenol	ug/g dry	0.10	2.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4-Dichlorophenol	ug/g dry	0.10	0.19	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4-Dimethylphenol	ug/g dry	0.10	38	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4-Dinitrophenol	ug/g dry	0.10	2.0	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2-Chlorophenol	ug/g dry	0.10	3.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Pentachlorophenol	ug/g dry	0.10	2.9	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Phenol	ug/g dry	0.10	9.4	ND (0.10)	ND (0.10)	N/A	ND (0.10)

2.00 Sample exceeds Reg 153/04-Table 2 Industrial, coarse Standards
ND (0.2) No concentrations identified above the MDL
NA Parameter not analysed
NV No value given for indicated parameter

Parameter	Units	MDL	Regulation	Sample PE6526			
				BH1-24-SS4 2425459-01	BH3-24-SS5 2425459-03	BH5-24-SS2 2425459-04	DUP 01 2425459-05
Sample Depth (m)			Reg 406/19-Table 1 Agricultural	2.29 - 2.90	3.05 - 3.66	0.76 - 1.37	3.05 - 3.66
Sample Date				18-Jun-2024	18-Jun-2024	18-Jun-2024	18-Jun-2024
Phsical Characteristics							
% Solids	% by Wt.	0.1		91.6	86.9	90.6	87.5
General Inorganics							
pH	pH Units	0.05	NV	N/A	7.37	7.45	N/A
Metals							
Antimony	ug/g dry	0.05	1.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Arsenic	ug/g dry	1.0	11	1.9	1.9	2.2	1.9
Barium	ug/g dry	1.0	210	58.3	52.1	39.7	49.6
Beryllium	ug/g dry	0.5	2.5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Boron	ug/g dry	0.5	36	ND (5.0)	ND (5.0)	6.4	ND (5.0)
Cadmium	ug/g dry	0.5	1.0	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chromium (VI)	ug/g dry	0.2	0.66	ND (0.2)	ND (0.2)	N/A	ND (0.2)
Chromium	ug/g dry	5	67	11.9	11.4	12.2	9.6
Cobalt	ug/g dry	1	19	4.8	4.6	5.3	4.1
Copper	ug/g dry	5	62	9.7	9.3	10.5	8.1
Lead	ug/g dry	1	45	3.5	2.9	3.6	2.5
Mercury	ug/g dry	0.1	0.16	ND (0.1)	ND (0.1)	N/A	ND (0.1)
Molybdenum	ug/g dry	1	2.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Nickel	ug/g dry	5	37	7.9	7.4	8.8	6.2
Selenium	ug/g dry	1	1.2	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Silver	ug/g dry	0.3	0.5	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Thallium	ug/g dry	1	1.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	ug/g dry	5	1.9	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vanadium	ug/g dry	1	86	23.1	22.2	22.6	20.3
Zinc	ug/g dry	10	290	ND (20.0)	ND (20.0)	ND (20.0)	ND (20.0)
Volatiles							
Acetone	ug/g dry	0.50	0.5	ND (0.50)	ND (0.50)	N/A	ND (0.50)
Benzene	ug/g dry	0.02	0.02	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Bromoform	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Bromomethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Carbon Tetrachloride	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Chlorobenzene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Chloroform	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Dibromochloromethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Dichlorodifluoromethane	ug/g dry	0.20	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,2-Dichlorobenzene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,3-Dichlorobenzene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,4-Dichlorobenzene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1-Dichloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,2-Dichloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1-Dichloroethylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
cis-1,2-Dichloroethylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,2-Dichloropropane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
cis-1,3-Dichloropropylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
trans-1,3-Dichloropropylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,3-Dichloropropene, total	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Ethylbenzene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Hexane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.05	0.5	ND (0.50)	ND (0.50)	N/A	ND (0.50)
Methyl Isobutyl Ketone	ug/g dry	0.05	0.5	ND (0.50)	ND (0.50)	N/A	ND (0.50)
Methyl tert-butyl ether	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Methylene Chloride	ug/g dry	0.50	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Styrene	ug/g dry	2.00	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1,1,2-Tetrachloroethane	ug/g dry	0.50	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Tetrachloroethylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Toluene	ug/g dry	0.05	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1,2-Trichloroethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Trichloroethylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Trichlorofluoromethane	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Vinyl Chloride	ug/g dry	0.05	0.02	ND (0.02)	ND (0.02)	N/A	ND (0.02)
m/p-Xylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hydrocarbons							
F1 PHCs (C6-C10)	ug/g dry	7	17	ND (7)	ND (7)	ND (7)	ND (7)
F2 PHCs (C10-C16)	ug/g dry	4	10	ND (4)	ND (4)	ND (4)	ND (4)
F3 PHCs (C16-C34)	ug/g dry	8	240	ND (8)	ND (8)	ND (8)	ND (8)
F4 PHCs (C34-C50)	ug/g dry	6	120	ND (6)	ND (6)	ND (6)	ND (6)
Semi-Volatiles							
1,2,4-Trichlorobenzene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1-Methylnaphthalene	ug/g dry	0.05	NV	ND (0.05)	ND (0.05)	N/A	ND (0.05)
2-Methylnaphthalene	ug/g dry	0.05	NV	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Methylnaphthalene (1&2)	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
2,4-Dinitrotoluene	ug/g dry	0.10	NV	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,6-Dinitrotoluene	ug/g dry	0.10	NV	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Dinitrotoluene (2,4 & 2,6)	ug/g dry	0.20	0.5	ND (0.20)	ND (0.20)	N/A	ND (0.20)
3,3'-Dichlorobenzidine	ug/g dry	0.10	1.0	ND (0.10)	ND (0.10)	N/A	ND (0.10)
4-Chloroaniline	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Acenaphthene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Acenaphthylene	ug/g dry	0.05	0.093	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Anthracene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[a]anthracene	ug/g dry	0.05	0.095	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[a]pyrene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[b]fluoranthene	ug/g dry	0.05	0.3	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[g,h,i]perylene	ug/g dry	0.05	0.2	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Benzo[k]fluoranthene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
1,1-Biphenyl	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Bis(2-chloroethyl)ether	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Bis(2-chloroisopropyl)ether	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Bis(2-ethylhexyl)phthalate	ug/g dry	0.10	5.0	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Chrysene	ug/g dry	0.05	0.18	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Diethylphthalate	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Dimethylphthalate	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Dibenzo[a,h]anthracene	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Fluoranthene	ug/g dry	0.05	0.24	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Fluorene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Indeno [1,2,3-cd] pyrene	ug/g dry	0.05	0.11	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Naphthalene	ug/g dry	0.05	0.05	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Phenanthrene	ug/g dry	0.05	0.19	ND (0.05)	ND (0.05)	N/A	ND (0.05)
Pyrene	ug/g dry	0.05	0.19	ND (0.05)	ND (0.05)	N/A	ND (0.05)
2,4,5-Trichlorophenol	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4,6-Trichlorophenol	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4-Dichlorophenol	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4-Dimethylphenol	ug/g dry	0.10	0.2	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2,4-Dinitrophenol	ug/g dry	0.10	2.0	ND (0.10)	ND (0.10)	N/A	ND (0.10)
2-Chlorophenol	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Pentachlorophenol	ug/g dry	0.10	0.1	ND (0.10)	ND (0.10)	N/A	ND (0.10)
Phenol	ug/g dry	0.10	0.5	ND (0.10)	ND (0.10)	N/A	ND (0.10)

2.00 Sample exceeds Reg 406/19-Table 1 Agricultural Standards
ND (0.2) No concentrations identified above the MDL
NA Parameter not analysed
NV No value given for indicated parameter

Parameter	Units	MDL	Regulation	Sample PE6526		
				BH1-24-GW1 2426251-01	BH3-24-GW1 2426251-02	DUP-June25 2426251-03
Sample Depth (m)			Reg 153/04-Table 2 Potable Groundwater, coarse	2.01 - 3.51	3.18 - 4.70	2.01 - 3.51
Sample Date				25-Jun-2024	25-Jun-2024	25-Jun-2024
Metals						
Mercury	ug/L	0.1	0.29	ND (0.1)	ND (0.1)	ND (0.1)
Antimony	ug/L	0.5	6.0	ND (0.5)	ND (0.5)	ND (0.5)
Arsenic	ug/L	1	25	ND (1)	ND (1)	ND (1)
Barium	ug/L	1	1000	197	67	175
Beryllium	ug/L	0.5	4.0	ND (0.5)	ND (0.5)	ND (0.5)
Boron	ug/L	10	5000	26	59	26
Cadmium	ug/L	0.1	2.7	ND (0.1)	ND (0.1)	ND (0.1)
Chromium	ug/L	1	50	ND (1)	ND (1)	ND (1)
Chromium (VI)	ug/L	10	25	ND (10)	ND (10)	ND (10)
Cobalt	ug/L	0.5	3.8	ND (0.5)	0.8	ND (0.5)
Copper	ug/L	0.5	87	2.2	0.7	0.8
Lead	ug/L	0.1	10	0.1	ND (0.1)	ND (0.1)
Molybdenum	ug/L	0.5	70	5.4	1.9	6.3
Nickel	ug/L	1	100	ND (1)	3	ND (1)
Selenium	ug/L	1	10	ND (1)	ND (1)	ND (1)
Silver	ug/L	0.1	1.5	ND (0.1)	ND (0.1)	ND (0.1)
Sodium	ug/L	200	490000	22200	77000	23400
Thallium	ug/L	0.1	2.0	ND (0.1)	ND (0.1)	ND (0.1)
Uranium	ug/L	0.1	20	2.5	2.3	2.3
Vanadium	ug/L	0.5	6.2	0.7	0.8	0.7
Zinc	ug/L	5	1100	ND (5)	ND (5)	ND (5)
Volatiles						
Acetone	ug/L	5.0	2700	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	ug/L	0.5	5.0	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	ug/L	0.5	16	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	ug/L	0.5	25	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	ug/L	0.5	0.89	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	ug/L	0.2	0.79	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	ug/L	0.5	30	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	ug/L	0.5	2.4	ND (0.5)	ND (0.5)	ND (0.5)
Dibromochloromethane	ug/L	0.5	25	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	ug/L	1.0	590	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	ug/L	0.5	3.0	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	ug/L	0.5	59	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	ug/L	0.5	1.0	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	ug/L	0.5	5.0	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	ug/L	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	ug/L	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	ug/L	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	ug/L	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	ug/L	0.5	5.0	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene	ug/L	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene	ug/L	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	ug/L	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	2.4	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromoethane, 1	ug/L	0.2	NV	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	ug/L	1.0	51	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	NV	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	ug/L	5.0	640	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	ug/L	2.0	15	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	ug/L	5.0	50	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	ug/L	0.5	5.4	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	ug/L	0.5	1.0	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	ug/L	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	ug/L	0.5	24	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	ug/L	0.5	200	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	ug/L	0.5	4.7	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	ug/L	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	ug/L	1.0	150	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	ug/L	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5	300	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene	ug/L	0.5	300	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	300	ND (0.5)	ND (0.5)	ND (0.5)
Hydrocarbons						
F1 PHCs (C6-C10)	ug/L	25	750	ND (25)	ND (25)	ND (25)
F2 PHCs (C10-C16)	ug/L	100	150	ND (100)	ND (100)	ND (100)
F3 PHCs (C16-C34)	ug/L	100	500	ND (100)	ND (100)	ND (100)
F4 PHCs (C34-C50)	ug/L	100	500	ND (100)	ND (100)	ND (100)
Semi-Volatiles			NV			
1-Methylnaphthalene	ug/L	1	3.2	ND (1)	ND (1)	ND (1)
1,2,4-Trichlorobenzene	ug/L	0.5	70	ND (0.5)	ND (0.5)	ND (0.5)
2,4-Dinitrotoluene	ug/L	2	0.0	ND (2)	ND (2)	ND (2)
2,6-Dinitrotoluene	ug/L	2	NV	ND (2)	ND (2)	ND (2)
Dinitrotoluene (2,4 & 2,6)	ug/L	3	5.0	ND (3)	ND (3)	ND (3)
2-Methylnaphthalene	ug/L	1	3.2	ND (1)	ND (1)	ND (1)
Methylnaphthalene (1&2)	ug/L	1	3.2	ND (1)	ND (1)	ND (1)
3,3'-Dichlorobenzidine	ug/L	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)
4-Chloroaniline	ug/L	10	10	ND (10)	ND (10)	ND (10)
Acenaphthene	ug/L	1	4.1	ND (1)	ND (1)	ND (1)
Anthracene	ug/L	0.1	2.4	ND (0.1)	ND (0.1)	ND (0.1)
Acenaphthylene	ug/L	1	1.0	ND (1)	ND (1)	ND (1)
Benzo[a]anthracene	ug/L	0.2	1.0	ND (0.2)	ND (0.2)	ND (0.2)
Benzo[a]pyrene	ug/L	0.01	0.01	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[g,h,i]perylene	ug/L	0.2	0.2	ND (0.2)	ND (0.2)	ND (0.2)
Benzo[b]fluoranthene	ug/L	0.1	0.1	ND (0.1)	ND (0.1)	ND (0.1)
Benzo[k]fluoranthene	ug/L	0.1	0.1	ND (0.1)	ND (0.1)	ND (0.1)
1,1-Biphenyl	ug/L	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)
Bis(2-chloroethyl)ether	ug/L	5	5.0	ND (5)	ND (5)	ND (5)
Bis(2-chloroisopropyl)ether	ug/L	4	120	ND (4)	ND (4)	ND (4)
Bis(2-ethylhexyl)phthalate	ug/L	10	10	ND (10)	ND (10)	ND (10)
Chrysene	ug/L	0.1	0.1	ND (0.1)	ND (0.1)	ND (0.1)
Dibenzo[a,h]anthracene	ug/L	0.2	0.2	ND (0.2)	ND (0.2)	ND (0.2)
Diethylphthalate	ug/L	2	38	ND (2)	ND (2)	ND (2)
Dimethylphthalate	ug/L	2	38	ND (2)	ND (2)	ND (2)
Fluoranthene	ug/L	0.4	0.41	ND (0.4)	ND (0.4)	ND (0.4)
Fluorene	ug/L	0.5	120	ND (0.5)	ND (0.5)	ND (0.5)
Indeno [1,2,3-cd] pyrene	ug/L	0.2	NV	ND (0.2)	ND (0.2)	ND (0.2)
Naphthalene	ug/L	2	11	ND (2)	ND (2)	ND (2)
Phenanthrene	ug/L	0.1	1.0	ND (0.1)	ND (0.1)	ND (0.1)
Pyrene	ug/L	0.2	4.1	ND (0.2)	ND (0.2)	ND (0.2)
2,4,5-Trichlorophenol	ug/L	0.2	8.9	ND (0.2)	ND (0.2)	ND (0.2)
2,4,6-Trichlorophenol	ug/L	0.2	2.0	ND (0.2)	ND (0.2)	ND (0.2)
2,4-Dichlorophenol	ug/L	20	20	ND (20)	ND (20)	ND (20)
2,4-Dimethylphenol	ug/L	10	59	ND (10)	ND (10)	ND (10)
2,4-Dinitrophenol	ug/L	10	10	ND (10)	ND (10)	ND (10)
2-Chlorophenol	ug/L	2	8.9	ND (2)	ND (2)	ND (2)
Pentachlorophenol	ug/L	0.5	30	ND (0.5)	ND (0.5)	ND (0.5)
Phenol	ug/L	1	890	ND (1)	ND (1)	ND (1)

2.00 Sample exceeds Reg 153/04-Table 2 Potable Groundwater, coarse Standards
ND (0.2) No concentrations identified above the MDL
NA Parameter not analysed
NV No value given for indicated parameter

APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ANALYTICAL TEST RESULTS

LABORATORY CERTIFICATE OF ANALYSIS

PATERSON GROUP

Sampling and Analysis Plan

5923 Ottawa Street Ottawa,
Prepared for Stratford-Fox Run

Report: PE6526-SAP
Date: August 1, 2024

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1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Mr. Joshua Laginski on behalf of Stratford-Fox Run, to conduct a Phase II – Environmental Site Assessment (Phase II-ESA) in conjunction with a geotechnical investigation at 5923 Ottawa Street, in the City of Ottawa (Richmond), Ontario.

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

Borehole/Test Pit	Location & Rationale	Proposed Depth & Rationale
BH1-24	Place on the south corner of the Phase II Property for geotechnical purposes and to assess potential soil and groundwater impacts resulting from the presence of the historic instrument manufacturing facility.	5-7 m; Drill to intercept water table for monitoring well installation.
BH2-24	Place on the east portion of the Phase II Property for geotechnical purposes and to assess potential soil and groundwater impacts resulting from the presence of the historic instrument manufacturing facility.	5-7 m; Drill to intercept water table for monitoring well installation.
BH3-24	Placed on the west portion of the Phase II Property for geotechnical purposes and to assess potential soil and groundwater impacts resulting from the presence of the historic instrument manufacturing facility.	5-7 m; Drill to intercept water table for monitoring well installation.
BH4-24	Place on the west central portion of the Phase II Property for geotechnical purposes and to assess potential soil and groundwater impacts resulting from the presence of the historic instrument manufacturing facility.	To 5-7 m or practical auger refusal on inferred bedrock.
BH5-24	Placed on the south-central portion of the Phase II Property for geotechnical purposes and to assess potential soil and groundwater impacts resulting from the presence of the historic instrument manufacturing facility.	5-7 m; Drill to intercept water table for monitoring well installation.

Borehole, locations are shown on Drawing PE6526-3 – 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 or until the borehole has extended to a depth beyond the requirements of the geotechnical and environmental investigations. 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 boreholes (BH1-24, BH2-24, BH3-24 and BH5-24) for the collection of groundwater samples. A piezometer will also be installed in BH4-24 for monitoring of groundwater levels.

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.

- ❒ In the case where there is visual or olfactory evidence of contamination, or organic vapour meter or photoionization detector readings indicate the presence of contamination on site then 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:

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

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.

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

SOIL PROFILE AND TEST DATA

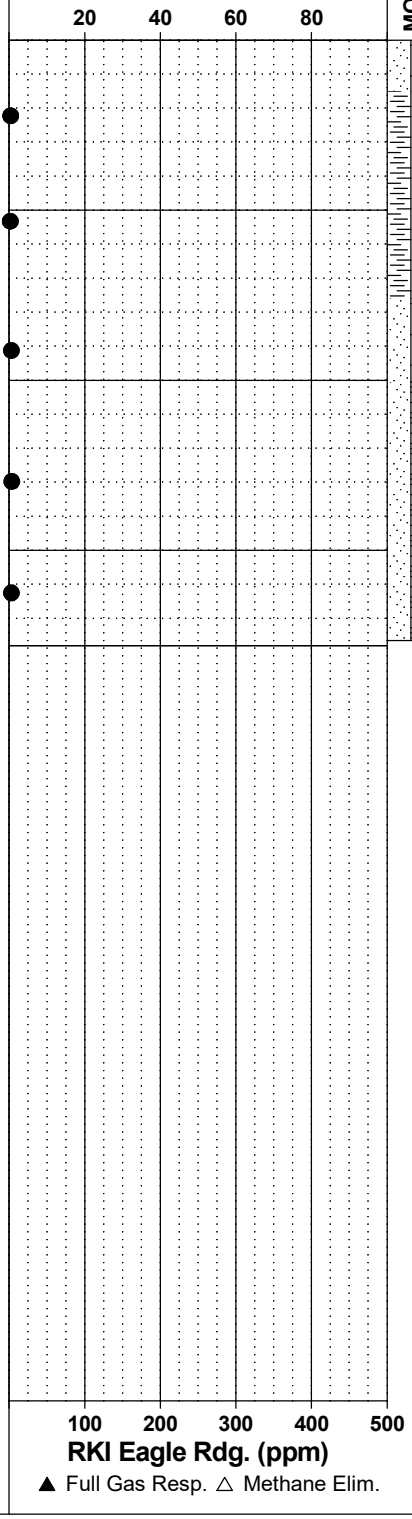
Phase I Environmental Site Assessment
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358362.138 **NORTHING:** 5005913.959 **ELEVATION:** 94.20
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2024 June 17

FILE NO. PE6526
HOLE NO. BH 1-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	94.20
TOPSOIL and organics							
0.28							
GLACIAL TILL: Dense brown silty sand to sandy silt with gravel, cobbles and boulders, trace clay		AU	1				
- Clay content decreasing with depth		SS	2	83	26	1	93.20
		SS	3	58	31	2	92.20
- Very dense by 2.4 m depth		SS	4	83	46		
		SS	5	100	+50	3	91.20
3.56							
End of Borehole							
Practical refusal to augering at 3.56 m depth							
(GWL at 0.28 m - June 25, 2024)							

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



MONITORING WELL CONSTRUCTION

PATERSON GROUP
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Ottawa, Ontario
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TEL: (613) 226-7381

SOIL PROFILE AND TEST DATA

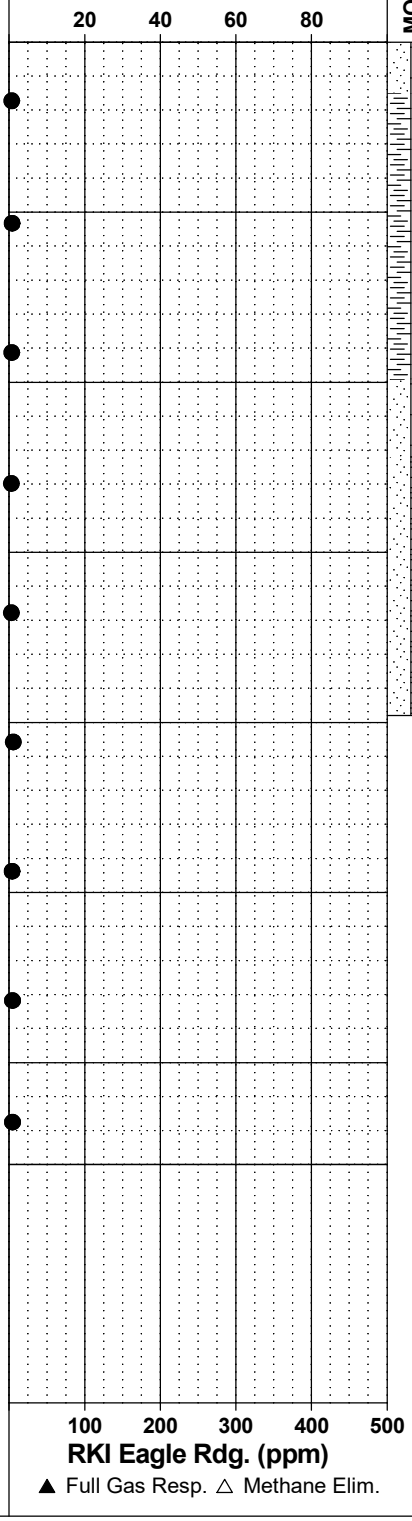
Phase I Environmental Site Assessment
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358409.319 **NORTHING:** 5005999.639 **ELEVATION:** 93.69
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2024 June 17

FILE NO. PE6526
HOLE NO. BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	93.69
TOPSOIL and organics 0.08							
Hard to very stiff brown **SILTY CLAY**		AU	1				
		SS	2	100	9	1	92.69
1.45							
GLACIAL TILL: Dense brown silty sand with gravel, cobbles and boulders, trace clay		SS	3	67	27	2	91.69
- Clay content decreasing with depth		SS	4	58	20		
		SS	5	83	24	3	90.69
3.73							
GLACIAL TILL: Dense to very dense grey silty sand to sandy silt with gravel, cobbles and boulders		SS	6	58	20	4	89.69
		SS	7	100	38	5	88.69
		SS	8	92	33		
		SS	9	100	+50	6	87.69
6.60							
End of Borehole							
(GWL at 0.05 m - June 25, 2024)							

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



MONITORING WELL CONSTRUCTION

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Ottawa, Ontario
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SOIL PROFILE AND TEST DATA

Phase I Environmental Site Assessment
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358326.994 **NORTHING:** 5005950.976 **ELEVATION:** 93.85
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2024 June 17

FILE NO. PE6526
HOLE NO. BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	93.85
TOPSOIL and organics, trace clay							
0.20							
Very stiff brown **SILTY CLAY**		AU	1				
0.61						1	92.85
GLACIAL TILL: Compact to dense brown silty sand to sandy silt with gravel, cobbles and boulders, trace clay		SS	2	67	21		
- Clay content decreasing with depth		SS	3	67	15	2	91.85
		SS	4	58	33		
		SS	5	83	28	3	90.85
4.11		SS	6	83	36		
GLACIAL TILL: Very dense grey silty sand to sandy silt with gravel, cobbles and boulders		SS	7	50	50	4	89.85
		SS	8	58	26		
		SS	9		+50	5	88.85
6.71						6	87.85
End of Borehole							
(GWL at 0.10 m - June 25, 2024)							

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

20 40 60 80

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

MONITORING WELL CONSTRUCTION

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TEL: (613) 226-7381

SOIL PROFILE AND TEST DATA

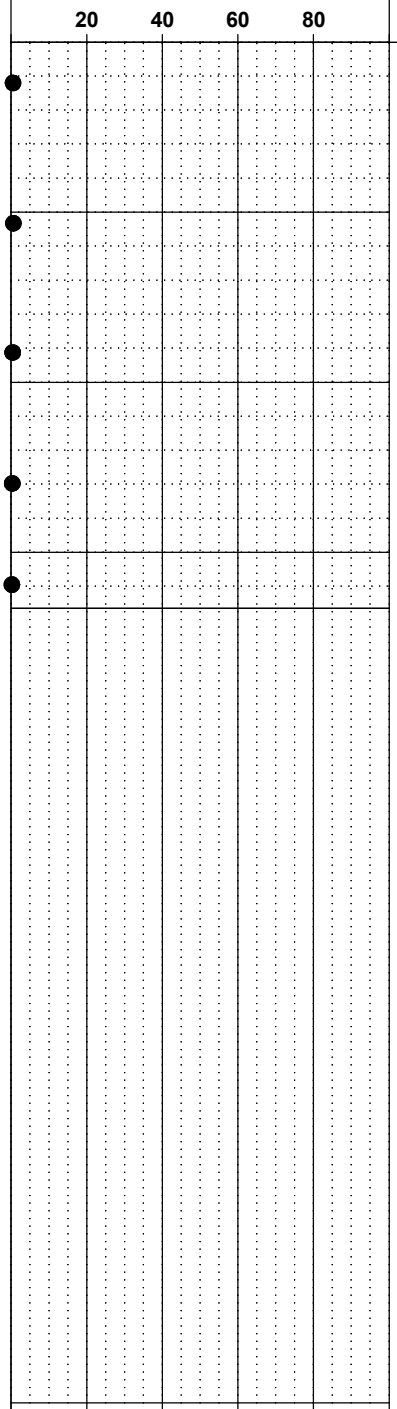
Phase I Environmental Site Assessment
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358331.858 **NORTHING:** 5005978.835 **ELEVATION:** 94.11
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2024 June 17

FILE NO. PE6526
HOLE NO. BH 4-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL and organics 0.13						0	94.11
GLACIAL TILL: Dense brown silty sand to sandy silt with gravel, cobbles and boulders, some to trace clay		AU	1				
		SS	2	50	34	1	93.11
		SS	3	100	16	2	92.11
		SS	4	42	32		
3.33		SS	5	91	+50	3	91.11
End of Borehole							
(GWL at 0.45 m - June 25, 2024)							

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



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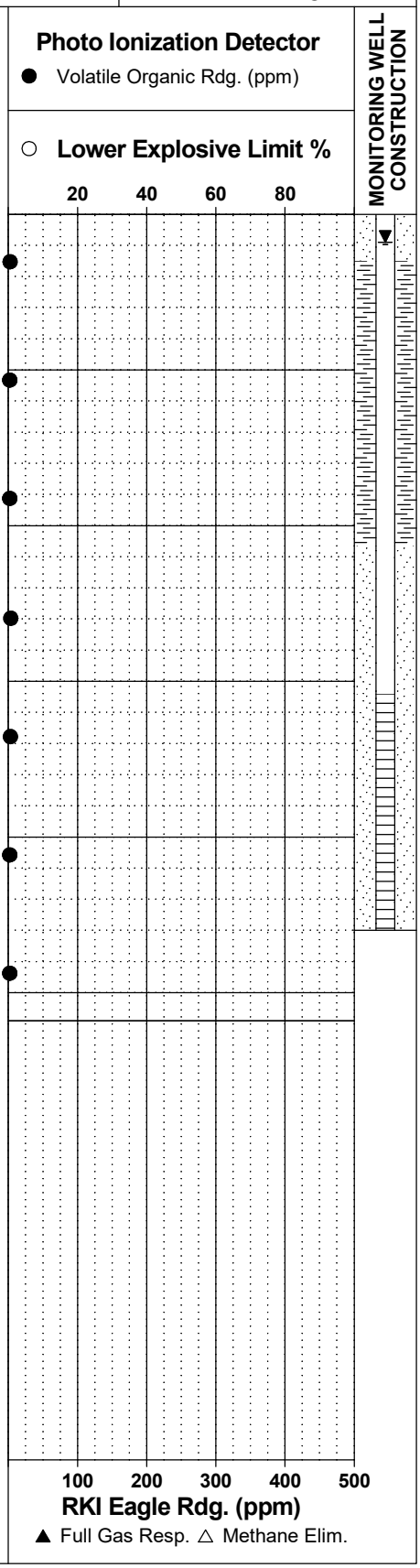
SOIL PROFILE AND TEST DATA

Phase I Environmental Site Assessment
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358383.011 **NORTHING:** 5005949.836 **ELEVATION:** 93.92
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2024 June 17

FILE NO. PE6526
HOLE NO. BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL and organics						0	93.92
0.25							
GLACIAL TILL: Dense brown silty sand to sandy silt with gravel, cobbles and boulders, some to trace clay		AU	1				
- Clay content decreasing with depth		SS	2	100	26	1	92.92
		SS	3	92	+50	2	91.92
		SS	4	83	22		
		SS	5	25	15	3	90.92
3.51							
GLACIAL TILL: Compact to dense grey silty sand to sandy silt with gravel, cobbles and boulders		SS	6	42	21	4	89.92
		SS	7		14	5	88.92
5.18							
End of Borehole							
(GWL at 0.18 m - June 25, 2024)							



SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

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

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

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

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

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

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

ROCK DESCRIPTION

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

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

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

SAMPLE TYPES

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

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

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

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

CONSOLIDATION TEST

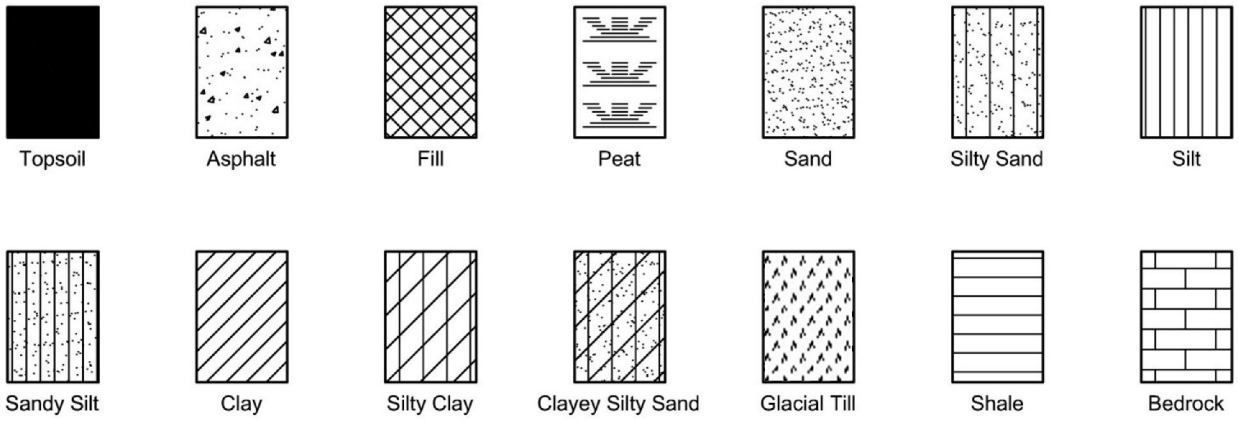
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

PERMEABILITY TEST

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

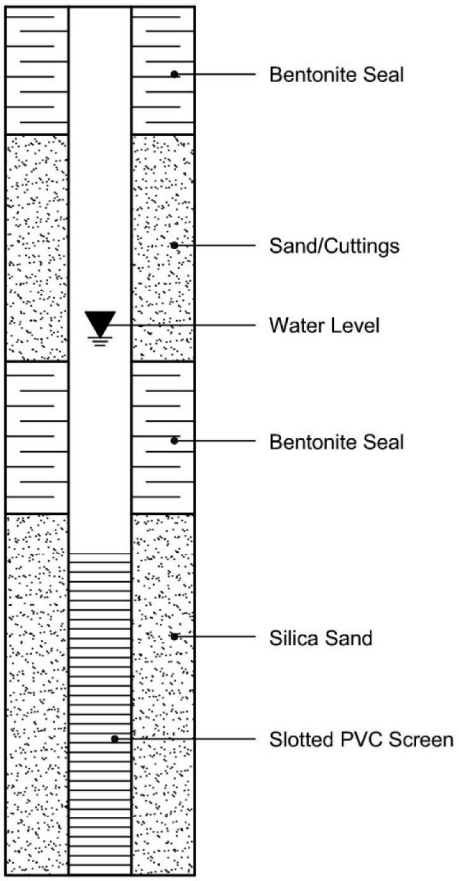
SYMBOLS AND TERMS (continued)

STRATA PLOT

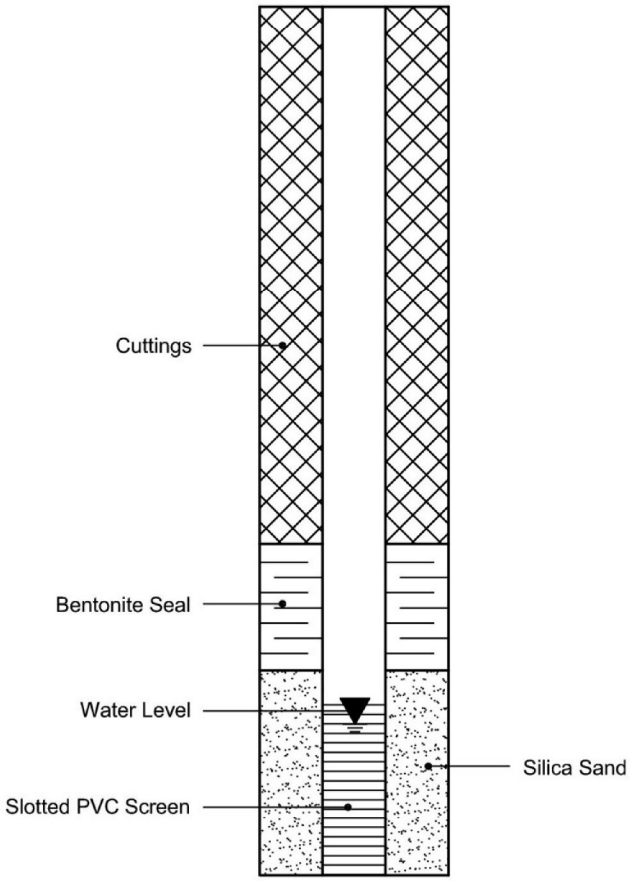


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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Certificate of Analysis

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

Client PO: 60460
Project: PE6526
Custody:

Report Date: 26-Jun-2024
Order Date: 20-Jun-2024

Order #: 2425459

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

Paracel ID	Client ID
2425459-01	BH1-24-SS4
2425459-03	BH3-24-SS5
2425459-04	BH5-24-SS2
2425459-05	DUP 01

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	24-Jun-24	24-Jun-24
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	21-Jun-24	24-Jun-24
Mercury by CVAA	EPA 7471B - CVAA, digestion	25-Jun-24	25-Jun-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	24-Jun-24	25-Jun-24
PHC F1	CWS Tier 1 - P&T GC-FID	21-Jun-24	22-Jun-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	21-Jun-24	23-Jun-24
REG 153: ABNs + PAHs, soil	based on SW-846 8270	25-Jun-24	25-Jun-24
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	24-Jun-24	25-Jun-24
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	21-Jun-24	22-Jun-24
Solids, %	CWS Tier 1 - Gravimetric	25-Jun-24	26-Jun-24

Certificate of Analysis

Report Date: 26-Jun-2024

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

Order Date: 20-Jun-2024

Client PO: 60460

Project Description: PE6526

	Client ID:	BH1-24-SS4	BH3-24-SS5	BH5-24-SS2	DUP 01	-	-
	Sample Date:	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00		
	Sample ID:	2425459-01	2425459-03	2425459-04	2425459-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	91.6	86.9	90.6	87.5	-	-
General Inorganics							
pH	0.05 pH Units	-	7.37	7.45	-	-	-
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Arsenic	1.0 ug/g	1.9	1.9	2.2	1.9	-	-
Barium	1.0 ug/g	58.3	52.1	39.7	49.6	-	-
Beryllium	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	-	-
Boron	5.0 ug/g	<5.0	<5.0	6.4	<5.0	-	-
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	-	-
Chromium	5.0 ug/g	11.9	11.4	12.2	9.6	-	-
Cobalt	1.0 ug/g	4.8	4.6	5.3	4.1	-	-
Copper	5.0 ug/g	9.7	9.3	10.5	8.1	-	-
Lead	1.0 ug/g	3.5	2.9	3.6	2.5	-	-
Mercury	0.1 ug/g	<0.1	<0.1	-	<0.1	-	-
Molybdenum	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Nickel	5.0 ug/g	7.9	7.4	8.8	6.2	-	-
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	<1.0	<1.0	-	-
Vanadium	10.0 ug/g	23.1	22.2	22.6	20.3	-	-
Zinc	20.0 ug/g	<20.0	<20.0	<20.0	<20.0	-	-
Volatiles							

	Client ID:	BH1-24-SS4	BH3-24-SS5	BH5-24-SS2	DUP 01	-	-
	Sample Date:	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00		
	Sample ID:	2425459-01	2425459-03	2425459-04	2425459-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
Acetone	0.50 ug/g	<0.50	<0.50	-	<0.50	-	-
Benzene	0.02 ug/g	<0.02	<0.02	-	<0.02	-	-
Bromodichloromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Bromoform	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Bromomethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Chlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Chloroform	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Dibromochloromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Ethylene dibromide (dibromoethane,	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Ethylbenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Hexane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-

	Client ID:	BH1-24-SS4	BH3-24-SS5	BH5-24-SS2	DUP 01	-	-
	Sample Date:	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00		
	Sample ID:	2425459-01	2425459-03	2425459-04	2425459-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g	<0.50	<0.50	-	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g	<0.50	<0.50	-	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Methylene Chloride	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Styrene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Tetrachloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Toluene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Trichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Vinyl chloride	0.02 ug/g	<0.02	<0.02	-	<0.02	-	-
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	-	-
4-Bromofluorobenzene	Surrogate	127%	115%	-	127%	-	-
Toluene-d8	Surrogate	121%	110%	-	119%	-	-
Dibromofluoromethane	Surrogate	101%	100%	-	102%	-	-
Benzene	0.02 ug/g	-	-	<0.02	-	-	-
Ethylbenzene	0.05 ug/g	-	-	<0.05	-	-	-
Toluene	0.05 ug/g	-	-	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g	-	-	<0.05	-	-	-
o-Xylene	0.05 ug/g	-	-	<0.05	-	-	-

	Client ID:	BH1-24-SS4	BH3-24-SS5	BH5-24-SS2	DUP 01	-	-
	Sample Date:	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00		
	Sample ID:	2425459-01	2425459-03	2425459-04	2425459-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
Xylenes, total	0.05 ug/g	-	-	<0.05	-	-	-
Toluene-d8	Surrogate	-	-	104%	-	-	-
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							
1,2,4-Trichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
1-Methylnaphthalene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
2-Methylnaphthalene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Methylnaphthalene (1&2)	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
2,4-Dinitrotoluene	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2,6-Dinitrotoluene	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Dinitrotoluene (2,4 & 2,6)	0.20 ug/g	<0.20	<0.20	-	<0.20	-	-
3,3'-Dichlorobenzidine	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
4-Chloroaniline	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Acenaphthene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Acenaphthylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Anthracene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Benzo [a] anthracene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Benzo [a] pyrene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Benzo [b] fluoranthene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-

	Client ID:	BH1-24-SS4	BH3-24-SS5	BH5-24-SS2	DUP 01	-	-
	Sample Date:	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00		
	Sample ID:	2425459-01	2425459-03	2425459-04	2425459-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
Biphenyl	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Bis(2-chloroethyl)ether	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Bis(2-chloroisopropyl)ether	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Bis(2-ethylhexyl)phthalate	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Chrysene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Diethylphthalate	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Dimethylphthalate	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Dibenzo [a,h] anthracene	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Fluoranthene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Fluorene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Naphthalene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Phenanthrene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
Pyrene	0.05 ug/g	<0.05	<0.05	-	<0.05	-	-
2,4,5-Trichlorophenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2,4,6-Trichlorophenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2,4-Dichlorophenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2,4-Dimethylphenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2,4-Dinitrophenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2-Chlorophenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Pentachlorophenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
Phenol	0.10 ug/g	<0.10	<0.10	-	<0.10	-	-
2-Fluorobiphenyl	Surrogate	87.2%	85.2%	-	82.9%	-	-
Nitrobenzene-d5	Surrogate	56.2%	55.6%	-	54.2%	-	-
Terphenyl-d14	Surrogate	99.6%	105%	-	95.4%	-	-

	Client ID:	BH1-24-SS4	BH3-24-SS5	BH5-24-SS2	DUP 01	-	-
	Sample Date:	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00	18-Jun-24 09:00		
	Sample ID:	2425459-01	2425459-03	2425459-04	2425459-05		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
2,4,6-Tribromophenol	Surrogate	98.2%	100%	-	89.0%	-	-
2-Fluorophenol	Surrogate	140%	138%	-	126%	-	-
Phenol-d6	Surrogate	73.9%	72.7%	-	81.7%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
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								
1,2,4-Trichlorobenzene	ND	0.05	ug/g					
1-Methylnaphthalene	ND	0.05	ug/g					
2-Methylnaphthalene	ND	0.05	ug/g					
Methylnaphthalene (1&2)	ND	0.05	ug/g					
2,4-Dinitrotoluene	ND	0.10	ug/g					
2,6-Dinitrotoluene	ND	0.10	ug/g					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Dinitrotoluene (2,4 & 2,6)	ND	0.20	ug/g					
3,3'-Dichlorobenzidine	ND	0.10	ug/g					
4-Chloroaniline	ND	0.10	ug/g					
Acenaphthene	ND	0.05	ug/g					
Acenaphthylene	ND	0.05	ug/g					
Anthracene	ND	0.05	ug/g					
Benzo [a] anthracene	ND	0.05	ug/g					
Benzo [a] pyrene	ND	0.05	ug/g					
Benzo [b] fluoranthene	ND	0.05	ug/g					
Benzo [g,h,i] perylene	ND	0.05	ug/g					
Benzo [k] fluoranthene	ND	0.05	ug/g					
Biphenyl	ND	0.05	ug/g					
Bis(2-chloroethyl)ether	ND	0.10	ug/g					
Bis(2-chloroisopropyl)ether	ND	0.10	ug/g					
Bis(2-ethylhexyl)phthalate	ND	0.10	ug/g					
Chrysene	ND	0.05	ug/g					
Diethylphthalate	ND	0.10	ug/g					
Dimethylphthalate	ND	0.10	ug/g					
Dibenzo [a,h] anthracene	ND	0.10	ug/g					
Fluoranthene	ND	0.05	ug/g					
Fluorene	ND	0.05	ug/g					
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/g					
Naphthalene	ND	0.05	ug/g					
Phenanthrene	ND	0.05	ug/g					
Pyrene	ND	0.05	ug/g					
2,4,5-Trichlorophenol	ND	0.10	ug/g					
2,4,6-Trichlorophenol	ND	0.10	ug/g					
2,4-Dichlorophenol	ND	0.10	ug/g					
2,4-Dimethylphenol	ND	0.10	ug/g					
2,4-Dinitrophenol	ND	0.10	ug/g					
2-Chlorophenol	ND	0.10	ug/g					
Pentachlorophenol	ND	0.10	ug/g					
Phenol	ND	0.10	ug/g					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: 2-Fluorobiphenyl	*0.476*		*%*	*71.4*	*50-140*			
Surrogate: Nitrobenzene-d5	*0.350*		*%*	*52.5*	*50-140*			
Surrogate: Terphenyl-d14	*0.558*		*%*	*83.6*	*50-140*			
Surrogate: 2,4,6-Tribromophenol	*1.05*		*%*	*79.1*	*50-140*			
Surrogate: 2-Fluorophenol	*1.83*		*%*	*138*	*50-140*			
Surrogate: Phenol-d6	*0.782*		*%*	*58.7*	*50-140*			
Volatiles								
Acetone	ND	0.50	ug/g					
Benzene	ND	0.02	ug/g					
Bromodichloromethane	ND	0.05	ug/g					
Bromoform	ND	0.05	ug/g					
Bromomethane	ND	0.05	ug/g					
Carbon Tetrachloride	ND	0.05	ug/g					
Chlorobenzene	ND	0.05	ug/g					
Chloroform	ND	0.05	ug/g					
Dibromochloromethane	ND	0.05	ug/g					
Dichlorodifluoromethane	ND	0.05	ug/g					
1,2-Dichlorobenzene	ND	0.05	ug/g					
1,3-Dichlorobenzene	ND	0.05	ug/g					
1,4-Dichlorobenzene	ND	0.05	ug/g					
1,1-Dichloroethane	ND	0.05	ug/g					
1,2-Dichloroethane	ND	0.05	ug/g					
1,1-Dichloroethylene	ND	0.05	ug/g					
cis-1,2-Dichloroethylene	ND	0.05	ug/g					
trans-1,2-Dichloroethylene	ND	0.05	ug/g					
1,2-Dichloropropane	ND	0.05	ug/g					
cis-1,3-Dichloropropylene	ND	0.05	ug/g					
trans-1,3-Dichloropropylene	ND	0.05	ug/g					
1,3-Dichloropropene, total	ND	0.05	ug/g					
Ethylbenzene	ND	0.05	ug/g					
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.05	ug/g					
Hexane	ND	0.05	ug/g					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g					
Methyl Isobutyl Ketone	ND	0.50	ug/g					
Methyl tert-butyl ether	ND	0.05	ug/g					
Methylene Chloride	ND	0.05	ug/g					
Styrene	ND	0.05	ug/g					
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g					
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g					
Tetrachloroethylene	ND	0.05	ug/g					
Toluene	ND	0.05	ug/g					
1,1,1-Trichloroethane	ND	0.05	ug/g					
1,1,2-Trichloroethane	ND	0.05	ug/g					
Trichloroethylene	ND	0.05	ug/g					
Trichlorofluoromethane	ND	0.05	ug/g					
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	*9.53*		*%*	*119*	*50-140*			
Surrogate: Dibromofluoromethane	*7.81*		*%*	*97.7*	*50-140*			
Surrogate: Toluene-d8	*9.17*		*%*	*115*	*50-140*			
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	*7.69*		*%*	*96.2*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.23	0.05	pH Units	7.26			0.4	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	4.3	1.0	ug/g	4.6			5.8	30	
Barium	245	1.0	ug/g	238			2.9	30	
Beryllium	1.1	0.5	ug/g	1.2			4.4	30	
Boron	10.2	5.0	ug/g	11.0			7.2	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	1.2	0.2	ug/g	1.3			8.5	35	
Chromium	93.2	5.0	ug/g	94.0			0.9	30	
Cobalt	16.0	1.0	ug/g	16.2			0.9	30	
Copper	43.5	5.0	ug/g	43.0			1.0	30	
Lead	8.3	1.0	ug/g	8.4			1.1	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	50.8	5.0	ug/g	51.4			1.1	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	75.2	10.0	ug/g	75.9			0.9	30	
Zinc	90.7	20.0	ug/g	91.8			1.3	30	
Physical Characteristics									
% Solids	88.4	0.1	% by Wt.	87.5			1.0	25	
Semi-Volatiles									

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	ND	0.05	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.05	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.05	ug/g	ND			NC	40	
2,4-Dinitrotoluene	ND	0.10	ug/g	ND			NC	40	
2,6-Dinitrotoluene	ND	0.10	ug/g	ND			NC	40	
3,3'-Dichlorobenzidine	ND	0.10	ug/g	ND			NC	40	
4-Chloroaniline	ND	0.10	ug/g	ND			NC	40	
Acenaphthene	ND	0.05	ug/g	ND			NC	40	
Acenaphthylene	ND	0.05	ug/g	ND			NC	40	
Anthracene	ND	0.05	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.05	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.05	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.05	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.05	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.05	ug/g	ND			NC	40	
Biphenyl	ND	0.05	ug/g	ND			NC	40	
Bis(2-chloroethyl)ether	ND	0.10	ug/g	ND			NC	40	
Bis(2-chloroisopropyl)ether	ND	0.10	ug/g	ND			NC	40	
Bis(2-ethylhexyl)phthalate	ND	0.10	ug/g	ND			NC	40	
Chrysene	ND	0.05	ug/g	ND			NC	40	
Diethylphthalate	ND	0.10	ug/g	ND			NC	40	
Dimethylphthalate	ND	0.10	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.10	ug/g	ND			NC	40	
Fluoranthene	ND	0.05	ug/g	ND			NC	40	
Fluorene	ND	0.05	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/g	ND			NC	40	
Naphthalene	ND	0.05	ug/g	ND			NC	40	
Phenanthrene	ND	0.05	ug/g	ND			NC	40	
Pyrene	ND	0.05	ug/g	ND			NC	40	
2,4,5-Trichlorophenol	ND	0.10	ug/g	ND			NC	40	
2,4,6-Trichlorophenol	ND	0.10	ug/g	ND			NC	40	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
2,4-Dichlorophenol	ND	0.10	ug/g	ND			NC	40	
2,4-Dimethylphenol	ND	0.10	ug/g	ND			NC	40	
2,4-Dinitrophenol	ND	0.10	ug/g	ND			NC	40	
2-Chlorophenol	ND	0.10	ug/g	ND			NC	40	
Pentachlorophenol	ND	0.10	ug/g	ND			NC	40	
Phenol	ND	0.10	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*0.603*		*%*		*82.9*	*50-140*			
Surrogate: Nitrobenzene-d5	*0.397*		*%*		*54.5*	*50-140*			
Surrogate: Terphenyl-d14	*0.695*		*%*		*95.4*	*50-140*			
Surrogate: 2,4,6-Tribromophenol	*1.37*		*%*		*93.9*	*50-140*			
Surrogate: 2-Fluorophenol	*2.00*		*%*		*138*	*50-140*			
Surrogate: Phenol-d6	*1.03*		*%*		*70.4*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g	ND			NC	50	
Benzene	ND	0.02	ug/g	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g	ND			NC	50	
Bromoform	ND	0.05	ug/g	ND			NC	50	
Bromomethane	ND	0.05	ug/g	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g	ND			NC	50	
Chloroform	ND	0.05	ug/g	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,2-Dichloropropane	ND	0.05	ug/g	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.05	ug/g	ND			NC	50	
Hexane	ND	0.05	ug/g	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g	ND			NC	50	
Styrene	ND	0.05	ug/g	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g	ND			NC	50	
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	*11.7*		*%*		*127*	*50-140*			
Surrogate: Dibromofluoromethane	*9.55*		*%*		*103*	*50-140*			
Surrogate: Toluene-d8	*11.4*		*%*		*123*	*50-140*			
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	*9.86*		*%*		*107*	*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)	198	7	ug/g	ND	99.1	85-115			
F2 PHCs (C10-C16)	91	4	ug/g	ND	87.9	60-140			
F3 PHCs (C16-C34)	229	8	ug/g	ND	90.1	60-140			
F4 PHCs (C34-C50)	156	6	ug/g	ND	97.0	60-140			
Metals									
Arsenic	47.2	1.0	ug/g	1.8	90.7	70-130			
Barium	127	1.0	ug/g	95.1	64.5	70-130			QS-02
Beryllium	48.9	0.5	ug/g	0.5	96.9	70-130			
Boron	50.2	5.0	ug/g	ND	91.6	70-130			
Cadmium	43.2	0.5	ug/g	ND	86.3	70-130			
Chromium (VI)	6.2	0.2	ug/g	1.3	73.0	70-130			
Chromium	82.4	5.0	ug/g	37.6	89.5	70-130			
Cobalt	53.9	1.0	ug/g	6.5	94.9	70-130			
Copper	61.3	5.0	ug/g	17.2	88.3	70-130			
Lead	48.6	1.0	ug/g	3.4	90.4	70-130			
Mercury	1.51	0.1	ug/g	ND	101	70-130			
Molybdenum	47.1	1.0	ug/g	ND	93.8	70-130			
Nickel	65.3	5.0	ug/g	20.6	89.5	70-130			
Selenium	45.7	1.0	ug/g	ND	91.2	70-130			
Silver	36.6	0.3	ug/g	ND	73.1	70-130			
Thallium	45.0	1.0	ug/g	ND	89.7	70-130			
Uranium	48.3	1.0	ug/g	ND	96.0	70-130			
Vanadium	77.0	10.0	ug/g	30.4	93.2	70-130			
Zinc	76.9	20.0	ug/g	36.7	80.4	70-130			
Semi-Volatiles									
1,2,4-Trichlorobenzene	0.34	0.05	ug/g	ND	93.3	50-140			
1-Methylnaphthalene	0.34	0.05	ug/g	ND	94.6	50-140			
2-Methylnaphthalene	0.33	0.05	ug/g	ND	91.9	50-140			
2,4-Dinitrotoluene	0.32	0.10	ug/g	ND	86.8	50-140			
2,6-Dinitrotoluene	0.32	0.10	ug/g	ND	88.7	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acenaphthene	0.28	0.05	ug/g	ND	77.8	50-140			
Acenaphthylene	0.26	0.05	ug/g	ND	70.2	50-140			
Anthracene	0.24	0.05	ug/g	ND	65.8	50-140			
Benzo [a] anthracene	0.32	0.05	ug/g	ND	89.0	50-140			
Benzo [a] pyrene	0.24	0.05	ug/g	ND	67.1	50-140			
Benzo [b] fluoranthene	0.30	0.05	ug/g	ND	83.7	50-140			
Benzo [g,h,i] perylene	0.29	0.05	ug/g	ND	79.1	50-140			
Benzo [k] fluoranthene	0.29	0.05	ug/g	ND	79.4	50-140			
Bis(2-chloroethyl)ether	0.20	0.10	ug/g	ND	53.6	50-140			
Bis(2-chloroisopropyl)ether	0.21	0.10	ug/g	ND	56.6	50-140			
Bis(2-ethylhexyl)phthalate	0.38	0.10	ug/g	ND	105	50-140			
Chrysene	0.31	0.05	ug/g	ND	86.3	50-140			
Diethylphthalate	0.28	0.10	ug/g	ND	78.2	50-140			
Dimethylphthalate	0.31	0.10	ug/g	ND	83.8	50-140			
Dibenzo [a,h] anthracene	0.30	0.10	ug/g	ND	82.9	50-140			
Fluoranthene	0.28	0.05	ug/g	ND	77.0	50-140			
Fluorene	0.28	0.05	ug/g	ND	75.8	50-140			
Indeno [1,2,3-cd] pyrene	0.32	0.05	ug/g	ND	87.0	50-140			
Naphthalene	0.29	0.05	ug/g	ND	80.8	50-140			
Phenanthrene	0.29	0.05	ug/g	ND	79.3	50-140			
Pyrene	0.35	0.05	ug/g	ND	96.9	50-140			
2,4,5-Trichlorophenol	0.32	0.10	ug/g	ND	89.1	50-140			
2,4,6-Trichlorophenol	0.35	0.10	ug/g	ND	95.2	50-140			
2,4-Dichlorophenol	0.35	0.10	ug/g	ND	95.0	50-140			
2,4-Dimethylphenol	0.36	0.10	ug/g	ND	99.9	30-130			
2,4-Dinitrophenol	0.33	0.10	ug/g	ND	90.9	50-140			
2-Chlorophenol	0.28	0.10	ug/g	ND	77.1	50-140			
Pentachlorophenol	0.38	0.10	ug/g	ND	103	50-140			
Phenol	0.22	0.10	ug/g	ND	59.8	30-130			
Surrogate: 2-Fluorobiphenyl	*0.612*		*%*		*84.0*	*50-140*			
Surrogate: Nitrobenzene-d5	*0.407*		*%*		*55.9*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*0.703*		*%*		*96.6*	*50-140*			
Surrogate: 2,4,6-Tribromophenol	*1.42*		*%*		*97.7*	*50-140*			
Surrogate: 2-Fluorophenol	*2.00*		*%*		*138*	*50-140*			
Surrogate: Phenol-d6	*1.05*		*%*		*72.1*	*50-140*			
Volatiles									
Acetone	11.1	0.50	ug/g	ND	111	50-140			
Benzene	4.47	0.02	ug/g	ND	112	60-130			
Bromodichloromethane	4.63	0.05	ug/g	ND	116	60-130			
Bromoform	4.51	0.05	ug/g	ND	113	60-130			
Bromomethane	4.49	0.05	ug/g	ND	112	50-140			
Carbon Tetrachloride	4.43	0.05	ug/g	ND	111	60-130			
Chlorobenzene	4.99	0.05	ug/g	ND	125	60-130			
Chloroform	4.55	0.05	ug/g	ND	114	60-130			
Dibromochloromethane	4.41	0.05	ug/g	ND	110	60-130			
Dichlorodifluoromethane	4.94	0.05	ug/g	ND	124	50-140			
1,2-Dichlorobenzene	4.83	0.05	ug/g	ND	121	60-130			
1,3-Dichlorobenzene	4.70	0.05	ug/g	ND	118	60-130			
1,4-Dichlorobenzene	4.66	0.05	ug/g	ND	117	60-130			
1,1-Dichloroethane	4.78	0.05	ug/g	ND	120	60-130			
1,2-Dichloroethane	4.56	0.05	ug/g	ND	114	60-130			
1,1-Dichloroethylene	4.63	0.05	ug/g	ND	116	60-130			
cis-1,2-Dichloroethylene	4.45	0.05	ug/g	ND	111	60-130			
trans-1,2-Dichloroethylene	4.50	0.05	ug/g	ND	112	60-130			
1,2-Dichloropropane	4.37	0.05	ug/g	ND	109	60-130			
cis-1,3-Dichloropropylene	3.89	0.05	ug/g	ND	97.2	60-130			
trans-1,3-Dichloropropylene	3.88	0.05	ug/g	ND	97.1	60-130			
Ethylbenzene	4.70	0.05	ug/g	ND	117	60-130			
Ethylene dibromide (dibromoethane, 1,2-)	4.53	0.05	ug/g	ND	113	60-130			
Hexane	3.96	0.05	ug/g	ND	99.0	60-130			
Methyl Ethyl Ketone (2-Butanone)	10.1	0.50	ug/g	ND	101	50-140			
Methyl Isobutyl Ketone	10.8	0.50	ug/g	ND	108	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methyl tert-butyl ether	10.7	0.05	ug/g	ND	107	50-140			
Methylene Chloride	4.62	0.05	ug/g	ND	116	60-130			
Styrene	4.41	0.05	ug/g	ND	110	60-130			
1,1,1,2-Tetrachloroethane	4.44	0.05	ug/g	ND	111	60-130			
1,1,2,2-Tetrachloroethane	3.99	0.05	ug/g	ND	99.7	60-130			
Tetrachloroethylene	4.57	0.05	ug/g	ND	114	60-130			
Toluene	4.88	0.05	ug/g	ND	122	60-130			
1,1,1-Trichloroethane	4.47	0.05	ug/g	ND	112	60-130			
1,1,2-Trichloroethane	4.57	0.05	ug/g	ND	114	60-130			
Trichloroethylene	4.42	0.05	ug/g	ND	111	60-130			
Trichlorofluoromethane	4.76	0.05	ug/g	ND	119	50-140			
Vinyl chloride	3.52	0.02	ug/g	ND	87.9	50-140			
m,p-Xylenes	9.27	0.05	ug/g	ND	116	60-130			
o-Xylene	4.70	0.05	ug/g	ND	117	60-130			
Surrogate: 4-Bromofluorobenzene	*7.74*		*%*		*96.7*	*50-140*			
Surrogate: Dibromofluoromethane	*8.14*		*%*		*102*	*50-140*			
Surrogate: Toluene-d8	*7.92*		*%*		*99.0*	*50-140*			
Benzene	4.08	0.02	ug/g	ND	102	60-130			
Ethylbenzene	4.17	0.05	ug/g	ND	104	60-130			
Toluene	3.73	0.05	ug/g	ND	93.3	60-130			
m,p-Xylenes	8.11	0.05	ug/g	ND	101	60-130			
o-Xylene	4.25	0.05	ug/g	ND	106	60-130			
Surrogate: Toluene-d8	*7.78*		*%*		*97.2*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

3: New vials submitted should have sample date of Jun 18th per client, not Jun 21st as noted on new coc.

Applies to Samples: BH3-24-SS5, BH5-24-SS2

QC Qualifiers:

QS-02 Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions:

None

Certificate of Analysis

Report Date: 26-Jun-2024

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

Order Date: 20-Jun-2024

Client PO: 60460

Project Description: PE6526

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.

Benzo[b]fluoranthene results may be biased high due to co-elution with Benzo[j]fluoranthene

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: 2425459

ent Blvd
C1G 4J8
@labs.com
.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2425459	

Client Name: Paterson	Project Ref: PE6526	Page 1 of 1
Contact Name: Karyn Munch	Quote #:	Turnaround Time
Address: 9 Auriga Drive	PO #: 60460	☐ 1 day ☐ 3 day
	E-mail: kmunch@patersongroup.ca cdecidder@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: (613)-226-7381		Date Required:

☒ REG 153/04 ☐ REG 406/19	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☒ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☐ No	☐ 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	Required Analysis: PHCs (F1-F4)	BTEX	Metals by ICP	Hg	Chromium VI	VOCs	pH	ABNs				
1	BH1-24-SS4	S	\	2	June 18/2024		✓		✓	✓	✓	✓		✓				
2	BH2-24-SS6	|	\	|	|		KEEP ON HOLD										
3	BH3-24-SS5	|	\	|	|		✓		✓	✓	✓	✓	✓	✓			
4	BH5-24-SS2	|	\	|	|		✓	✓	✓				✓				
5	DUP01	↓	\	↓	↓		✓		✓	✓	✓	✓		✓				
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): Carson de Ridder	Received at Depot:	Received at Lab: SS	Verified By: SD
Relinquished By (Print): Carson de Ridder	Date/Time:	Date/Time: 20 Jun 24 1458	Date/Time: June 20, 2024 4:37 pm
Date/Time: 06/18/2024	Temperature: °C	Temperature: 17.1	pH Verified: ☐ By:

PARACEL LABORATORIES LTD. | T R R

Paracel ID: 2425459

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2425459	

Client Name: Paterson
Contact Name: Karyn Munch
Address: 9 Auriga Drive
Telephone:

Project Ref: PE6526
Quote #:
PO #: [redacted] 60460
E-mail: kmunch@patersongroup.ca
cderidder@patersongroup.ca

Page 1 of 1

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required:

☒ REG 153/04 ☐ REG 406/19

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

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

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	ICP-Metals	Hg	CrVI	VOCs	pH	ABNs				
1	BH2-24-SS6 NEW	S	\	1	June 21 2024		ON HOLD											
2	BH3-24-SS5 NEW	↓	\	↓	↓		✓		✓	✓	✓	✓	✓	✓				
3	BH5-24-SS2 NEW	↓	\	↓	↓		✓	✓	✓				✓					
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments: Resampling of PO# 60460 since something happened to the vials above. labelled "NEW" for this reason. Thanks! - Carson.

Method of Delivery: Paracel Courier

Relinquished By (Sign): Carson de Ridder	Received at Depot:	Received at Lab: SD	Verified By: SD
Relinquished By (Print): Carson de Ridder	Date/Time:	Date/Time: June 21, 2024 3:05p	Date/Time: June 21, 2024 3:12p
Date/Time: 06/21/2024	Temperature: °C	Temperature: 11.3	pH Verified: ☐ By:

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Certificate of Analysis

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

Client PO: 60522
Project: PE6526
Custody: 70159

Report Date: 28-Jun-2024
Order Date: 25-Jun-2024

Order #: 2426251

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

Paracel ID	Client ID
2426251-01	BH1-24-GW1
2426251-02	BH3-24-GW1
2426251-03	DUP-June25

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - water	MOE E3056 - colourimetric	27-Jun-24	27-Jun-24
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	26-Jun-24	26-Jun-24
Metals, ICP-MS	EPA 200.8 - ICP-MS	27-Jun-24	28-Jun-24
PHC F1	CWS Tier 1 - P&T GC-FID	27-Jun-24	27-Jun-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	27-Jun-24	27-Jun-24
REG 153: ABNs + PAHs	based on SW-846 8270	27-Jun-24	28-Jun-24
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	27-Jun-24	27-Jun-24

Certificate of Analysis

Report Date: 28-Jun-2024

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

Order Date: 25-Jun-2024

Client PO: **60522**

Project Description: PE6526

	Client ID:	BH1-24-GW1	BH3-24-GW1	DUP-June25	-	-	-
	Sample Date:	25-Jun-24 09:00	25-Jun-24 09:00	25-Jun-24 09:00	-		
	Sample ID:	2426251-01	2426251-02	2426251-03	-		
	Matrix:	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	<0.5	<0.5	<0.5	-	-	-
Arsenic	1 ug/L	<1	<1	<1	-	-	-
Barium	1 ug/L	197	67	175	-	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Boron	10 ug/L	26	59	26	-	-	-
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	<0.5	0.8	<0.5	-	-	-
Copper	0.5 ug/L	2.2	0.7	0.8	-	-	-
Lead	0.1 ug/L	0.1	<0.1	<0.1	-	-	-
Molybdenum	0.5 ug/L	5.4	1.9	6.3	-	-	-
Nickel	1 ug/L	<1	3	<1	-	-	-
Selenium	1 ug/L	<1	<1	<1	-	-	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Sodium	200 ug/L	22200	77000	23400	-	-	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Uranium	0.1 ug/L	2.5	2.3	2.3	-	-	-
Vanadium	0.5 ug/L	0.7	0.8	0.7	-	-	-
Zinc	5 ug/L	<5	<5	<5	-	-	-
Volatiles							
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-

	Client ID:	BH1-24-GW1	BH3-24-GW1	DUP-June25	-	-	-
	Sample Date:	25-Jun-24 09:00	25-Jun-24 09:00	25-Jun-24 09:00	-		
	Sample ID:	2426251-01	2426251-02	2426251-03	-		
	Matrix:	Ground Water	Ground Water	Ground Water	-		
	MDL/Units						
Volatiles							
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Ethylene dibromide (dibromoethane,	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-	-	-

Certificate of Analysis

Report Date: 28-Jun-2024

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

Order Date: 25-Jun-2024

Client PO: **60522**

Project Description: **PE6526**

	Client ID:	BH1-24-GW1	BH3-24-GW1	DUP-June25	-	-	-
	Sample Date:	25-Jun-24 09:00	25-Jun-24 09:00	25-Jun-24 09:00	-		
	Sample ID:	2426251-01	2426251-02	2426251-03	-		
	Matrix:	Ground Water	Ground Water	Ground Water	-		
	MDL/Units						
Volatiles							
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Toluene-d8	Surrogate	118%	117%	113%	-	-	-
4-Bromofluorobenzene	Surrogate	117%	119%	114%	-	-	-
Dibromofluoromethane	Surrogate	97.7%	98.3%	99.0%	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-	-	-
Semi-Volatiles							
1-Methylnaphthalene	1 ug/L	<1	<1	<1	-	-	-
1,2,4-Trichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-

Certificate of Analysis

Report Date: 28-Jun-2024

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

Order Date: 25-Jun-2024

Client PO: **60522**

Project Description: **PE6526**

	Client ID:	BH1-24-GW1	BH3-24-GW1	DUP-June25	-		
	Sample Date:	25-Jun-24 09:00	25-Jun-24 09:00	25-Jun-24 09:00	-	-	-
	Sample ID:	2426251-01	2426251-02	2426251-03	-		
	Matrix:	Ground Water	Ground Water	Ground Water	-		
	MDL/Units						
Semi-Volatiles							
2,4-Dinitrotoluene	2 ug/L	<2	<2	<2	-	-	-
2,6-Dinitrotoluene	2 ug/L	<2	<2	<2	-	-	-
Dinitrotoluene (2,4 & 2,6)	3 ug/L	<3	<3	<3	-	-	-
2-Methylnaphthalene	1 ug/L	<1	<1	<1	-	-	-
Methylnaphthalene (1&2)	1 ug/L	<1	<1	<1	-	-	-
3,3'-Dichlorobenzidine	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
4-Chloroaniline	10 ug/L	<10	<10	<10	-	-	-
Acenaphthene	1 ug/L	<1	<1	<1	-	-	-
Anthracene	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Acenaphthylene	1 ug/L	<1	<1	<1	-	-	-
Benzo [a] anthracene	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	-	-	-
Benzo [g,h,i] perylene	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
Benzo [b] fluoranthene	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Benzo [k] fluoranthene	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Biphenyl	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Bis(2-chloroethyl)ether	5 ug/L	<5	<5	<5	-	-	-
Bis(2-chloroisopropyl)ether	4 ug/L	<4	<4	<4	-	-	-
Bis(2-ethylhexyl)phthalate	10 ug/L	<10	<10	<10	-	-	-
Chrysene	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Dibenzo [a,h] anthracene	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
Diethylphthalate	2 ug/L	<2	<2	<2	-	-	-
Dimethylphthalate	2 ug/L	<2	<2	<2	-	-	-
Fluoranthene	0.4 ug/L	<0.4	<0.4	<0.4	-	-	-
Fluorene	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-

	Client ID:	BH1-24-GW1	BH3-24-GW1	DUP-June25	-		
	Sample Date:	25-Jun-24 09:00	25-Jun-24 09:00	25-Jun-24 09:00	-	-	-
	Sample ID:	2426251-01	2426251-02	2426251-03	-		
	Matrix:	Ground Water	Ground Water	Ground Water	-		
	MDL/Units						
Semi-Volatiles							
Indeno [1,2,3-cd] pyrene	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
Naphthalene	2 ug/L	<2	<2	<2	-	-	-
Phenanthrene	0.1 ug/L	<0.1	<0.1	<0.1	-	-	-
Pyrene	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
2,4,5-Trichlorophenol	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
2,4,6-Trichlorophenol	0.2 ug/L	<0.2	<0.2	<0.2	-	-	-
2,4-Dichlorophenol	20 ug/L	<20	<20	<20	-	-	-
2,4-Dimethylphenol	10 ug/L	<10	<10	<10	-	-	-
2,4-Dinitrophenol	10 ug/L	<10	<10	<10	-	-	-
2-Chlorophenol	2 ug/L	<2	<2	<2	-	-	-
Pentachlorophenol	0.5 ug/L	<0.5	<0.5	<0.5	-	-	-
Phenol	1 ug/L	<1	<1	<1	-	-	-
2-Fluorobiphenyl	Surrogate	95%	94%	97%	-	-	-
Nitrobenzene-d5	Surrogate	102%	93%	101%	-	-	-
Terphenyl-d14	Surrogate	97%	99%	98%	-	-	-
2,4,6-Tribromophenol	Surrogate	122%	119%	120%	-	-	-
2-Fluorophenol	Surrogate	43%	40% [2]	41%	-	-	-
Phenol-d6	Surrogate	46%	41%	44%	-	-	-

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								
1-Methylnaphthalene	ND	1	ug/L					
1,2,4-Trichlorobenzene	ND	0.5	ug/L					
2,4-Dinitrotoluene	ND	2	ug/L					
2,6-Dinitrotoluene	ND	2	ug/L					
Dinitrotoluene (2,4 & 2,6)	ND	3	ug/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
2-Methylnaphthalene	ND	1	ug/L					
Methylnaphthalene (1&2)	ND	1	ug/L					
3,3´-Dichlorobenzidine	ND	0.5	ug/L					
4-Chloroaniline	ND	10	ug/L					
Acenaphthene	ND	1	ug/L					
Anthracene	ND	0.1	ug/L					
Acenaphthylene	ND	1	ug/L					
Benzo [a] anthracene	ND	0.2	ug/L					
Benzo [a] pyrene	ND	0.01	ug/L					
Benzo [g,h,i] perylene	ND	0.2	ug/L					
Benzo [b] fluoranthene	ND	0.1	ug/L					
Benzo [k] fluoranthene	ND	0.1	ug/L					
Biphenyl	ND	0.5	ug/L					
Bis(2-chloroethyl)ether	ND	5	ug/L					
Bis(2-chloroisopropyl)ether	ND	4	ug/L					
Bis(2-ethylhexyl)phthalate	ND	10	ug/L					
Chrysene	ND	0.1	ug/L					
Dibenzo [a,h] anthracene	ND	0.2	ug/L					
Diethylphthalate	ND	2	ug/L					
Dimethylphthalate	ND	2	ug/L					
Fluoranthene	ND	0.4	ug/L					
Fluorene	ND	0.5	ug/L					
Indeno [1,2,3-cd] pyrene	ND	0.2	ug/L					
Naphthalene	ND	2	ug/L					
Phenanthrene	ND	0.1	ug/L					
Pyrene	ND	0.2	ug/L					
2,4,5-Trichlorophenol	ND	0.2	ug/L					
2,4,6-Trichlorophenol	ND	0.2	ug/L					
2,4-Dichlorophenol	ND	20	ug/L					
2,4-Dimethylphenol	ND	10	ug/L					
2,4-Dinitrophenol	ND	10	ug/L					
2-Chlorophenol	ND	2	ug/L					
Pentachlorophenol	ND	0.5	ug/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Phenol	ND	1	ug/L					
Surrogate: 2-Fluorobiphenyl	*9.39*		*%*	*93.9*	*50-140*			
Surrogate: Nitrobenzene-d5	*9.17*		*%*	*91.7*	*40-140*			
Surrogate: Terphenyl-d14	*10.7*		*%*	*107*	*50-140*			
Surrogate: 2,4,6-Tribromophenol	*8.00*		*%*	*80.0*	*40-140*			
Surrogate: 2-Fluorophenol	*4.04*		*%*	*40.4*	*40-140*			
Surrogate: Phenol-d6	*2.99*		*%*	*29.9*	*40-140*			S-GC
Volatiles								
Acetone	ND	5.0	ug/L					
Benzene	ND	0.5	ug/L					
Bromodichloromethane	ND	0.5	ug/L					
Bromoform	ND	0.5	ug/L					
Bromomethane	ND	0.5	ug/L					
Carbon Tetrachloride	ND	0.2	ug/L					
Chlorobenzene	ND	0.5	ug/L					
Chloroform	ND	0.5	ug/L					
Dibromochloromethane	ND	0.5	ug/L					
Dichlorodifluoromethane	ND	1.0	ug/L					
1,2-Dichlorobenzene	ND	0.5	ug/L					
1,3-Dichlorobenzene	ND	0.5	ug/L					
1,4-Dichlorobenzene	ND	0.5	ug/L					
1,1-Dichloroethane	ND	0.5	ug/L					
1,2-Dichloroethane	ND	0.5	ug/L					
1,1-Dichloroethylene	ND	0.5	ug/L					
cis-1,2-Dichloroethylene	ND	0.5	ug/L					
trans-1,2-Dichloroethylene	ND	0.5	ug/L					
1,2-Dichloropropane	ND	0.5	ug/L					
cis-1,3-Dichloropropylene	ND	0.5	ug/L					
trans-1,3-Dichloropropylene	ND	0.5	ug/L					
1,3-Dichloropropene, total	ND	0.5	ug/L					
Ethylbenzene	ND	0.5	ug/L					
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.2	ug/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Hexane	ND	1.0	ug/L					
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L					
Methyl Isobutyl Ketone	ND	5.0	ug/L					
Methyl tert-butyl ether	ND	2.0	ug/L					
Methylene Chloride	ND	5.0	ug/L					
Styrene	ND	0.5	ug/L					
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L					
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L					
Tetrachloroethylene	ND	0.5	ug/L					
Toluene	ND	0.5	ug/L					
1,1,1-Trichloroethane	ND	0.5	ug/L					
1,1,2-Trichloroethane	ND	0.5	ug/L					
Trichloroethylene	ND	0.5	ug/L					
Trichlorofluoromethane	ND	1.0	ug/L					
Vinyl chloride	ND	0.5	ug/L					
m,p-Xylenes	ND	0.5	ug/L					
o-Xylene	ND	0.5	ug/L					
Xylenes, total	ND	0.5	ug/L					
Surrogate: 4-Bromofluorobenzene	*94.7*		*%*	*118*	*50-140*			
Surrogate: Dibromofluoromethane	*75.8*		*%*	*94.8*	*50-140*			
Surrogate: Toluene-d8	*94.0*		*%*	*118*	*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	1.00	0.1	ug/L	1.00			0.2	20	
Antimony	ND	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	ND	1	ug/L	ND			NC	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	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	ND	0.5	ug/L	0.51			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	ND	0.5	ug/L	ND			NC	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	ND	200	ug/L	ND			NC	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									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	5.54	0.5	ug/L	4.05			31.1	30	QR-07
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	11.7	0.5	ug/L	7.75			40.5	30	QR-07
Dibromochloromethane	3.47	0.5	ug/L	2.83			20.3	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*99.0*		*%*		*124*	*50-140*			
Surrogate: Dibromofluoromethane	*77.4*		*%*		*96.8*	*50-140*			
Surrogate: Toluene-d8	*94.9*		*%*		*119*	*50-140*			

Method Quality Control: LCS Dup

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
1-Methylnaphthalene	8.1	1	ug/L	ND	81.3	50-140	4.07	200	
1,2,4-Trichlorobenzene	6.5	0.5	ug/L	ND	65.5	50-140	6.89	200	
2,4-Dinitrotoluene	10.5	2	ug/L	ND	105	50-140	3.42	200	
2,6-Dinitrotoluene	11.3	2	ug/L	ND	113	50-140	3.27	200	
2-Methylnaphthalene	8.0	1	ug/L	ND	79.9	50-140	5.00	200	
3,3´-Dichlorobenzidine	9.4	0.5	ug/L	ND	92.6	30-130	1.00	200	
Acenaphthene	8.7	1	ug/L	ND	87.3	50-140	2.48	200	
Anthracene	8.4	0.1	ug/L	ND	84.0	50-140	1.70	200	
Acenaphthylene	9.6	1	ug/L	ND	95.9	50-140	2.21	200	
Benzo [a] anthracene	10.2	0.2	ug/L	ND	102	50-140	2.46	200	
Benzo [a] pyrene	9.2	0.01	ug/L	ND	91.7	50-140	4.42	200	
Benzo [g,h,i] perylene	10.0	0.2	ug/L	ND	100	50-140	4.39	200	
Benzo [b] fluoranthene	10.6	0.1	ug/L	ND	106	50-140	2.00	200	
Benzo [k] fluoranthene	10.3	0.1	ug/L	ND	103	50-140	6.13	200	
Bis(2-chloroethyl)ether	10.5	5	ug/L	ND	105	50-140	0.978	200	
Bis(2-chloroisopropyl)ether	9.8	4	ug/L	ND	97.7	50-140	6.84	200	
Chrysene	9.9	0.1	ug/L	ND	98.6	50-140	0.466	200	
Dibenzo [a,h] anthracene	10.1	0.2	ug/L	ND	101	50-140	2.61	200	
Diethylphthalate	10.9	2	ug/L	ND	109	50-140	2.91	200	
Dimethylphthalate	9.6	2	ug/L	ND	96.3	50-140	3.75	200	
Fluoranthene	10.0	0.4	ug/L	ND	100	50-140	3.16	200	
Fluorene	9.4	0.5	ug/L	ND	93.7	50-140	2.40	200	
Indeno [1,2,3-cd] pyrene	10.8	0.2	ug/L	ND	108	50-140	2.10	200	
Naphthalene	8.1	2	ug/L	ND	80.7	50-140	3.40	200	
Phenanthrene	9.8	0.1	ug/L	ND	97.9	50-140	2.63	200	
Pyrene	10.2	0.2	ug/L	ND	102	50-140	1.44	200	
2,4,5-Trichlorophenol	11.2	0.2	ug/L	ND	112	50-140	4.57	200	
2,4,6-Trichlorophenol	10.8	0.2	ug/L	ND	108	50-140	5.68	200	
2,4-Dinitrophenol	188	10	ug/L	ND	118	30-130	6.86	200	
2-Chlorophenol	8.5	2	ug/L	ND	85.3	50-140	3.68	200	

Method Quality Control: LCS Dup

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Pentachlorophenol	10.7	0.5	ug/L	ND	107	50-140	9.43	200	
Phenol	3.5	1	ug/L	ND	35.0	30-130	2.76	200	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1890	25	ug/L	ND	94.3	85-115			
F2 PHCs (C10-C16)	1320	100	ug/L	ND	82.2	60-140			
F3 PHCs (C16-C34)	3320	100	ug/L	ND	84.6	60-140			
F4 PHCs (C34-C50)	1760	100	ug/L	ND	71.0	60-140			
Metals									
Mercury	3.64	0.1	ug/L	1.00	88.0	70-130			
Arsenic	47.8	1	ug/L	ND	95.6	80-120			
Barium	49.4	1	ug/L	ND	98.8	80-120			
Beryllium	52.3	0.5	ug/L	ND	105	80-120			
Boron	48	10	ug/L	ND	95.2	80-120			
Cadmium	51.0	0.1	ug/L	ND	102	80-120			
Chromium (VI)	187	10	ug/L	ND	93.5	70-130			
Chromium	49.7	1	ug/L	ND	99.3	80-120			
Cobalt	49.0	0.5	ug/L	ND	97.9	80-120			
Copper	48.2	0.5	ug/L	0.51	95.4	80-120			
Lead	46.5	0.1	ug/L	ND	92.9	80-120			
Molybdenum	42.6	0.5	ug/L	ND	84.9	80-120			
Nickel	48.6	1	ug/L	ND	97.1	80-120			
Selenium	45.6	1	ug/L	ND	91.1	80-120			
Silver	49.9	0.1	ug/L	ND	99.9	80-120			
Sodium	9800	200	ug/L	ND	97.8	80-120			
Thallium	46.8	0.1	ug/L	ND	93.5	80-120			
Uranium	47.6	0.1	ug/L	ND	95.1	80-120			
Vanadium	49.8	0.5	ug/L	ND	99.7	80-120			
Zinc	49	5	ug/L	ND	97.1	80-120			
Semi-Volatiles									
1-Methylnaphthalene	7.8	1	ug/L	ND	78.0	50-140			
1,2,4-Trichlorobenzene	6.1	0.5	ug/L	ND	61.1	50-140			
2,4-Dinitrotoluene	10.2	2	ug/L	ND	102	50-140			
2,6-Dinitrotoluene	11.0	2	ug/L	ND	110	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
2-Methylnaphthalene	7.6	1	ug/L	ND	76.0	50-140			
3,3´-Dichlorobenzidine	9.3	0.5	ug/L	ND	91.6	30-130			
Acenaphthene	8.5	1	ug/L	ND	85.2	50-140			
Anthracene	8.3	0.1	ug/L	ND	82.6	50-140			
Acenaphthylene	9.4	1	ug/L	ND	93.8	50-140			
Benzo [a] anthracene	10.0	0.2	ug/L	ND	99.7	50-140			
Benzo [a] pyrene	8.8	0.01	ug/L	ND	87.7	50-140			
Benzo [g,h,i] perylene	9.6	0.2	ug/L	ND	95.8	50-140			
Benzo [b] fluoranthene	10.4	0.1	ug/L	ND	104	50-140			
Benzo [k] fluoranthene	9.6	0.1	ug/L	ND	96.4	50-140			
Bis(2-chloroethyl)ether	10.4	5	ug/L	ND	104	50-140			
Bis(2-chloroisopropyl)ether	10.5	4	ug/L	ND	105	50-140			
Chrysene	9.9	0.1	ug/L	ND	99.0	50-140			
Dibenzo [a,h] anthracene	9.8	0.2	ug/L	ND	98.3	50-140			
Diethylphthalate	10.5	2	ug/L	ND	105	50-140			
Dimethylphthalate	10.0	2	ug/L	ND	99.9	50-140			
Fluoranthene	9.7	0.4	ug/L	ND	97.3	50-140			
Fluorene	9.1	0.5	ug/L	ND	91.5	50-140			
Indeno [1,2,3-cd] pyrene	10.6	0.2	ug/L	ND	106	50-140			
Naphthalene	7.8	2	ug/L	ND	78.0	50-140			
Phenanthrene	9.5	0.1	ug/L	ND	95.4	50-140			
Pyrene	10.1	0.2	ug/L	ND	101	50-140			
2,4,5-Trichlorophenol	10.7	0.2	ug/L	ND	107	50-140			
2,4,6-Trichlorophenol	10.2	0.2	ug/L	ND	102	50-140			
2,4-Dinitrophenol	176	10	ug/L	ND	110	30-130			
2-Chlorophenol	8.2	2	ug/L	ND	82.2	50-140			
Pentachlorophenol	9.7	0.5	ug/L	ND	97.0	50-140			
Phenol	3.6	1	ug/L	ND	36.0	30-130			
Surrogate: 2-Fluorobiphenyl	*9.47*		*%*		*94.7*	*50-140*			
Surrogate: Nitrobenzene-d5	*11.0*		*%*		*110*	*40-140*			
Surrogate: Terphenyl-d14	*9.55*		*%*		*95.5*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: 2,4,6-Tribromophenol	*12.4*		*%*		*124*	*40-140*			
Surrogate: 2-Fluorophenol	*4.16*		*%*		*41.6*	*40-140*			
Surrogate: Phenol-d6	*2.59*		*%*		*25.9*	*40-140*			*S-GC*
Volatiles									
Acetone	71.4	5.0	ug/L	ND	71.4	50-140			
Benzene	30.4	0.5	ug/L	ND	76.1	60-130			
Bromodichloromethane	35.0	0.5	ug/L	ND	87.5	60-130			
Bromoform	33.5	0.5	ug/L	ND	83.7	60-130			
Bromomethane	34.0	0.5	ug/L	ND	85.1	50-140			
Carbon Tetrachloride	30.0	0.2	ug/L	ND	75.1	60-130			
Chlorobenzene	36.1	0.5	ug/L	ND	90.4	60-130			
Chloroform	30.2	0.5	ug/L	ND	75.5	60-130			
Dibromochloromethane	34.4	0.5	ug/L	ND	85.9	60-130			
Dichlorodifluoromethane	32.4	1.0	ug/L	ND	80.9	50-140			
1,2-Dichlorobenzene	32.9	0.5	ug/L	ND	82.2	60-130			
1,3-Dichlorobenzene	32.9	0.5	ug/L	ND	82.3	60-130			
1,4-Dichlorobenzene	34.7	0.5	ug/L	ND	86.8	60-130			
1,1-Dichloroethane	30.4	0.5	ug/L	ND	76.1	60-130			
1,2-Dichloroethane	35.7	0.5	ug/L	ND	89.3	60-130			
1,1-Dichloroethylene	37.2	0.5	ug/L	ND	93.1	60-130			
cis-1,2-Dichloroethylene	36.0	0.5	ug/L	ND	90.0	60-130			
trans-1,2-Dichloroethylene	29.5	0.5	ug/L	ND	73.7	60-130			
1,2-Dichloropropane	36.3	0.5	ug/L	ND	90.8	60-130			
cis-1,3-Dichloropropylene	34.9	0.5	ug/L	ND	87.2	60-130			
trans-1,3-Dichloropropylene	33.3	0.5	ug/L	ND	83.2	60-130			
Ethylbenzene	32.9	0.5	ug/L	ND	82.3	60-130			
Ethylene dibromide (dibromoethane, 1,2-)	33.2	0.2	ug/L	ND	83.0	60-130			
Hexane	39.6	1.0	ug/L	ND	99.0	60-130			
Methyl Ethyl Ketone (2-Butanone)	87.4	5.0	ug/L	ND	87.4	50-140			
Methyl Isobutyl Ketone	98.5	5.0	ug/L	ND	98.5	50-140			
Methyl tert-butyl ether	84.3	2.0	ug/L	ND	84.3	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	36.8	5.0	ug/L	ND	92.0	60-130			
Styrene	34.6	0.5	ug/L	ND	86.5	60-130			
1,1,1,2-Tetrachloroethane	36.7	0.5	ug/L	ND	91.7	60-130			
1,1,2,2-Tetrachloroethane	30.2	0.5	ug/L	ND	75.4	60-130			
Tetrachloroethylene	38.8	0.5	ug/L	ND	97.0	60-130			
Toluene	35.1	0.5	ug/L	ND	87.8	60-130			
1,1,1-Trichloroethane	29.6	0.5	ug/L	ND	74.0	60-130			
1,1,2-Trichloroethane	31.1	0.5	ug/L	ND	77.7	60-130			
Trichloroethylene	45.6	0.5	ug/L	ND	114	60-130			
Trichlorofluoromethane	36.1	1.0	ug/L	ND	90.3	60-130			
Vinyl chloride	36.0	0.5	ug/L	ND	90.1	50-140			
m,p-Xylenes	64.5	0.5	ug/L	ND	80.7	60-130			
o-Xylene	32.3	0.5	ug/L	ND	80.8	60-130			
Surrogate: 4-Bromofluorobenzene	*82.6*		*%*		*103*	*50-140*			
Surrogate: Dibromofluoromethane	*78.9*		*%*		*98.6*	*50-140*			
Surrogate: Toluene-d8	*83.9*		*%*		*105*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

2: Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
Applies to Samples: BH3-24-GW1

QC Qualifiers:

QR-07 Duplicate result exceeds RPD limits due to non-homogeneity between multiple sample vials. Remainder of QA/QC is acceptable.

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

Sample Data Revisions:

None

Certificate of Analysis

Report Date: 28-Jun-2024

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

Order Date: 25-Jun-2024

Client PO: 60522

Project Description: PE6526

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

Benzo[b]fluoranthene results may be biased high due to co-elution with Benzo[j]fluoranthene

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: 2426251

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2426 251	№ 70159

Client Name: Karyn Munch	Project Ref: PE6526	Page 1 of 1
Contact Name: Paterson Group	Quote #:	Turnaround Time
Address: 9 Auriga Dr.	PO #: 60522	☐ 1 day ☐ 3 day
	E-mail: Kmunch@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

☒ REG 153/04 ☐ REG 406/19	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☒ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table	Mun:
For RSC: ☒ Yes ☐ No	☐ 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	Required Analysis: PHCs + BTEX	ICP Metals	Hg	CrVI	VOCs	ABNs						
1	BH1-24-GW1	GW		7	June 25/24	am	X	X	X	X	X	✓						
2	BH3-24-GW1	↓		↓	↓	↓	X	X	X	X	X	X						
3	DUP-June 25	↓		↓	↓	↓	X	X	X	X	✓	X						
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): DC Latta	Received By Driver/Depot:	Received at Lab: SS	Verified By: SS
Relinquished By (Print): Derek Lattin	Date/Time:	Date/Time: 25 Jun 24 1640	Date/Time: 26 Jun 24 1036
Date/Time: June 25 2024	Temperature: °C	Temperature: 21.3 °C	pH Verified: ☑ By: SS