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Phase II Environmental Site Assessment

5505 & 5545 Albion Road
Ottawa, Ontario

Prepared For

W.O. Stinson & Son Ltd.

October 9, 2020

Report: PE4169-2

Paterson Group Inc.

Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the properties addressed 5505 and 5545 Albion Road, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address the areas of potential environmental concern (APECs) that were identified on the Phase II Property during the Phase I ESA.

An initial subsurface investigation (Phase II ESA) was completed by Pinchin in 2017. Their results identified PHC and BTEX impacted soil and groundwater in the immediate vicinity of the UST nest and former pump island. Subsequently, a site remediation and UST decommissioning program was undertaken in 2017 by Paterson. Confirmatory soil and groundwater samples indicated that the site conditions in the immediate area of the excavation were in compliance with the selected MECP Table 2 Industrial Standards.

The more recent subsurface program consisted of drilling ten (10) boreholes on the Phase II Property, four (4) of which were constructed with groundwater monitoring well installations.

Soil samples were obtained from the boreholes and screened using vapour measurements along with visual and olfactory observations. Based on the screening results in combination with sample depth and location, a total of six (6) soil samples were submitted for BTEX, PHC (fractions 1 to 4), PHCs and/or metal analyses. All soil results are in compliance of the selected MECP Table 2 Industrial Standards.

Groundwater samples were recovered from four (4) of the monitoring wells. No free-phase product was observed during the groundwater sampling event. The groundwater samples were submitted for PHC (F1-F4), BTEX and/or VOC analyses. All groundwater results, with the exception of ethylbenzene from BH2, are in compliance with the selected MECP Table 2 Standards.

The ethylbenzene impact is considered to be isolated in the immediate area of the former pump island in shallow groundwater and not expected to have migrated into the deep aquifer. It is our opinion that this impacted groundwater at BH2 is not considered to pose a risk to the current and/or future use of the Phase II Property or the neighbouring lands as the ethylbenzene concentration (marginally in excess of Table 2) will naturally attenuate over time.

Recommendations

It is recommended that the monitoring wells on-site be properly abandoned if they are not going to be used in the future. They should be abandoned according to Ontario Regulation 903. The wells will be registered with the MECP under this regulation.

1.0 INTRODUCTION

At the request of W.O. Stinson & Son Ltd., Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment for the properties addressed 5505 and 5545 Albion Road, in the City of Ottawa, Ontario, herein referred to as the Phase II Property. The purpose of this Phase II ESA was to address areas of potential environmental concern (APECs) identified on the Phase II Property, during the Phase I ESA conducted by Paterson.

1.1 Site Description

Address:	5505 and 5545 Albion Road, in Ottawa Ontario.
Location:	The site is located on the northeast corner of the intersection of Albion Road and Mitch Owens Road, in the City of Ottawa, Ontario. For the purpose of this assessment, Mitch Owens Road is assumed to run in an east-west direction. Refer to Figure 1 - Key Plan in the Figures section following the text.
Legal Description:	Part of Lot 30, Concession 4 from Rideau River, now in the City of Ottawa.
Latitude and Longitude:	45°16’ 16.45" N, 75° 35' 38.22" W
Zoning:	RU – Rural Countryside Zone RH – Rural Heavy Industrial Zone
Configuration:	Irregular
Area:	36,180m^2 (approximately)

1.2 Property Ownership

Paterson was engaged to conduct this Phase II-ESA by Mr. John Armstrong, of W.O. Stinson & Son Ltd. The head office of W.O. Stinson & Son Ltd. is located at 1187 Bank Street, Ottawa, Ontario. Mr. Armstrong can be reached by telephone at (613) 226-7381.

1.3 Current and Proposed Future Uses

The Phase II Property is currently vacant land that was formerly used for industrial purpose.

It is our understanding that the Phase II Property will be redeveloped with a slab-on-grade building that will be used for industrial purposes.

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 selected MECP Table 2 Standards are based on the following considerations:

- ❑ Coarse-grained soil conditions
- ❑ Full depth generic site condition
- ❑ Potable groundwater conditions
- ❑ Industrial land use

Section 35 of O.Reg. 153/04 does not apply to the Phase II Property in that the property relies upon private services (i.e. potable water well).

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

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

The intended use of the Phase II ESA property is industrial; therefore, the Industrial Standards have been selected for the purpose of this Phase II ESA.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is situated in a rural area that relies upon private water and septic system. The southern portion of the Phase II Property is partially gravelled with an asphaltic concrete paved area fronting Albion Road and Mitch Owens

Road. Ground coverage on the northern portion of the site is somewhat gravelled with some evidence of fill material ad sparce vegetation/brush.

Site drainage consisting of infiltration on the gravelled and vegetated areas and sheetflow on the paved areas. The site is relatively flat and at the grade of Albion Road and Mitch Owens Road with a slight down slope towards the southwest/west. The regional topography slopes down in a westerly direction towards the Rideau River.

2.2 Past Investigations

A Phase II ESA was completed by Pinchin in September 2017 and consisted of drilling eight (8) boreholes on the subject site, all of which were completed as groundwater monitoring wells. Four (4) boreholes were placed along the east (MW-1 and MW-2) and west (MW-3 and MW-4) sides of the UST nest; one on the east side of the pump island (MW-5); one in the immediate area of the point of discharge of the garage drain on the central west side of the property (MW-6); and two (2) in the truck repair building (MW-7 and MW-8) to address the potential concerns.

Soil and groundwater samples were collected and submitted for laboratory analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), petroleum hydrocarbons (PHCs) fractions F1-F4 and/or volatile organic compounds (VOCs). Analytical results were compared to the applicable MECP Table 2 Industrial Standards for potable water.

Based on the analytical test results, VOC and PHC concentrations in soil and groundwater at MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8 were in compliance of the selected MECP Standards. The soil and groundwater samples collected from MW-1 and MW-5, situated in the immediate area between the USTs and a pump island, were in excess of the applicable standards. Based on these results, the soil and groundwater impacts were related the former PFO and there was no impact related to the former truck repair shop.

An environmental remediation and tank decommissioning program was completed by Paterson Group Inc. (Paterson) in November of 2017. The program included the removal of petroleum hydrocarbon impacted soil and groundwater, and the removal of the three (3) onsite USTs and associated pump island and underground piping. In total, 659 metric tonnes of soil were removed off-site. A total of 58,000 L of groundwater was removed from the excavation and either disposed of at Clean Water Works or remediated on-site. The source of the

petroleum release was determined to be the underground piping connecting the USTs to the pump islands.

Following the removal of impacted soil, confirmatory soil and groundwater samples were submitted for laboratory analysis of BTEX and PHCs. All final confirmatory samples were either non-detect or contained trace levels of BTEX and/or PHC concentrations in compliance with the selected MECP Standards.

Based on 2017 Phase II ESA conducted by Pinchin in combination with the remedial work completed by Paterson, it is our opinion that the potential impact of the former truck repair shop and former private fuel outlet on-site have been adequately addressed and as such, these on-site potentially contaminated activities (PCAs) are no longer considered to represent areas of potential environmental concern (APECs) on the Phase I Property.

A Phase I-ESA was conducted by Paterson in September of 2020 in general accordance with the Ontario Regulation (O.Reg.) 153/04, as amended. The Phase I ESA identified the following PCAs that resulted in APECs on the Phase I Property:

- PCA 30 – "*Importation of Fill Material of Unknown Quality,"* associated with importation of fill material of an unknown quality on the Phase I Property (APEC 1).
- PCA 28 – *"Gasoline and Associated Products Storage in Fixed Tanks,"* associated with the current off-site retail fuel outlet (McEwan) 5546 Albion Road (APEC 2).

A Phase II ESA was recommended to address the aforementioned PCAs that resulted in APECs on the Phase I Property.

This report contains the analytical findings of the 2017 Phase II ESA competed by Pinchin, with the exception of the soil and groundwater results in the approximate area of remediation excavation, and the current subsurface program.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was conducted during the interim of September 1 to September 3, 2020. The field program consisted of drilling ten (10) boreholes, four (4) which were instrumented with groundwater monitoring wells. The boreholes were drilled to a maximum depth of 5.18 m below the ground surface (mbgs).

3.2 Media Investigated

During the subsurface investigation, soil samples and groundwater samples were obtained and submitted for laboratory analysis. The rationale for sampling and analyzing this media is based on the Contaminants of Potential Concern (CPCs) identified in the Phase I ESA. These CPCs include benzene, ethylbenzene, toluene and xylenes (BTEX), petroleum hydrocarbons (PHC, F_1-F_4), Volatile Organic Compounds (VOCs) and/or metals in soil and/or groundwater.

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

According to the Geological Survey of Canada website, the bedrock in the area of the Phase I Property is reported to consist of dolomite bedrock of the Oxford Formation. The overburden thickness of ranges from 10 to 25 m and consists of nearshore marine sediments (reworked glacial till).

Groundwater is expected to flow in a westerly direction towards the Rideau River.

Existing Buildings and Structures

The southern portion of the Phase I Property is occupied by two (2) concrete slab foundations/remnants of the former on-site buildings that were originally constructed in 1972. The south-eastern side of the property is occupied by two (2) sea containers, while the remaining Phase I Property is vacant.

Areas of Natural Significance and Water Bodies

No areas of natural significance or water bodies were identified on the Phase I Property or within the Phase I Study Area.

Neighbouring Land Use

The Phase I Property is situated in a rural development area that consists of both commercial and residential land use.

Subsurface Structures and Utilities

The Phase I Property is situated in a rural area where private services are relied upon (septic system and potable water well). The private well was noted on the southeastern side of the property. An underground hydroelectricity line was noted on the southern portion of the Phase I Property located next to the former truck repair garage/shop. All underground structures associated with the former private fuel outlet (USTs and ancillary equipment) were excavated and removed in 2017. These former underground structures are no longer considered a source of potential contamination.

Drinking Water Wells

One potable water well was identified on the southeastern side of the Phase I Property.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Section 7.2 of the Phase I ESA report, two (2) PCAs were considered to result in APECs on the Phase I Property. These APECs have been summarized in Table 1, along with their respective location and contaminants of potential concern (CPCs) on the Phase I Property.

TABLE 1: Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	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: Resulting from the importation of fill material of unknown quality	Entire Phase I Property	PCA 30 – "*Importation of Fill Material of Unknown Quality,*"	On-site	BTEXs PHCs Metals	Soil and/or groundwater

TABLE 1: Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 2: Resulting from the presence of a retail fuel outlet.	Southwest side of the Phase I Property	PCA 28 – *"Gasoline and Associated Products Storage in Fixed Tanks,"*	Off-site	BTEX PHCs (F_1-F_4)	Groundwater

Contaminants of Potential Concern

As per the APECs identified in Section 7.2 of the Phase I ESA Report, the contaminants of potential concern (CPCs) in soil and/or groundwater include:

- ❒ Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).
- ❒ Petroleum Hydrocarbons (PHCs, F_1-F_4).
- ❒ Metals.

The CPCs are expected to be present in the soil and/or groundwater of the Phase I Property.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I-ESA is considered to be sufficient to conclude that there are on-site PCAs that have resulted in APECs on the Phase I 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.

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 during the interim of September 1 to September 3, 2020, in which nine (9) boreholes (BH1 through BH9) were placed across the site to address the potential environmental concerns as well as to gain coverage for geotechnical purposes. The boreholes were drilled to a maximum depth of 5.18 mbgs. Four (4) of the nine (9) borehole, were completed as a monitoring wells to access the groundwater table. All boreholes were completed using a track mounted drill rig provided by Downing Drilling Ltd. of Hawksbury, Ontario, under the full-time supervision of Paterson personnel. The borehole locations are indicated on the attached Drawing PE4169-5 – Test Hole Location Plan, appended to this report.

4.2 Soil Sampling

A total of 57 soil samples were obtained from the recent boreholes by means of grab sampling from auger flights and split spoon sampling. Split spoon samples were taken at approximate 0.76 m intervals. The depths at which auger samples and split spoon samples were obtained from the boreholes are shown as “AU” and “**SS**” on the Soil Profile and Test Data Sheets appended to this report.

The soil profile generally consisted of fill material (silty sand and with silty clay with crushed stone, cobbles and some organics), underlain by alternating layers of silty sand and sandy silt, followed by a deposit of silty clay. Bedrock was not encountered.

4.3 Field Screening Measurements

All soil samples collected were subjected to a preliminary screening procedure, which included visual screening for colour and evidence of metals, as well as soil vapour screening with a MiniRAE 2000 Portable VOC Monitor.

The technical protocol was obtained from Appendix C of the MECP document entitled “Interim Guidelines for the Remediation of Petroleum Contamination at Operating Retail and Private Fuel Outlets in Ontario”, dated March 1992.

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 ambient temperature

prior to conducting the vapour survey. Allowing the samples to stabilize to ambient temperature ensures consistency of readings between samples.

The soil vapours were measured by inserting the analyzer probe into the nominal headspace above the soil sample. Samples were then agitated/manipulated gently as the measurements were taken. The peak reading registered within the first 15 seconds was recorded as the vapour measurement. The vapour readings were found to range from 0 ppm to 288.4 ppm. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

No staining was noted during the field program. A hydrocarbon odour was noted in soil samples BH1-SS3 and BH2-SS3 during the field program. Soil samples were selected based on a combination of the results of the vapour screening, visual and olfactory screening, sample depth and/or sample location.

4.4 Groundwater Monitoring Well Installation

Four (4) groundwater monitoring wells were installed on the Phase II Property as part of the current subsurface investigation. The monitoring wells consisted of 50 mm diameter, Schedule 40 threaded PVC risers and screens. Monitoring wells are presented on the Soil Profile and Test Data Sheets provided in Appendix 1. A summary of the monitoring well construction details is provided below in Table 2.

TABLE 2: Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH1	103.53	3.81	1.68-3.81	1.24-3.81	0.13-1.24	Stick-up
BH2	103.45	3.80	1.70-3.80	1.29-3.80	0.13-1.29	Stick-up
BH6	103.80	4.49	1.49-4.49	1.27-4.49	0.13-1.27	Stick-up
BH9	103.85	3.80	0.80-3.80	0.61-3.80	0.13-0.61	Stick-up

4.5 Field Measurement of Water Quality Parameters

Groundwater samples were collected on September 11, 2020. The water levels were the only parameter measured in the field during the sampling event.

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 in Appendix 1, the soil and groundwater samples submitted for analytical testing are presented in Tables 3 and 4.

TABLE 3: Soil Samples Submitted and Analyzed Parameters

Sample ID	Sample Depth (m) and Stratigraphic Unit	Parameters Analyzed			Rationale
		BTEX	Metals	PHCs (F1-F4)	
September 1, 2020					
BH1-SS2	0.76-1.50 Fill	X		X	Assess the potential impact due to the former use of the site as well as the quality of the fill material
BH2-SS3	1.52-2.13 Fill	X		X	Assess the potential impact due to the former use of the site as well as the quality of the fill material
September 3, 2020					
BH4-SS2	0.76-1.50 Fill		X		Assess the potential impact due to the former use of the site as well as the quality of the fill material
BH5-SS2	1.50-2.10 Fill		X		Assess the potential impact due to the former use of the site as well as the quality of the fill material
BH8-AU1	0.0-0.05 Fill	X	X	X	Assess the potential impact due to the former use of the site as well as the quality of the fill material
DUP (BH8-AU1)	0.0-0.05 Fill	X			Duplicate sample for QA/QC purposes.

TABLE 4: Groundwater Samples Submitted and Analyzed Parameters

Sample ID	Screened Interval (m) and Stratigraphy Unit	Parameters Analyzed			Rationale
		BTEX	PHCs (F1-F4)	VOCs	
September 11, 2020					
BH2-GW1	1.70-3.80 Fill	X	X	X	Assess the potential impact due to the former use of the site.
BH9-GW1	0.80-3.80 Native	X	X	X	Assess the potential impact due to the former use of the site.
DUP (BH9-GW1)	0.80-3.80 Native			X	Assess the potential impact due to the former use of the site.
September 21, 2020					
MW-4-GW2	1.5-3.0 Fill	X	X		Assess the potential impact due to the former use of the site.
MW-15-GW1 (Dup)[1]	1.5-3.0 Fill	X	X		Duplicate sample for QA/QC purposes.
September 29, 2020					
BH2-GW2	1.70-3.80 Native	X	X		Confirmation sample.

Note:
- 1 – analysis only includes PHC-F1

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 borehole locations were selected by Paterson for both environmental and geotechnical purposes. Boreholes were located and surveyed in the field by Paterson to geodetic elevations.

The locations and elevations of the boreholes are presented on Drawing PE4169-5 – Test Hole Location Plan, appended to this report.

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, and custody, equipment cleaning procedures, and field quality control measurements is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

Site soils generally consisted of fill material (silty sand and with occasional silty clay with crushed stone, shale on the northern portion and cobbles and some organics), underlain by alternating layers of silty sand and sandy silt, followed by a deposit of silty clay. Bedrock was not encountered during the subsurface program.

Groundwater was encountered within either the fill or native soil at depths ranging from approximately 1.01 to 1.94 mbgs. Site geology details are provided in the Soil Profile and Test Data Sheets provided in Appendix 1.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling events on September 11, 2020 using an electronic water level meter. Groundwater levels are summarized below in Table 5.

TABLE 5: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH1	103.53	--	--	--
BH2	103.45	102.28	1.17	September 11, 2020
BH6	103.80	101.86	1.94	September 11, 2020
BH9	103.85	102.33	1.52	September 11, 2020
MW-4	102.17	101.16	1.01	September 11, 2020

Based on the groundwater elevations measured during the sampling event, a groundwater contour plan was completed. The groundwater contour mapping is shown on Drawing PE4169-5 – Groundwater Contour Plan. Based on the contour mapping, the groundwater flow beneath the Phase II Property is in a westerly direction. A horizontal hydraulic gradient of approximately 0.02 m/m was calculated.

5.3 Fine-Course Soil Texture

No grain size analysis was completed for the subject site. Coarse grained standards were chosen as a conservative approach.

5.4 Soil: Field Screening

Field screening of the soil samples collected resulted in vapour readings ranging from 0 ppm to 288.4 ppm.

No staining was noted during the field program. A hydrocarbon odour was noted in soil samples BH1-SS3 and BH2-SS3 during the field program. Soil samples were selected based on a combination of the results of the vapour screening, visual and olfactory screening, sample depth and/or sample location. The field screening results of each individual soil sample are provided on the Soil Profile and Test Data Sheets, appended to this report.

5.5 Soil Quality

Six (6) soil samples were submitted for BTEX, PHC (F_1-F_4) and/or metals analyses. The results of the analytical testing are presented in Tables 6 through 8. The laboratory certificates of analysis are provided in Appendix 1.

TABLE 6: Analytical Test Results – Soil – BTEX and PHC (F1 to F4)

Parameter	MDL (µg/g)	Soil Samples (ug/g)				MECP Table 2 Industrial Standards (µg/g)
		September 1, 2020		September 3, 2020		
		BH1-SS2	BH2-SS3	BH8-AU1	DUP	
Benzene	0.03	nd	nd	nd	nd	0.32
Ethylbenzene	0.05	nd	nd	nd	nd	1.1
Toluene	0.05	nd	nd	nd	nd	6.4
Xylenes	0.10	nd	0.09	nd	nd	26
PHC F_1	7	nd	14	nd	NA	55
PHC F_2	4	nd	11	154	NA	230
PHC F_3	8	nd	49	596	NA	1700
PHC F_4	6	nd	64	2760	NA	3300
PHC $F_{4\ gravimetric}$	50	NA	NA	2130	NA	3300

Notes:
- MDL - Method Detection Limit
- NA – Not analyzed
- nd - Not Detected (i.e <MDL)

All test results comply with the selected MECP Table 2 Industrial Standards.

TABLE 7: Analytical Test Results – Soils – Metals					
Parameter	MDL (µg/g)	Soil Samples (µg/g) September 3, 2020			MECP Table 2 Standards (µg/g)
		BH4-SS2	BH5-SS2	BH8-AU1	
Antimony	1.0	nd	nd	nd	40
Arsenic	1.0	2.4	2.3	4.0	18
Barium	1.0	38.2	50.1	21.9	670
Beryllium	0.5	nd	nd	nd	8
Boron	5.0	nd	nd	nd	120
Cadmium	0.5	nd	nd	nd	1.9
Chromium	5.0	10.3	13.0	7.2	160
Cobalt	1.0	3.9	4.1	4.1	80
Copper	5.0	7.5	5.4	7.9	230
Lead	1.0	7.9	3.2	12.4	120
Mercury	0.1	nd	nd	2.6	3.9
Nickel	5.0	8.0	7.8	8.7	270
Selenium	1.0	nd	nd	nd	5.5
Silver	0.3	nd	nd	nd	40
Thallium	1.0	nd	nd	nd	3.3
Uranium	1.0	nd	nd	nd	33
Vanadium	10.0	16.1	22.0	24.4	86
Zinc	20.0	20.3	nd	31.1	340

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

The metal results comply with MECP Table 7 Industrial Standards.

The analytical results in the soil samples analyzed with respect to borehole locations are shown on Drawing PE4169-6- Analytical Testing Plan (Soil).

The maximum concentrations of analyzed parameters in the soil at the site are summarized in Table 8.

TABLE 8: Maximum Concentrations – Soil			
Parameter	Maximum Concentration (µg/g)	Soil Sample	Depth Interval (m BGS)
Xylenes	0.09	BH2-SS3	1.52-2.13, fill
PHC F_1	154	BH8-AU1	0.0-0.05, fill
PHC F_2	596		
PHC F_3	2760		
PHC F_4	2130		
Arsenic	4.0		
Barium	50.1	BH5-SS2	1.50-2.10, fill
Chromium	13.0		
Cobalt	4.1		
Copper	7.9	BH8-AU1	0.0-0.05, fill

TABLE 8: Maximum Concentrations – Soil			
Parameter	**Maximum Concentration (µg/g)**	**Soil Sample**	**Depth Interval (m BGS)**
Xylenes	0.09	BH2-SS3	1.52-2.13, fill
Lead	12.4		
Nickel	8.7		
Vanadium	24.4		
Zinc	31.1		

The remaining parameters were not detected above the laboratory method detection limits.

5.6 Groundwater Quality

Groundwater samples were submitted for laboratory analysis of BTEX, PHC (F_1-F_4) and/or VOC analyses. The groundwater samples were obtained from the screened intervals noted in Table 2. The results of the analytical testing are presented in Tables 9 and 10. The laboratory certificates of analysis are provided in Appendix 1.

TABLE 9: Analytical Test Results – Groundwater – BTEX and PHC (F1 – F4)						
Parameter	**MDL (µg/L)**	**Groundwater Samples (µg/L)**				**MECP Table 2 Standards (µg/L)**
		September 11, 2020		**September 21, 2020**		
		BH2-GW1	**BH9-GW1**	**MW-4-GW2**	**DUP (MW-15)**	
Benzene	5	nd	nd	nd	nd	5
Ethylbenzene	0.5	**17.8**	nd	nd	nd	2.4
Toluene	0.5	nd	nd	nd	nd	24
Xylenes	0.5	41.9	nd	nd	nd	300
PHC F1	25	371	nd	nd	nd	750
PHC F2	100	nd	nd	nd	NA	150
PHC F3	100	nd	nd	nd	NA	500
PHC F4	100	nd	nd	nd	NA	500

Notes:
- MDL - Method Detection Limit
- nd - Not Detected (i.e <MDL)
- **Bold and Underlined** – Parameter exceeds the selected MECP standards.

With the exception of the ethylbenzene concentration in BH2-GW1, all BTEX and PHC concentrations comply with the selected MECP Table 2 Standards.

TABLE 10: Analytical Test Results – Groundwater – VOC

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MECP Table 2 Standards (µg/L)
		September 11, 2020			
		BH2-GW1	BH9-GW1	DUP (BH9)	
Acetone	5	nd	nd	nd	2700
Benzene	0.5	nd	nd	nd	5
Bromodichloromethane	0.5	nd	nd	nd	16
Bromoform	0.5	nd	nd	nd	25
Bromomethane	0.5	nd	nd	nd	0.89
Carbon Tetrachloride	0.2	nd	nd	nd	5
Chlorobenzene	0.5	nd	nd	nd	30
Chloroform	0.5	nd	nd	nd	22
Dibromochloromethane	0.5	nd	nd	nd	25
Dichlorodifluoromethane	1	nd	nd	nd	590
1,2-Dichlorobenzene	0.5	nd	nd	nd	3
1,3-Dichlorobenzene	0.5	nd	nd	nd	59
1,4-Dichlorobenzene	0.5	nd	nd	nd	1
1,1-Dichloroethane	0.5	nd	nd	nd	5
1,2-Dichloroethane	0.5	nd	nd	nd	5
1,1-Dichloroethylene	0.5	nd	nd	nd	14
cis-1,2-Dichloroethylene	0.5	nd	nd	nd	17
trans-1,2-Dichloroethylene	0.5	nd	nd	nd	17
1,2-Dichloropropane	0.5	nd	nd	nd	5
1,3-Dichloropropene, total	0.5	nd	nd	nd	0.5
Ethylbenzene	0.5	**17.8**	nd	nd	2.4
Ethylene dibromide	0.2	nd	nd	nd	0.2
Hexane	1	nd	nd	nd	520
Methyl Ethyl Ketone	5	nd	nd	nd	1800
Methyl Isobutyl Ketone	5	nd	nd	nd	640
Methyl tert-butyl ether	2	nd	nd	nd	15
Methylene Chloride	5	nd	nd	nd	50
Styrene	0.5	nd	nd	nd	5.4
1,1,1,2-Tetrachloroethane	0.5	nd	nd	nd	1.1
1,1,2,2-Tetrachloroethane	0.5	nd	nd	nd	1
Tetrachloroethylene	0.5	nd	nd	nd	17
Toluene	0.5	nd	nd	nd	24
1,1,1-Trichloroethane	0.5	nd	nd	nd	200
1,1,2-Trichloroethane	0.5	nd	nd	nd	5
Trichloroethylene	0.5	nd	nd	nd	5
Trichlorofluoromethane	1	nd	nd	nd	150
Vinyl Chloride	0.5	nd	nd	nd	1.7
Xylenes, total	0.5	41.9	nd	nd	300

Notes:
- MDL - Method Detection Limit
- nd - Not Detected (i.e <MDL)
- NA – parameter not analyzed
- **Bold and Underlined** – Parameter exceed the selected MECP standards.

No detectable VOC concentrations were identified in the groundwater samples analyzed, except ethylbenzene and xylenes. As previously noted, the ethylbenzene concentration in sample BH2-GW1 is in excess of the selected MECP Table 2 Standards.

An additional groundwater sample was retrieved from BH2-20 to verify the ethylbenzene exceedance.

TABLE 11: Analytical Test Results – Groundwater – BTEX and PHC (F1 – F4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)	MECP Table 2 Standards (µg/L)
		September 29, 2020	
		BH2-GW2	
Benzene	5	nd	5
Ethylbenzene	0.5	**16.1**	2.4
Toluene	0.5	0.5	24
Xylenes	0.5	25.5	300
PHC F1	25	229	750
PHC F2	100	nd	150
PHC F3	100	nd	500
PHC F4	100	nd	500

Notes:
- MDL - Method Detection Limit
- nd - Not Detected (i.e <MDL)
- **Bold and Underlined** – Parameter exceed the selected MECP standards.

The ethylbenzene concentration at BH2 is in excess of the selected MECP Table 2 Standards.

The analytical results in the groundwater with respect to borehole locations are shown on Drawing PE4169-7- Analytical Testing Plan (Groundwater).

The maximum concentrations of analyzed parameters in the groundwater beneath the site are summarized in Table 12.

TABLE 12: Maximum Concentrations – Groundwater

Parameter	Maximum Concentration (µg/L)	Groundwater Sample	Screened Interval (m BGS)
PHC F1	371	BH2-GW1	1.7-3.8
Ethylbenzene	**17.8**		
Xylenes	41.9		

The remaining parameters were not detected above the laboratory method detection limits.

5.7 Quality Assurance and Quality Control Results

All samples submitted as part of the September 2020 sampling events were handled in accordance with the Analytical Protocol with respect to preservation method, storage requirement, and container type.

As per the sampling and analysis plan, duplicate samples for soil (DUP) and groundwater (DUP and MW-15-GW) from BH8-AU1, BH9-GW1 and BH-4-GW1, respectively, were obtained and analyzed for BTEX, PHC and/or VOC parameter concentrations. All parameter concentrations were non-detected in the soil and groundwater samples. Overall, 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 general accordance with the requirements of O.Reg. 153/04, as amended by the Environmental Protection Act. Conclusions and recommendations are discussed in a subsequent section.

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

As indicated in Section 2.2 of this report, two (2) PCAs were considered to result in APECs on the Phase I Property. These APECs have been summarized in Table 13, along with their respective location and contaminants of potential concern (CPCs) on the Phase II Property.

TABLE 13: Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	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: Resulting from the importation of fill material of unknown quality	Entire Phase I Property	PCA 30 – "*Importation of Fill Material of Unknown Quality,*"	On-site	BTEXs PHCs Metals	Soil and/or groundwater
APEC 2: Resulting from the presence of a retail fuel outlet.	Southwest side of the Phase I Property	PCA 28 – "*Gasoline and Associated Products Storage in Fixed Tanks,*"	Off-site	BTEX PHCs (F_1-F_4)	Groundwater

Contaminants of Potential Concern

Based on the APECs identified on the Phase II Property, the contaminants of potential concern (CPCs) are:

- Benzene, ethylbenzene, toluene and xylenes (BTEX).
- Petroleum hydrocarbons (PHCs, Fractions F_1-F_4).
- Metals.

Subsurface Structures and Utilities

The Phase II Property is situated in a rural area where private services are relied upon (septic systems and potable water wells). The private well was noted on the southeastern side of the property. An underground electrical line was noted on the southern portion of the Phase II Property located next to the former truck repair garage/shop. All underground structures associated with the former private fuel outlet (USTs and ancillary equipment) were excavated and removed in 2017. These former underground structures are no longer considered a source of potential contamination.

Physical Setting

Site Stratigraphy

The site stratigraphy consists of:

- An asphaltic concrete structure overlying a fill layer was encountered in BH3. The fill material consisted of a silty sand and silty clay with some crushed stone/gravel, cobbles and some organics, extending to depths ranging from 0.38 to 2.30mbgs. Groundwater was encountered in this layer in BH2.
- Silty sand with some sandy silt was encountered in BH1, BH2, BH3, BH4, BH5, BH6, BH7, BH8 and BH10, and extended to depths ranging from 1.37 to 4.57 mbgs. Groundwater was encountered in this layer in BH6 and BH9.
- Silty Clay was encountered in BH1, BH2, BH3, BH4, BH5, BH6, BH7 and BH9, extending to depths ranging from 3.81 to 5.18 mbgs.
- Sand was encountered in BH8 and terminated at 5.18 mbgs.

- Silty sand or sandy silt was encountered beneath the silty clay layer in BH2, BH3, BH4, BH5 and BH7. These boreholes were terminated in this layer at depths ranging from 4.42 to 5.18 mbgs.

Hydrogeological Characteristics

Groundwater at the Phase II Property was encountered at depths of approximately 1.01 to 1.94 mbgs. Groundwater flow was measured in a westerly direction with a hydraulic gradient of 0.02 m/m. Groundwater contours are shown on Drawing PE5033-5–Test Hole Location Plan.

Approximate Depth to Water Table

The depth to the water table at the subject site varies between approximately 1.01 to 1.94 mbgs.

Approximate Depth to Bedrock

Bedrock was not encountered beneath the Phase II Property.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation does not apply to the Phase II Property, in that the subject property is not within 30m of an environmentally sensitive area.

Section 43.1 of the Regulation does not apply to the Phase II Property as it is not a shallow soil property.

Fill Placement

Based on the findings of the subsurface investigation, a fill material consisting of silty sand and silty clay wth crushed stone and shale (northern part of the site), gravel, cobbles and some organics were encountered. The fill varied in thickness from 0.38 to 2.30m.

Existing Buildings and Structures

The southern portion of the Phase II Property is occupied by two (2) concrete slab foundations/remnants of the former on-site buildings that were originally constructed in 1972. The south-eastern side of the property is occupied by two (2) sea containers, while the remaining Phase II Property is vacant.

Proposed Buildings and Other Structures

It is our understanding that the Phase II Property will be redeveloped with a slab-on-grade building that will be used for commercial to light industrial purposes.

Drinking Water Wells

One potable water well was identified on the southeastern side of the Phase I Property.

Water Bodies and Areas of Natural Significance

No water bodies or areas of natural significance were identifed on the Phase II Property or within the 250 m search radius.

Environmental Condition

Areas Where Contaminants are Present

Based on the more recent analytical results, in combination of the Pinchin's Phase II ESA, followed by the subsequent remediation program, all of the analytical results for soil and groundwater comply with the selected MECP Table 2 Standards, with the exception of the groundwater at BH2 (immediate area of the former pump island).

Types of Contaminants

No contaminants are present in the soil. The ethylbenzene concentration in the groundwater is in excess of the selected MECP Table 2 Standards in the immediate location of the former pump island.

Contaminated Media

The groundwater at BH2 is marginally impacted with ethylbenzene.

What Is Known About Areas Where Contaminants Are Present

The ethylbenzene concentration in the groundwater is present in a pocket in the immediate area of the former pump island. The impact is in the shallow groundwater.

Distribution and Migration of Contaminants

Based on the findings of the Phase II ESA, the groundwater impact at BH2 is localized in the area of the former pump island in shallow groundwater and is not expected to have migrated elsewhere on-site, based on the analytical results.

Discharge of Contaminants

The marginal ethylbenzene impact appears to be residual impact localized to the immediate area of former pump island.

Climatic and Meteorological Conditions

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two (2) ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally. Based on the soil results at BH2, climatic and meteorological conditions do not appear to apply to the Phase II Property.

Potential for Vapour Intrusion

There is no potential for vapour intrusion on the Phase II Property.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the properties addressed 5505 and 5545 Albion Road, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address the areas of potential environmental concern (APECs) that were identified on the Phase II Property during the Phase I ESA.

An initial subsurface investigation (Phase II ESA) was completed by Pinchin in 2017. Their results identified PHC and BTEX impacted soil and groundwater in the immediate vicinity of the UST nest and former pump island. Subsequently, a site remediation and UST decommissioning program was undertaken in 2017 by Paterson. Confirmatory soil and groundwater samples indicated that the site conditions in the immediate area of the excavation were in compliance with the selected MECP Table 2 Industrial Standards.

The more recent subsurface program consisted of drilling ten (10) boreholes on the Phase II Property, four (4) of which were constructed with groundwater monitoring well installations.

Soil samples were obtained from the boreholes and screened using vapour measurements along with visual and olfactory observations. Based on the screening results in combination with sample depth and location, a total of six (6) soil samples were submitted for BTEX, PHC (fractions 1 to 4), PHCs and/or metal analyses. All soil results are in compliance of the selected MECP Table 2 Industrial Standards.

Groundwater samples were recovered from four (4) of the monitoring wells. No free-phase product was observed during the groundwater sampling event. The groundwater samples were submitted for PHC (F1-F4), BTEX and/or VOC analyses. All groundwater results, with the exception of ethylbenzene from BH2, are in compliance with the selected MECP Table 2 Standards.

The ethylbenzene impact is considered to be isolated in the immediate area of the former pump island in shallow groundwater and not expected to have migrated into the deep aquifer. It is our opinion that this impacted groundwater at BH2 is not considered to pose a risk to the current and/or future use of the Phase II Property or the neighbouring lands as the ethylbenzene concentration (marginally in excess of Table 2) will naturally attenuate over time.

Recommendations

It is recommended that the monitoring wells on-site be properly abandoned if they are not going to be used in the future. They should be abandoned according to Ontario Regulation 903. The wells will be registered with the MECP under this regulation.

7.0 STATEMENT OF LIMITATIONS

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

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

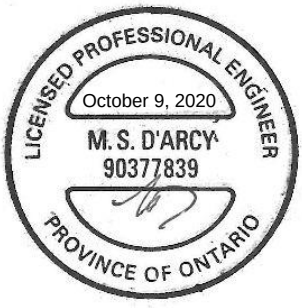
Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of W.O. Stinson & Son Ltd. Notification from W.O. Stinson & Son Ltd. and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Mandy Witteman, B.Eng., M.A.Sc.

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



Report Distribution:

- W.O. Stinson & Son Ltd.
- Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

Drawing PE4169-5 –Test Hole Location Plan

Drawing PE4169-6– Analytical Testing Plan – Soil

Drawing PE4169-6A –Cross-section A-A'– Soil

Drawing PE4169-6B –Cross-section B-B'– Soil

Drawing PE4169-7– Analytical Testing Plan – Groundwater

Drawing PE4169-7A –Cross-section A-A'– Groundwater

Drawing PE4169-7B –Cross-section B-B'–Groundwater

#5480 BANK STREET
VACANT LAND

MITCH OWENS ROAD

#6690 MITCH OWENS ROAD
COMMERCIAL LAND

#5505 ALBION ROAD
BUS STORAGE YARD

#5545 ALBION ROAD

#5457 ALBION ROAD
COMMERCIAL

BH 7
103.62

BH 5
103.34

BH 8
103.74

BH 9
103.85
(102.33)

BH 10
103.89

BH 6
103.80
(101.86)

BH 1
103.53

BH 3
103.46

BH 2
103.45
(102.28)

BH 4
103.68

MW-1
MW-2
MW-3
MW-4
102.35
(101.34)
MW-5
MW-6
MW-7
MW-8

BUILDING FOUNDATION
(FORMER GARAGE BUILDING)

FORMER
BUILDING
FOUNDATION

GRASSED

ASPHALTIC
CONCRETE

FORMER PUMP
ISLAND LOCATION

FORMER UNDERGROUND
TANK NEST LOCATION

GRASSED

102.3
102.2
102.1
102
101.9
101.8
101.7
101.6
101.5
(0.02m/m)

A
A'
B
B'

DISCHARGE OF FLOOR DRAIN
CONTENTS

APPROXIMATE AREA OF
REMEDIATION EXCAVATION,
PATERSON GROUP, 2017

ALBION ROAD

#627 BALLYCASTLE CRES.
RESIDENTIAL

KILLYMOON WAY

#635 BALLYCASTLE CRES.
RESIDENTIAL

#639 BALLYCASTLE CRESCENT
RESIDENTIAL

#643 BALLYCASTLE CRESCENT
RESIDENTIAL

RESIDENTIAL

#5546 ALBION ROAD
McEWEN GAS STATION

LEGEND:

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- MONITORING WELL LOCATION BY OTHERS
- DESTROYED MONITORING WELL LOCATION BY OTHERS
- 103.45 GROUND SURFACE ELEVATION (m)
- (102.28) GROUNDWATER SURFACE ELEVATION (m)
- 101.5 GROUNDWATER CONTOUR(m)
- (0.02m/m) APPROXIMATE GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

GROUND SURFACE ELEVATIONS REFERENCED TO A GEODETIC DATUM.

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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W.O. STINSON & SON LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1000	Date: 09/2020
Drawn by: MPG	Report No.: PE4169-2
Checked by: MW	Dwg. No.: PE4169-5
Approved by: MSD	Revision No.:

11x17

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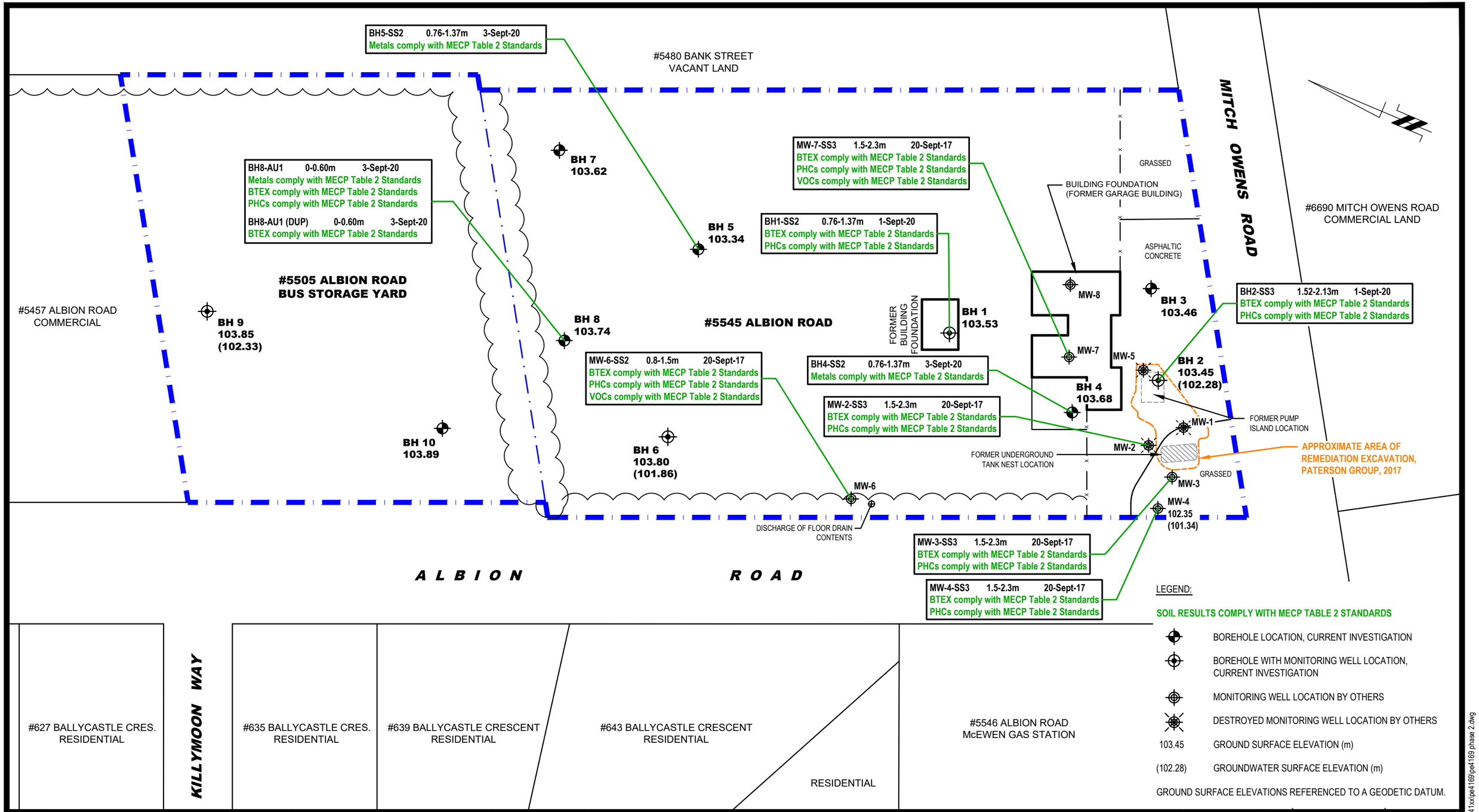

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL

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Drawn by: MPG	Report No.: PE4169-2
Checked by: MW	Dwg. No.: PE4169-6
Approved by: MSD	Revision No.:

11x17

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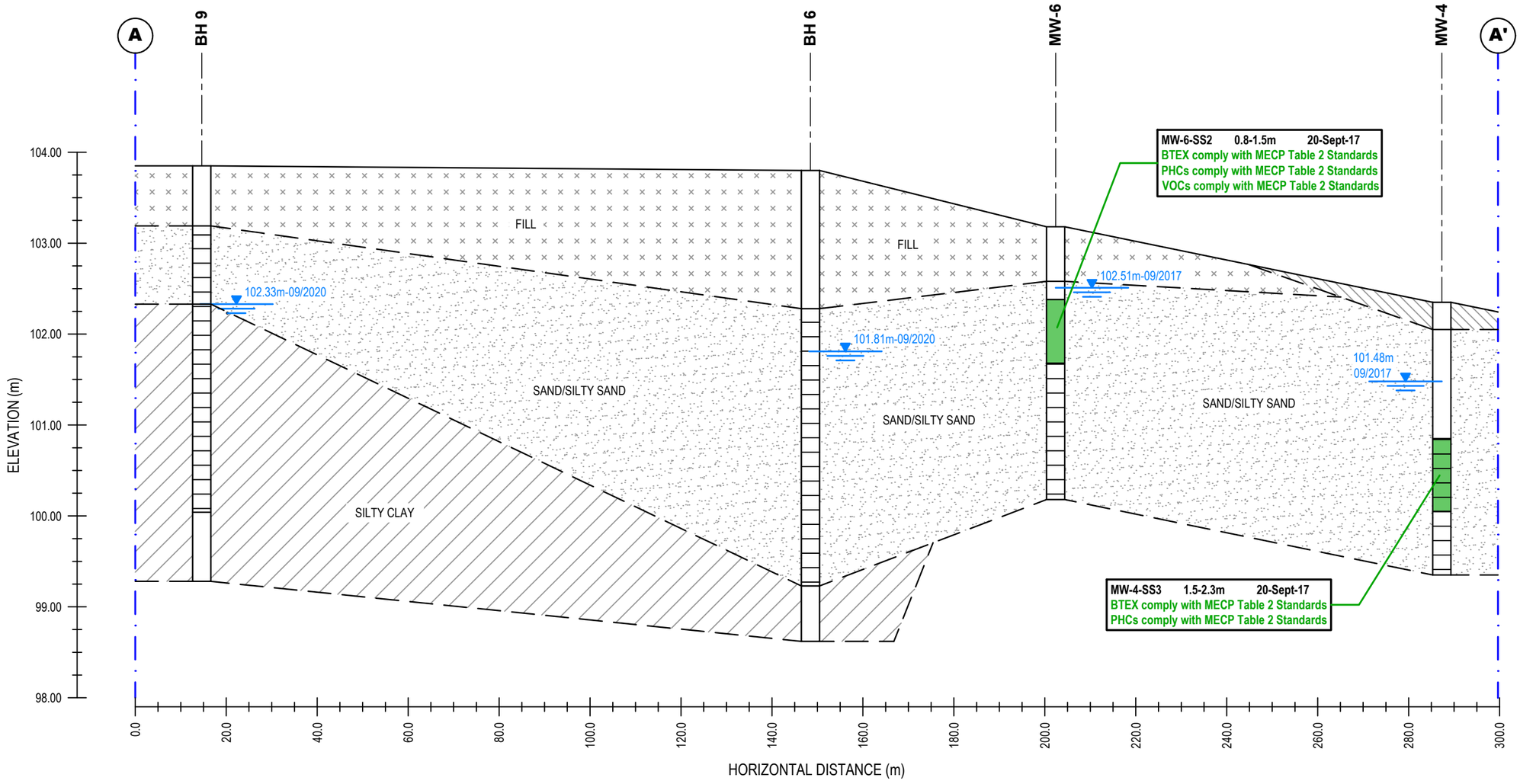

SOIL RESULTS COMPLY WITH MECP TABLE 2 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:

CROSS-SECTION A-A' - SOIL

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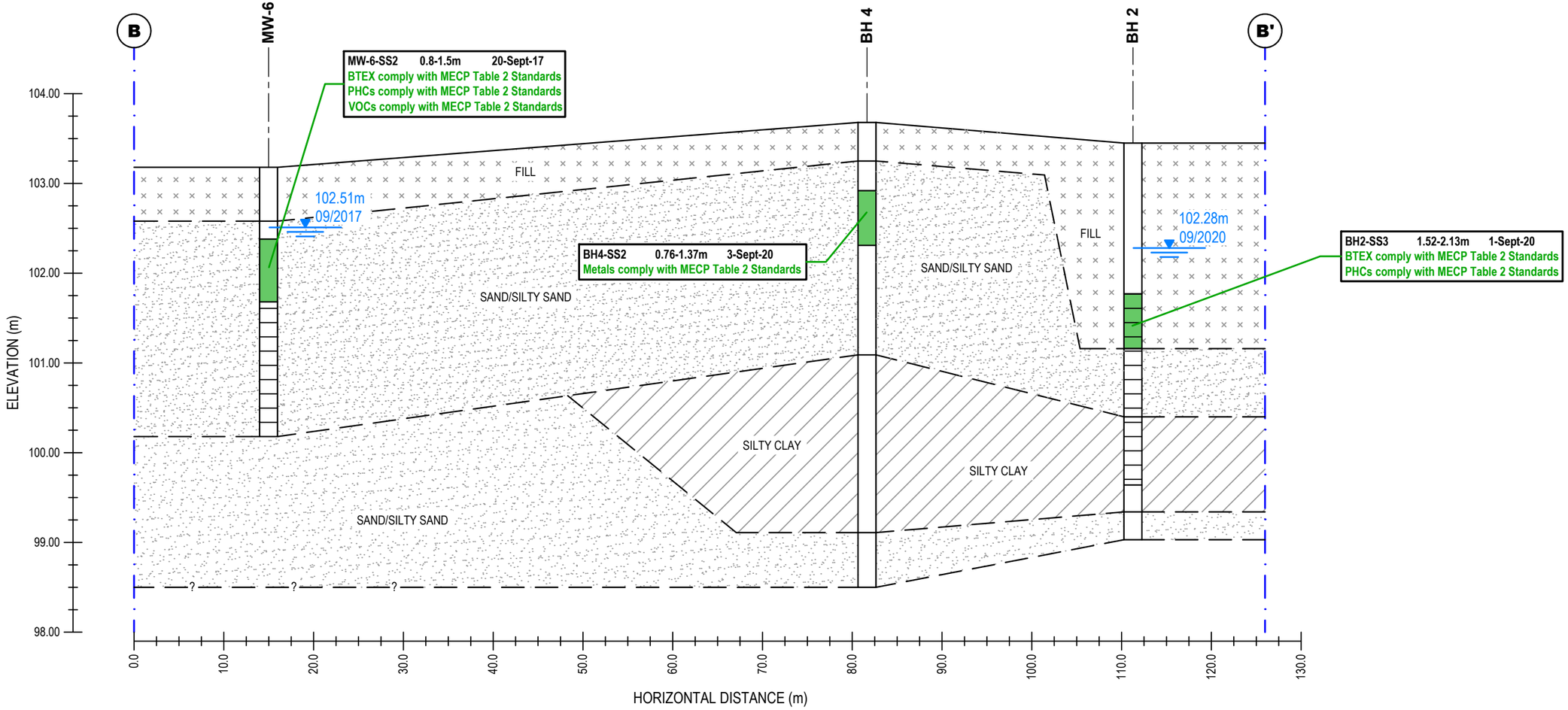

SOIL RESULTS COMPLY WITH MECP TABLE 2 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:

CROSS-SECTION B-B' - SOIL

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Approved by: MSD	Revision No.:

11x17

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#5480 BANK STREET
VACANT LAND

BH9-GW1 0.76-3.81m 11-Sept-20
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards
VOCs comply with MECP Table 2 Standards

BH9-GW1 (DUP) 0.76-3.81m 11-Sept-20
VOCs comply with MECP Table 2 Standards

BH 7
103.62

MW-8 1.5-3.0m 27-Sept-17
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards
VOCs comply with MECP Table 2 Standards

BH 5
103.34

MW-7 1.5-3.0m 27-Sept-17
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards
VOCs comply with MECP Table 2 Standards

BH2-GW1 1.70-3.80m 11-Sept-20

Parameter	Results (ug/L)	Parameter (ug/L)
Ethylbenzene	17.8	2.4

PHCs comply with MECP Table 2 Standards
All other VOCs comply with MECP Table 2 Standards

BH2-GW2 1.70-3.80m 29-Sept-20

Parameter	Results (ug/L)	Parameter (ug/L)
Ethylbenzene	16.1	2.4

PHCs comply with MECP Table 2 Standards
All other VOCs comply with MECP Table 2 Standards

#6690 MITCH OWENS ROAD
COMMERCIAL LAND

#5457 ALBION ROAD
COMMERCIAL

#5505 ALBION ROAD
BUS STORAGE YARD

BH 9
103.85
(102.33)

BH 8
103.74

#5545 ALBION ROAD

GRASSED

BUILDING FOUNDATION
(FORMER GARAGE BUILDING)

ASPHALTIC
CONCRETE

FORMER
BUILDING
FOUNDATION

BH 1
103.53

MW-8

BH 3
103.46

MW-7

MW-5

BH 2
103.45
(102.28)

BH 4
103.68

MITCH OWENS ROAD

FORMER PUMP ISLAND LOCATION

MW-1

MW-2

FORMER UNDERGROUND
TANK NEST LOCATION

APPROXIMATE AREA OF
REMEDIATION EXCAVATION,
PATERSON GROUP, 2017

GRASSED

MW-3

MW-4
102.35
(101.34)

MW-6 1.5-3.0m 27-Sept-17
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards
VOCs comply with MECP Table 2 Standards

BH 10
103.89

BH 6
103.80
(101.86)

MW-6

DISCHARGE OF FLOOR DRAIN
CONTENTS

MW-3 1.5-3.0m 27-Sept-17
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards

ALBION ROAD

#627 BALLYCASTLE CRES.
RESIDENTIAL

KILLYMOON WAY

#635 BALLYCASTLE CRES.
RESIDENTIAL

#639 BALLYCASTLE CRESCENT
RESIDENTIAL

#643 BALLYCASTLE CRESCENT
RESIDENTIAL

RESIDENTIAL

MW-4 1.5-3.0m 27-Sept-17
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards

MW-4 1.5-3.0m 21-Sept-20
BTEX comply with MECP Table 2 Standards
PHCs comply with MECP Table 2 Standards

MW-4-GW (DUP) 1.5-3.0m 21-Sept-20
BTEX comply with MECP Table 2 Standards
PHC-F1 comply with MECP Table 2 Standards

LEGEND:

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 2 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 2 STANDARDS

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- MONITORING WELL LOCATION BY OTHERS
- DESTROYED MONITORING WELL LOCATION BY OTHERS
- 103.45 GROUND SURFACE ELEVATION (m)
- (102.28) GROUNDWATER SURFACE ELEVATION (m)

GROUND SURFACE ELEVATIONS REFERENCED TO A GEODETIC DATUM.

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN - GROUNDWATER

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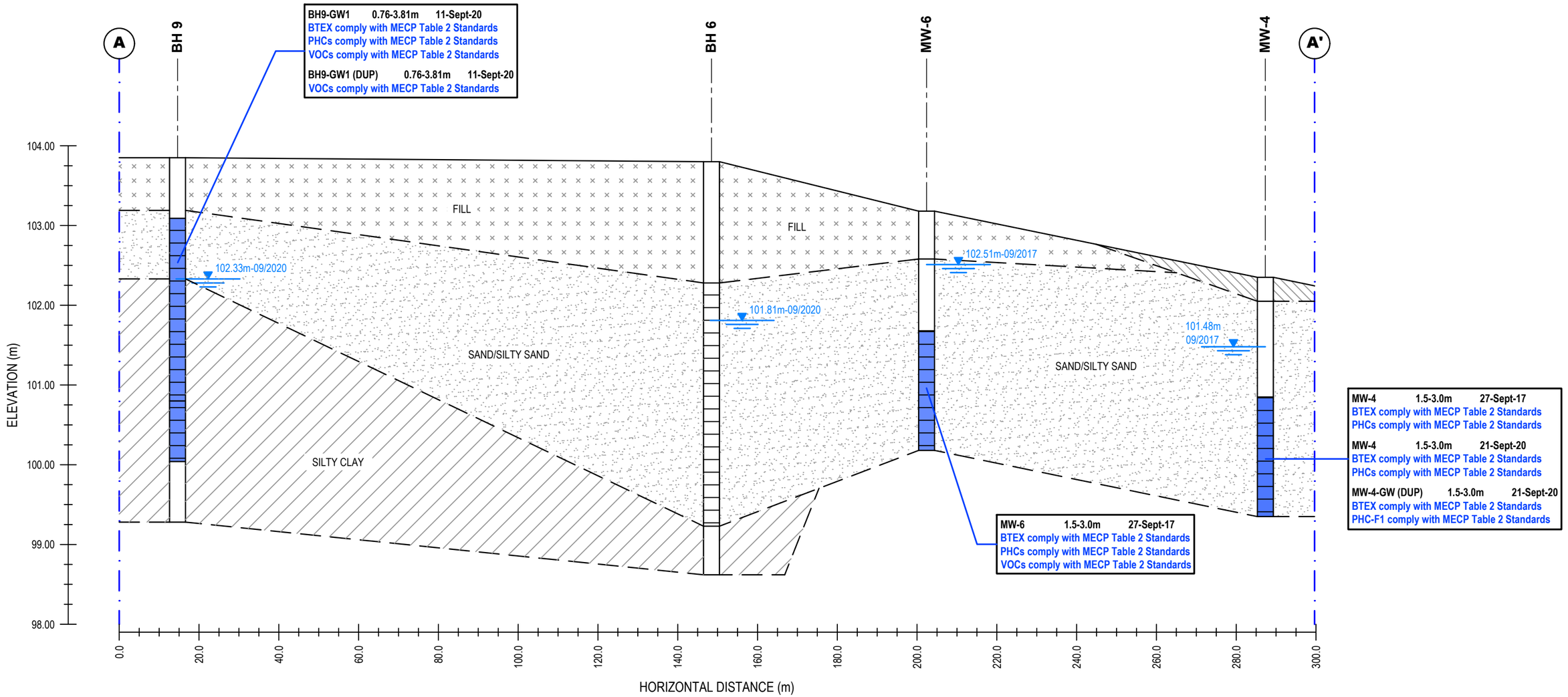

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 2 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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W.O. STINSON & SON LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:

CROSS-SECTION A-A' - GROUNDWATER

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Drawn by: MPG	Report No.: PE4169-2
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Approved by: MSD	Revision No.:

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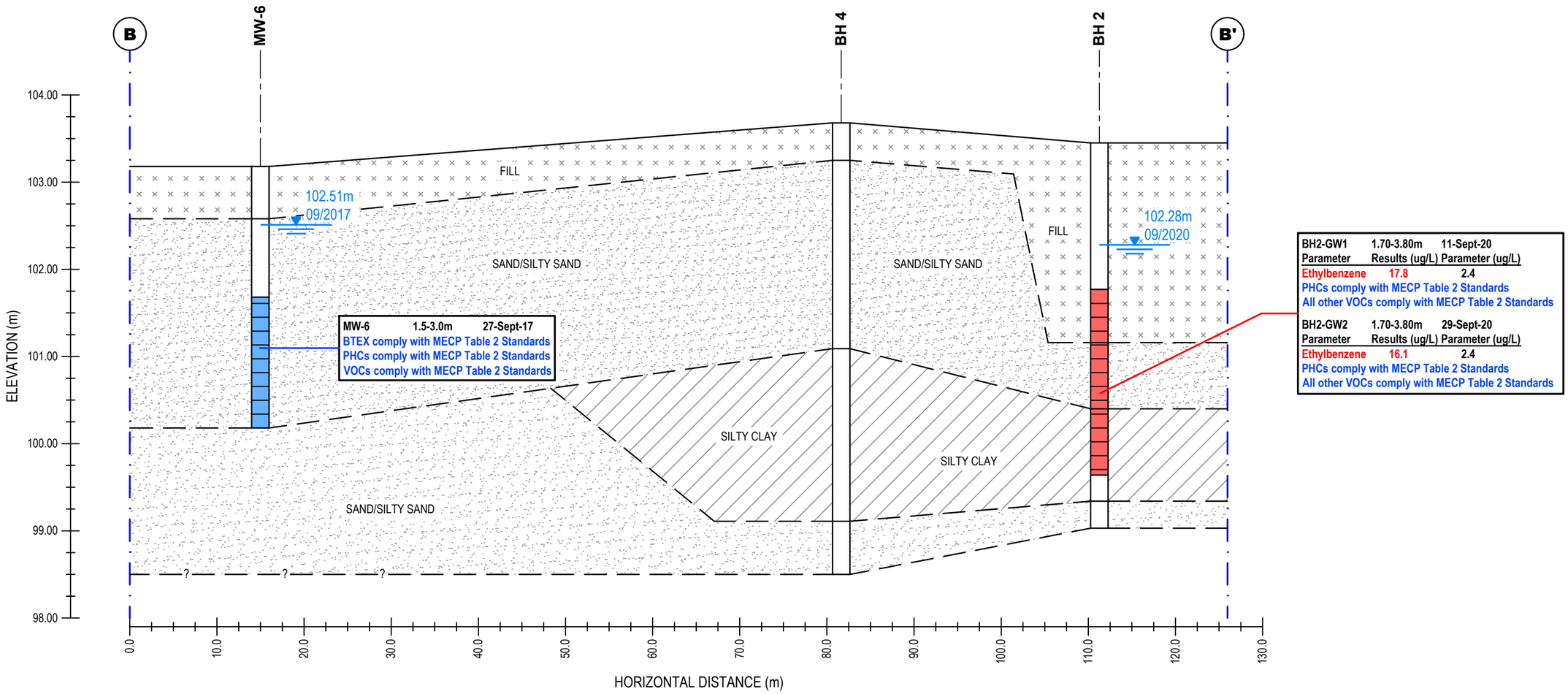

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 2 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 2 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

W.O. STINSON & SON LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
5505 AND 5545 ALBION ROAD

OTTAWA, ONTARIO

Title:

CROSS-SECTION B-B' - GROUNDWATER

Scale: AS SHOWN	Date: 09/2020
Drawn by: MPG	Report No.: PE4169-2
Checked by: MW	Dwg. No.: PE4169-7B
Approved by: MSD	Revision No.:

11x17

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APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

Paterson Group Inc.

Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

patersongroup

Sampling & Analysis Plan

Phase II Environmental Site Assessment
5505 and 5545 Albion Road
Ottawa, Ontario

Prepared For

W.O. Stinson & Son Ltd.

September 2020

Report: PE4169-SAP

Table of Contents

1.0 SAMPLING PROGRAM

Paterson was retained by W.O Stinson & Son Ltd. to conduct a Phase II Environmental Site Assessment (ESA) for the property addressed 5505 and 5545 Albion Road, in the City of Ottawa, Ontario.

The Phase II ESA was carried out to address the areas of potential environmental concern on the Phase II Property in conjunction with a geotechnical investigation. The following subsurface investigation program was developed.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 3 m below the existing ground surface to intercept the groundwater table and install a well.
BH2	Place on the Phase II Property to assess the potential impact in the immediate area of the former pump island.	Borehole to be advanced to approximate 3 m below the existing ground surface to intercept the groundwater table and install a well.
BH3	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface.
BH4	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface.
BH5	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface.
BH6	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface to intercept the groundwater table and install a well.
BH7	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface.
BH8	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface.
BH9	Place on the Phase II Property to gain coverage to assess the quality of the fill material and/or for geotechnical purposes	Borehole to be advanced to approximate 5 m below the existing ground surface to intercept the groundwater table and install a well.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH10	Place on the Phase II Property to gain coverage to assess the quality of the fill material as well as for geotechnical purposes	Borehole to be advanced to approximate 3 m below the existing ground surface to intercept the groundwater table and install a well.

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

2.0 ANALYTICAL TESTING PROGRAM

The analytical testing program for soil at the subject site is based on the following general considerations:

- ❒ At least one sample from each borehole should be submitted, in order to delineate the horizontal extent of contamination across the site.
- ❒ At least one sample from each stratigraphic unit should be submitted, in order to delineate the vertical extent of contamination at the site.
- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MOECC 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 groundwater 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 should be measured using a measuring tape or wheel rather than paced off. Boreholes were located and surveyed in the field by Paterson. All borehole were measured at geodetic elevations.

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 F1, 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” [1.52 m x 50 mm] threaded sections of Schedule 40 PVC slotted well screen (5’ x 1 ¼” [1.52 m x 32 mm] if installing in cored hole in bedrock)
- ❒ 5’ x 2” [1.52 m x 50 mm] threaded sections of Schedule 40 PVC riser pipe (5’ x 1 ¼” [1.52 m x 32 mm] if installing in cored hole in bedrock)
- ❒ Threaded end-cap
- ❒ Slip-cap or J-plug
- ❒ Asphalt cold patch or concrete
- ❒ Silica Sand
- ❒ Bentonite chips (Holeplug)
- ❒ Steel flushmount casing

Procedure

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

3.3 Monitoring Well Sampling Procedure

Equipment

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

Sampling Procedure

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

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

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

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

5.0 DATA QUALITY OBJECTIVES

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

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

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

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

For the purpose of calculating the RPD, it is desirable to select field duplicates from samples for which parameters are present in concentrations above laboratory detection limits, i.e. samples which are expected to be contaminated. If parameters are below laboratory detection limits for selected samples or duplicates, the RPD may be calculated using a concentration equal to one half (0.5 x) 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 MECP 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.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
5505 and 5545 Albion Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 1

BORINGS BY CME-55 Low Clearance Drill **DATE** September 1, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	103.53
FILL: Brown silty sand, some crushed stone, trace organics		AU	1				
0.56							
Compact, light brown **SILTY SAND**		SS	2	46	12	1	102.53
1.37							
Loose, grey **SANDY SILT**		SS	3	42	4	2	101.53
2.13							
Loose, grey **SILTY SAND**		SS	4	96	6		
2.74						3	100.53
Firm, grey **SILTY CLAY**		SS	5	33	2		
3.81							
End of Borehole							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
5505 and 5545 Albion Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 2

BORINGS BY CME-55 Low Clearance Drill **DATE** September 1, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	103.45
FILL: Dark brown silty sand with crushed stone		AU	1				
0.60							
FILL: Brown silty sand, trace asphalt		SS	2	33	8	1	102.45
		SS	3	29	5	2	101.45
2.29							
Very loose, grey **SILTY SAND**		SS	4	54	2	3	100.45
3.05							
Stiff, grey **SILTY CLAY**		SS	5	58	2		
4.11						4	99.45
Loose, grey **SILTY SAND**		SS	6	54	P		
4.42							
End of Borehole							
(GWL @ 1.17m - Sept. 11, 2020)							

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

20 40 60 80

288.4

100 200 300 400 500

RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

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SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
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FILE NO. PE4169

REMARKS

HOLE NO. BH 3

BORINGS BY CME-55 Low Clearance Drill **DATE** September 1, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Asphaltic concrete 0.08						0	103.46
FILL: Brown silty sand with crushed stone 0.63		AU	1				
		SS	2	58	14	1	102.46
Loose, grey **SILTY SAND**		SS	3	54	8	2	101.46
		SS	4	38	5		
3.05						3	100.46
		SS	5	79	3		
Stiff to very stiff, grey **SILTY CLAY**							
- silt content increasing with depth		SS	6	62	30	4	99.46
4.65							
Loose, grey **SANDY SILT**		SS	7	83	7	5	98.46
5.18							
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

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FILE NO. PE4169

REMARKS

HOLE NO. BH 4

BORINGS BY CME-55 Low Clearance Drill **DATE** September 1, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE						0	103.68		
FILL: Brown silty sand with crushed stone, trace organics		AU	1						
0.43									
		SS	2	38	9	1	102.68		
Loose, brown **SILTY SAND**, trace gravel and shells		SS	3	29	10	2	101.68		
2.59		SS	4	100	6				
Stiff to very stiff, grey **SILTY CLAY**		SS	5	100	P	3	100.68		
		SS	6	79	3	4	99.68		
4.57									
Dense, grey **SANDY SILT**		SS	7	33	31	5	98.68		
5.18									
End of Borehole									

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

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

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Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 5

BORINGS BY CME-55 Low Clearance Drill **DATE** September 1, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	103.34
FILL: Dark brown silty sand with gravel, some crushed stone		AU	1				
0.43							
		SS	2	54	16	1	102.34
Compact to very loose, grey **SILTY SAND,** trace shells		SS	3	21	14	2	101.34
		SS	4	100	2		
2.74						3	100.34
Stiff, grey **SILTY CLAY**							
4.11		SS	5	79	10	4	99.34
Compact, grey **SANDY SILT,** trace gravel		SS	6	38	17	5	98.34
5.18							
End of Borehole							

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

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

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

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Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 6

BORINGS BY CME-55 Low Clearance Drill **DATE** September 1, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	103.80
FILL: Brown silty sand with crushed stone		AU	1				
0.51							
FILL: Brown/black silty sand, trace crushed stone		SS	2	62	21	1	102.80
1.52							
		SS	3	71	15	2	101.80
Compact, grey **SILTY SAND,** trace shells		SS	4	33	13	3	100.80
		SS	5	100	12	4	99.80
4.57							
Soft, grey **SILTY CLAY**		SS	6	92	2	5	98.80
5.18							
End of Borehole							
(GWL @ 1.94m - Sept. 11, 2020)							

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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SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
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Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 7

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	103.62
FILL: Brown silty sand with gravel and organics		AU	1				
0.38							
Loose, brown **SILTY SAND**, with brown clay		SS	2	79	7	1	102.62
1.52							
		SS	3	29	8	2	101.62
Soft, grey **SILTY CLAY**		SS	4	96	2		
3.05						3	100.62
		SS	5	12	9		
Loose, grey **SILTY SAND** with clay		SS	6	79	W	4	99.62
		SS	7	12	9		
5.18						5	98.62
End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
5505 and 5545 Albion Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 8

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
FILL: Brown/black silty sand with crushed stone, some organics		AU	1			0	103.74		
0.36									
		SS	2	58	9	1	102.74		
Loose, red-brown **SILTY SAND**									
- brown with clay by 1.5m depth.		SS	3	54	4	2	101.74		
2.29									
		SS	4	42	7	3	100.74		
		SS	5	79	6				
Loose, grey **SAND,** trace shells		SS	6	100	7	4	99.74		
		SS	7	100	5	5	98.74		
5.18									
End of Borehole									

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

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
5505 and 5545 Albion Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH 9

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	103.85
FILL: Black silty sand with crushed stone, some shale		AU	1				
0.66							
Loose, brown/black **SILTY SAND** with grey clay, trace gravel		SS	2	46	6	1	102.85
1.52							
		SS	3	42	6	2	101.85
Grey/black **SILTY CLAY** with grey sand		SS	4	46	2		
3.05						3	100.85
		SS	5	83	2		
Stiff, grey **SILTY CLAY**		SS	6	100	P	4	99.85
4.57							
End of Borehole							
(GWL @ 1.52m - Sept. 11, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
5505 and 5545 Albion Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE4169

REMARKS

HOLE NO. BH10

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
FILL: Brown silty sand with crushed stone, gravel and cobbles, trace clay 0.10		AU	1			0	103.89
Compact, brown **SILTY SAND**		SS	2	38	25	1	102.89
1.37							
End of Borehole							

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

20 40 60 80

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

Monitoring Well Construction

SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

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

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

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

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

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

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

ROCK DESCRIPTION

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

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

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

SAMPLE TYPES

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

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

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

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

CONSOLIDATION TEST

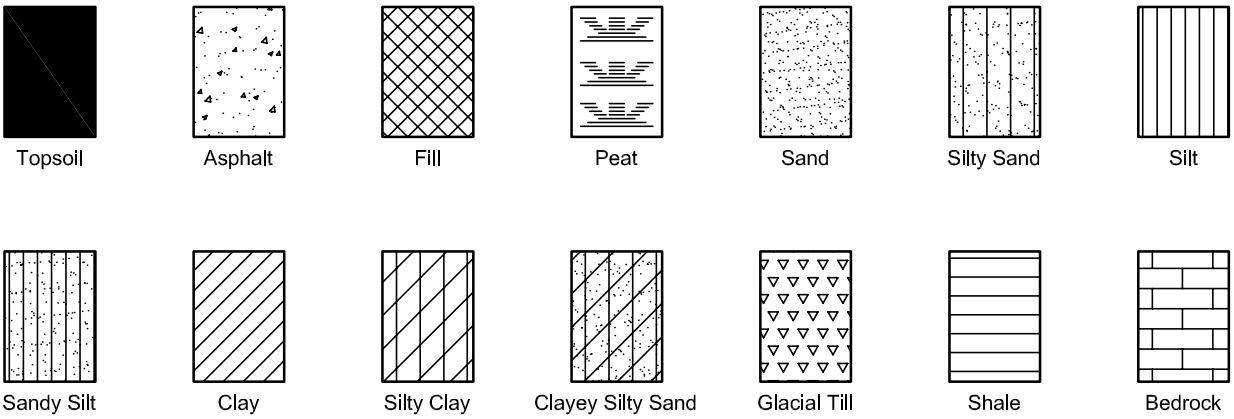
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

PERMEABILITY TEST

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

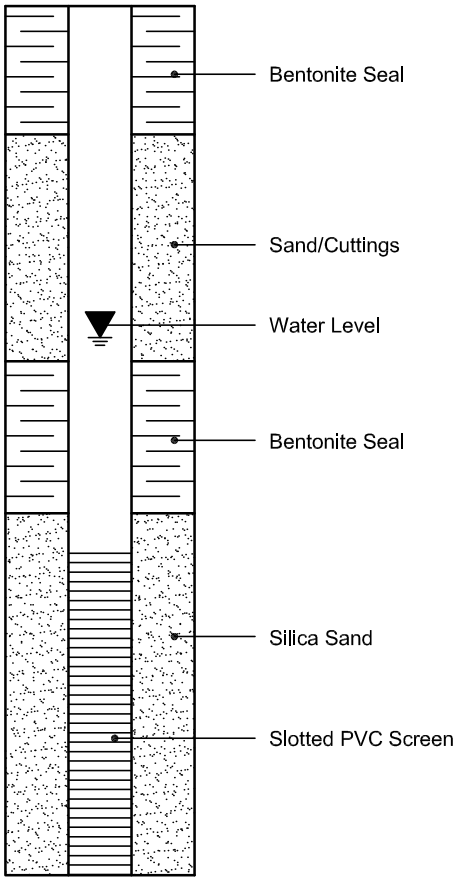
SYMBOLS AND TERMS (continued)

STRATA PLOT

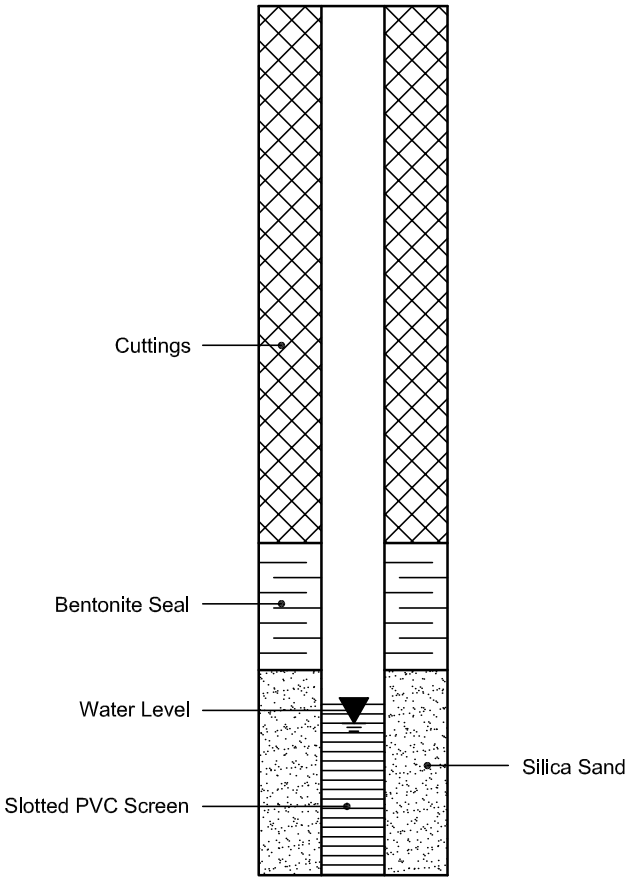


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 30724
Project: PE4169
Custody: 128136

Report Date: 9-Sep-2020
Order Date: 4-Sep-2020

Order #: 2036651

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

Paracel ID	Client ID
2036651-01	BH1-SS2
2036651-02	BH2-SS3

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 09-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 4-Sep-2020

Client PO: 30724

Project Description: PE4169

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	8-Sep-20	9-Sep-20
PHC F1	CWS Tier 1 - P&T GC-FID	8-Sep-20	9-Sep-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	8-Sep-20	9-Sep-20
Solids, %	Gravimetric, calculation	8-Sep-20	9-Sep-20

Certificate of Analysis

Report Date: 09-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 4-Sep-2020

Client PO: 30724

Project Description: PE4169

	Client ID:	BH1-SS2	BH2-SS3	-	-
	Sample Date:	01-Sep-20 09:00	01-Sep-20 09:00	-	-
	Sample ID:	2036651-01	2036651-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	86.5	86.8	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	0.09	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	0.09	-	-
Toluene-d8	Surrogate	115%	108%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	14	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	11	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	49	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	64	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*3.61*		*ug/g*		*113*	*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	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	84.1	0.1	% by Wt.	84.3			0.3	25	
Volatiles									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*4.34*		*ug/g dry*		*117*	*50-140*			

Certificate of Analysis

Report Date: 09-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 4-Sep-2020

Client PO: 30724

Project Description: PE4169

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	172	7	ug/g	ND	86.2	80-120			
F2 PHCs (C10-C16)	92	4	ug/g	ND	99.5	60-140			
F3 PHCs (C16-C34)	268	8	ug/g	ND	118	60-140			
F4 PHCs (C34-C50)	171	6	ug/g	ND	119	60-140			
Volatiles									
Benzene	3.03	0.02	ug/g	ND	75.8	60-130			
Ethylbenzene	3.54	0.05	ug/g	ND	88.5	60-130			
Toluene	3.81	0.05	ug/g	ND	95.4	60-130			
m,p-Xylenes	7.42	0.05	ug/g	ND	92.8	60-130			
o-Xylene	3.97	0.05	ug/g	ND	99.2	60-130			
Surrogate: Toluene-d8	*2.93*		*ug/g*		*91.5*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2036651

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2036651	Nº 128136

Client Name: Paterson	Project Ref: PE 4169	Page 1 of 1
Contact Name: Mark D'Arcy	Quote #:	Turnaround Time
Address: 154 Colonnade	PO #: 30724	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 613 226 7381	E-mail: mdarcy@patersongroup.ca	Date Required:

Regulation 153/04	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	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH1-SS2	S		2	SEP 1/2020		✓						
2	BH2-SS3	S		2	SEPT. 01/2020		✓						
3													
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Sumeeporn Okmol	Verified By:
Relinquished By (Print): Dominic Landry	Date/Time:	Date/Time: Sept 4, 2020 04:55	Date/Time: Sept 4, 2020 18:05
Date/Time: SEPTEMBER 04/2020	Temperature: °C	Temperature: 14.9 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 30844
Project: PE4169
Custody: 128184

Report Date: 23-Sep-2020
Order Date: 17-Sep-2020

Order #: 2038558

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

Paracel ID	Client ID
2038558-01	BH4-SS2
2038558-02	BH5-SS2
2038558-03	BH8-AU1
2038558-04	DUP

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 23-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	18-Sep-20	19-Sep-20
PHC F1	CWS Tier 1 - P&T GC-FID	18-Sep-20	19-Sep-20
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	21-Sep-20	21-Sep-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Sep-20	21-Sep-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	21-Sep-20	22-Sep-20
Solids, %	Gravimetric, calculation	18-Sep-20	21-Sep-20

Certificate of Analysis

Report Date: 23-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

	Client ID:	BH4-SS2	BH5-SS2	BH8-AU1	DUP
	Sample Date:	03-Sep-20 09:00	03-Sep-20 09:00	03-Sep-20 09:00	03-Sep-20 09:00
	Sample ID:	2038558-01	2038558-02	2038558-03	2038558-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.3	84.5	95.5	96.1
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	2.4	2.3	4.0	-
Barium	1.0 ug/g dry	38.2	50.1	21.9	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	<5.0	<5.0	<5.0	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	10.3	13.0	7.2	-
Cobalt	1.0 ug/g dry	3.9	4.1	4.1	-
Copper	5.0 ug/g dry	7.5	5.4	7.9	-
Lead	1.0 ug/g dry	7.9	3.2	12.4	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	2.6	-
Nickel	5.0 ug/g dry	8.0	7.8	8.7	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	16.1	22.0	24.4	-
Zinc	20.0 ug/g dry	20.3	<20.0	31.1	-
Volatiles					
Benzene	0.02 ug/g dry	-	-	<0.02 [1]	<0.02 [1]
Ethylbenzene	0.05 ug/g dry	-	-	<0.05 [1]	<0.05 [1]
Toluene	0.05 ug/g dry	-	-	<0.05 [1]	<0.05 [1]
m,p-Xylenes	0.05 ug/g dry	-	-	<0.05 [1]	<0.05 [1]
o-Xylene	0.05 ug/g dry	-	-	<0.05 [1]	<0.05 [1]
Xylenes, total	0.05 ug/g dry	-	-	<0.05 [1]	<0.05 [1]
Toluene-d8	Surrogate	-	-	114% [1]	115% [1]
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	-	<7 [1]	-
F2 PHCs (C10-C16)	4 ug/g dry	-	-	154 [1]	-
F3 PHCs (C16-C34)	8 ug/g dry	-	-	596 [1]	-
F4 PHCs (C34-C50)	6 ug/g dry	-	-	2760 [1] [2]	-
F4G PHCs (gravimetric)	50 ug/g dry	-	-	2130	-

Certificate of Analysis

Report Date: 23-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
F4G PHCs (gravimetric)	ND	50	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	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	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						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.21*		*ug/g*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Antimony	1.3	1.0	ug/g dry	ND			NC	30	
Arsenic	3.4	1.0	ug/g dry	3.7			8.4	30	
Barium	61.6	1.0	ug/g dry	71.5			14.8	30	
Beryllium	0.6	0.5	ug/g dry	0.6			1.9	30	
Boron	ND	5.0	ug/g dry	5.6			NC	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	17.9	5.0	ug/g dry	20.1			11.5	30	
Cobalt	6.6	1.0	ug/g dry	7.5			12.6	30	
Copper	13.5	5.0	ug/g dry	14.7			8.4	30	
Lead	10.6	1.0	ug/g dry	10.3			2.5	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	14.4	5.0	ug/g dry	15.9			9.7	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	25.5	10.0	ug/g dry	28.6			11.7	30	
Zinc	51.1	20.0	ug/g dry	54.3			6.2	30	
Physical Characteristics									
% Solids	91.5	0.1	% by Wt.	92.2			0.8	25	
Volatiles									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*10.9*		*ug/g dry*		*115*	*50-140*			

Certificate of Analysis

Report Date: 23-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	204	7	ug/g	ND	102	80-120			
F2 PHCs (C10-C16)	97	4	ug/g	ND	106	60-140			
F3 PHCs (C16-C34)	261	8	ug/g	ND	116	60-140			
F4 PHCs (C34-C50)	187	6	ug/g	ND	131	60-140			
F4G PHCs (gravimetric)	920	50	ug/g	ND	92.0	80-120			
Metals									
Antimony	43.6	1.0	ug/g	ND	87.0	70-130			
Arsenic	48.5	1.0	ug/g	2.8	91.3	70-130			
Barium	73.4	1.0	ug/g	28.6	89.6	70-130			
Beryllium	46.1	0.5	ug/g	0.5	91.2	70-130			
Boron	43.1	5.0	ug/g	ND	78.6	70-130			
Cadmium	45.9	0.5	ug/g	ND	91.6	70-130			
Chromium	56.2	5.0	ug/g	15.8	80.8	70-130			
Cobalt	50.3	1.0	ug/g	5.7	89.3	70-130			
Copper	51.6	5.0	ug/g	11.6	80.0	70-130			
Lead	49.4	1.0	ug/g	9.2	80.5	70-130			
Molybdenum	47.3	1.0	ug/g	ND	94.1	70-130			
Nickel	53.0	5.0	ug/g	12.4	81.2	70-130			
Selenium	44.8	1.0	ug/g	ND	89.0	70-130			
Silver	45.2	0.3	ug/g	ND	90.3	70-130			
Thallium	44.3	1.0	ug/g	ND	88.4	70-130			
Uranium	44.9	1.0	ug/g	ND	89.0	70-130			
Vanadium	59.5	10.0	ug/g	22.1	74.7	70-130			
Zinc	64.9	20.0	ug/g	21.7	86.2	70-130			
Volatiles									
Benzene	4.23	0.02	ug/g	ND	106	60-130			
Ethylbenzene	3.98	0.05	ug/g	ND	99.5	60-130			
Toluene	3.82	0.05	ug/g	ND	95.5	60-130			
m,p-Xylenes	8.15	0.05	ug/g	ND	102	60-130			
o-Xylene	4.02	0.05	ug/g	ND	101	60-130			
Surrogate: Toluene-d8	*7.71*		*ug/g*		*96.4*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Holding time had been exceeded upon receipt of the sample at the laboratory.

2 : GC-FID signal did not return to baseline by C50

Sample Data Revisions

None

Work Order Revisions / Comments:

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 when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2038558

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2038557 - Water 2038558 - Soil	№ 128184

Client Name: PATERSON	Project Ref: PE4169	Page __ of __
Contact Name: MARK D'ARCY	Quote #:	**Turnaround Time**
Address: 154 COLONNADE Rd. S. OTTAWA, ONT.	PO #: 30844	☐ 1 day ☐ 3 day
Telephone: (613) 226-7381	E-mail: mdarcy@PATERSONGROUP.CA	☐ 2 day ☐ Regular
		Date Required:

Regulation 153/04	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)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH2 - GW1	GW	\	3	SEPT. 11/20	\	✓	✓											
2	BH9 - GW1	↓	↓	↓	↓	↓	✓	✓											
3	DUP	↓	↓	2	↓	↓		✓											
4	BH4 - SS2	S	↓	↓	SEPT. 03/20	↓				✓									
5	BH5 - SS2	↓	↓	↓	↓	↓				✓									
6	BH8 - AU1	↓	↓	↓	↓	↓				✓									
7	DUP. ← BTEX ONLY !	↓	↓	X 9	↓	↓	✓ BTEX												
8																			
9																			
10																			

Comments:

Relinquished By (Sign): [signature]	Received By Driver/Depot: M. DEJOIE	Received at Lab: Suneeporn Odhnaj	Method of Delivery: PARACEL COURIER
Relinquished By (Print): Dominic Landry	Date/Time: 17/09/20 4:00	Date/Time: Sept 17, 2020 04:39	Verified By: [signature]
Date/Time: SEPT 17/2020	Temperature: °C	Temperature: 9.2 °C	Date/Time: Sept 17, 2020 17:18
			pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 30844
Project: PE4169
Custody: 128184

Report Date: 21-Sep-2020
Order Date: 17-Sep-2020

Order #: 2038557

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

Paracel ID	Client ID
2038557-01	BH2-GW1
2038557-02	BH9-GW1
2038557-03	DUP

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30844

Report Date: 21-Sep-2020

Order Date: 17-Sep-2020

Project Description: PE4169

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	18-Sep-20	19-Sep-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Sep-20	18-Sep-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	18-Sep-20	19-Sep-20

Certificate of Analysis

Report Date: 21-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

	Client ID:	BH2-GW1	BH9-GW1	DUP	-
	Sample Date:	11-Sep-20 09:00	11-Sep-20 09:00	11-Sep-20 09:00	-
	Sample ID:	2038557-01	2038557-02	2038557-03	-
	MDL/Units	Water	Water	Water	-
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	-
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	17.8	<0.5	<0.5	-
Ethylene dibromide (dibromoethane, 1,2-)	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	-
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	-

Certificate of Analysis

Report Date: 21-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

	Client ID:	BH2-GW1	BH9-GW1	DUP	-
	Sample Date:	11-Sep-20 09:00	11-Sep-20 09:00	11-Sep-20 09:00	-
	Sample ID:	2038557-01	2038557-02	2038557-03	-
	MDL/Units	Water	Water	Water	-
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	41.9	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	41.9	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	97.2%	119%	122%	-
Dibromofluoromethane	Surrogate	115%	112%	114%	-
Toluene-d8	Surrogate	114%	111%	108%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	371	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-

Certificate of Analysis

Report Date: 21-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2020

Client PO: 30844

Project Description: PE4169

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
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						
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	*96.0*		*ug/L*		*120*	*50-140*			
Surrogate: Dibromofluoromethane	*93.7*		*ug/L*		*117*	*50-140*			
Surrogate: Toluene-d8	*89.3*		*ug/L*		*112*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	5.02	0.5	ug/L	4.29			15.7	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	10.9	0.5	ug/L	10.1			7.3	30	
Dibromochloromethane	2.90	0.5	ug/L	2.18			28.3	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	1.00	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*93.4*		*ug/L*		*117*	*50-140*			
Surrogate: Dibromofluoromethane	*92.8*		*ug/L*		*116*	*50-140*			
Surrogate: Toluene-d8	*89.0*		*ug/L*		*111*	*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)	1960	25	ug/L	ND	97.8	68-117			
F2 PHCs (C10-C16)	1510	100	ug/L	ND	94.6	60-140			
F3 PHCs (C16-C34)	4280	100	ug/L	ND	109	60-140			
F4 PHCs (C34-C50)	3060	100	ug/L	ND	123	60-140			
Volatiles									
Acetone	72.5	5.0	ug/L	ND	72.5	50-140			
Benzene	42.7	0.5	ug/L	ND	107	60-130			
Bromodichloromethane	43.8	0.5	ug/L	ND	110	60-130			
Bromoform	40.6	0.5	ug/L	ND	102	60-130			
Bromomethane	33.8	0.5	ug/L	ND	84.5	50-140			
Carbon Tetrachloride	45.0	0.2	ug/L	ND	113	60-130			
Chlorobenzene	38.8	0.5	ug/L	ND	97.0	60-130			
Chloroform	42.9	0.5	ug/L	ND	107	60-130			
Dibromochloromethane	43.9	0.5	ug/L	ND	110	60-130			
Dichlorodifluoromethane	34.2	1.0	ug/L	ND	85.5	50-140			
1,2-Dichlorobenzene	43.7	0.5	ug/L	ND	109	60-130			
1,3-Dichlorobenzene	42.9	0.5	ug/L	ND	107	60-130			
1,4-Dichlorobenzene	43.7	0.5	ug/L	ND	109	60-130			
1,1-Dichloroethane	41.8	0.5	ug/L	ND	104	60-130			
1,2-Dichloroethane	37.0	0.5	ug/L	ND	92.6	60-130			
1,1-Dichloroethylene	42.9	0.5	ug/L	ND	107	60-130			
cis-1,2-Dichloroethylene	43.0	0.5	ug/L	ND	108	60-130			
trans-1,2-Dichloroethylene	43.6	0.5	ug/L	ND	109	60-130			
1,2-Dichloropropane	39.8	0.5	ug/L	ND	99.4	60-130			
cis-1,3-Dichloropropylene	39.7	0.5	ug/L	ND	99.3	60-130			
trans-1,3-Dichloropropylene	36.7	0.5	ug/L	ND	91.8	60-130			
Ethylbenzene	39.6	0.5	ug/L	ND	99.1	60-130			
Ethylene dibromide (dibromoethane, 1,2-	37.9	0.2	ug/L	ND	94.8	60-130			
Hexane	42.2	1.0	ug/L	ND	106	60-130			
Methyl Ethyl Ketone (2-Butanone)	80.2	5.0	ug/L	ND	80.2	50-140			
Methyl Isobutyl Ketone	93.4	5.0	ug/L	ND	93.4	50-140			
Methyl tert-butyl ether	94.3	2.0	ug/L	ND	94.3	50-140			
Methylene Chloride	40.7	5.0	ug/L	ND	102	60-130			
Styrene	36.7	0.5	ug/L	ND	91.7	60-130			
1,1,1,2-Tetrachloroethane	38.8	0.5	ug/L	ND	96.9	60-130			
1,1,2,2-Tetrachloroethane	47.0	0.5	ug/L	ND	118	60-130			
Tetrachloroethylene	39.1	0.5	ug/L	ND	97.7	60-130			
Toluene	40.1	0.5	ug/L	ND	100	60-130			
1,1,1-Trichloroethane	43.1	0.5	ug/L	ND	108	60-130			
1,1,2-Trichloroethane	41.7	0.5	ug/L	ND	104	60-130			
Trichloroethylene	40.3	0.5	ug/L	ND	101	60-130			
Trichlorofluoromethane	44.7	1.0	ug/L	ND	112	60-130			
Vinyl chloride	36.4	0.5	ug/L	ND	91.0	50-140			
m,p-Xylenes	82.2	0.5	ug/L	ND	103	60-130			
o-Xylene	41.8	0.5	ug/L	ND	105	60-130			
Surrogate: 4-Bromofluorobenzene	*83.5*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*91.2*		*ug/L*		*114*	*50-140*			
Surrogate: Toluene-d8	*80.5*		*ug/L*		*101*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2038557

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2038557-Water 2038558-Soil	Nº 128184

Client Name: PATERSON	Project Ref: PE4169	Page __ of __
Contact Name: MARK D'ARCY	Quote #:	**Turnaround Time**
Address: 154 COLONNADE Rd. S. OTTAWA, ONT.	PO #: 30844	☐ 1 day ☐ 3 day ☐ 2 day ☐ Regular
Telephone: (613) 226-7381	E-mail: Mdarcy@PATERSONGroup.ca	Date Required:

Regulation 153/04	Other Regulation	Matrix Type
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO	S (Soil/Sed.) GW (Ground Water)
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA	SW (Surface Water) SS (Storm/Sanitary Sewer)
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm	P (Paint) A (Air) O (Other)
☐ Table ___	Mun: ___	
For RSC: ☐ Yes ☐ No	☐ Other:	

Required Analysis

#	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH2-GW1	GW	\	3	SEPT. 11/20	\	✓	✓											
2	BH9-GW1	↓	↓	↓	↓	↓	✓	✓											
3	DUP	↓	↓	2	↓	↓		✓											
4	BH4-SS2	S	↓	↓	SEPT. 03/20	↓				✓									
5	BH5-SS2	↓	↓	↓	↓	↓				✓									
6	BH8-AU1	↓	↓	↓	↓	↓	✓			✓									
7	DUP. ← BTEX ONLY!	↓	↓	~~1~~ 2	↓	↓	BTEX												
8																			
9																			
10																			

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): [signature]	Received By Driver/Depot: [signature]	Received at Lab: Suneepovn Dohmai	Verified By: [signature]
Relinquished By (Print): Dominic Landry	Date/Time: 17/09/20 4:00	Date/Time: Sep 17, 2020 04:38	Date/Time: Sept 17, 2020 17:18
Date/Time: SEPT 17/2020	Temperature: °C PH	Temperature: 9.2 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mandy Witteman

Client PO: 30853
Project: PE4169
Custody: 128188

Report Date: 23-Sep-2020
Order Date: 21-Sep-2020

Order #: 2039103

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

Paracel ID	Client ID
2039103-01	MW-4-GW2
2039103-02	MW-15-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30853

Report Date: 23-Sep-2020

Order Date: 21-Sep-2020

Project Description: PE4169

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	23-Sep-20	23-Sep-20
PHC F1	CWS Tier 1 - P&T GC-FID	22-Sep-20	23-Sep-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	22-Sep-20	22-Sep-20

Certificate of Analysis

Report Date: 23-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Sep-2020

Client PO: 30853

Project Description: PE4169

	Client ID:	MW-4-GW2	MW-15-GW1	-	-
	Sample Date:	21-Sep-20 10:30	21-Sep-20 10:30	-	-
	Sample ID:	2039103-01	2039103-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	106%	105%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30853

Report Date: 23-Sep-2020

Order Date: 21-Sep-2020

Project Description: PE4169

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*82.2*		*ug/L*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*83.5*		*ug/L*		*104*	*50-140*			

Certificate of Analysis

Report Date: 23-Sep-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Sep-2020

Client PO: 30853

Project Description: PE4169

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1770	25	ug/L	ND	88.6	68-117			
F2 PHCs (C10-C16)	1750	100	ug/L	ND	109	60-140			
F3 PHCs (C16-C34)	4680	100	ug/L	ND	119	60-140			
F4 PHCs (C34-C50)	2840	100	ug/L	ND	114	60-140			
Volatiles									
Benzene	35.7	0.5	ug/L	ND	89.3	60-130			
Ethylbenzene	31.2	0.5	ug/L	ND	77.9	60-130			
Toluene	33.3	0.5	ug/L	ND	83.2	60-130			
m,p-Xylenes	69.1	0.5	ug/L	ND	86.4	60-130			
o-Xylene	31.7	0.5	ug/L	ND	79.2	60-130			
Surrogate: Toluene-d8	*73.9*		*ug/L*		*92.4*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARACE LABORATORIES L

Paracel ID: 2039103

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2039103	Nº 128188

Client Name: Paterson Group Inc.
Contact Name: Mandy Witteman / Mark D'Arcy
Address: 154 Colonnade Road, S.
Telephone: (613) 226-7381

Project Ref: PE4169
Quote #:
PO #: 30853
E-mail: mwitteman@patersongroup.ca OR mdarcy@patersongroup.ca

Page 1 of 1

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

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☒ Table 2 ☒ Ind/Comm ☒ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table ___
For RSC: ☐ Yes ☐ No

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

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

Required Analysis: PHCs F1-F4+BTEX; VOCs; PAHs; Metals by ICP; Hg; CrVI; B (HWS); BTEX, PHC, F1

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	BTEX, PHC, F1
1	MW-4-GW2	GW		3	Sept. 21/20	10:30	X							
2	MW-15-GW1	GW		2	↓	↓								X
3														
4														
5														
6														
7														
8														
9														
10														

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Jumeepoorn Dolmai	Verified By:
Relinquished By (Print): Mandy Witteman	Date/Time:	Date/Time: Sept 21, 2020 05:00	Date/Time: 9-21-20 17:46
Date/Time: Sept. 21, 2020.	Temperature: °C	Temperature: 15.5 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mandy Witteman

Client PO: 30900
Project: PE4169
Custody: 128219

Report Date: 2-Oct-2020
Order Date: 30-Sep-2020

Order #: 2040418

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

Paracel ID	Client ID
2040418-01	BH2-GW2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 02-Oct-2020

Client: Paterson Group Consulting Engineers

Order Date: 30-Sep-2020

Client PO: 30900

Project Description: PE4169

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	2-Oct-20	2-Oct-20
PHC F1	CWS Tier 1 - P&T GC-FID	1-Oct-20	2-Oct-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	1-Oct-20	2-Oct-20

Certificate of Analysis

Report Date: 02-Oct-2020

Client: Paterson Group Consulting Engineers

Order Date: 30-Sep-2020

Client PO: 30900

Project Description: PE4169

	Client ID:	BH2-GW2	-	-	-
	Sample Date:	29-Sep-20 12:00	-	-	-
	Sample ID:	2040418-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	16.1	-	-	-
Toluene	0.5 ug/L	0.5	-	-	-
m,p-Xylenes	0.5 ug/L	24.1	-	-	-
o-Xylene	0.5 ug/L	1.4	-	-	-
Xylenes, total	0.5 ug/L	25.5	-	-	-
Toluene-d8	Surrogate	110%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	229	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30900

Report Date: 02-Oct-2020

Order Date: 30-Sep-2020

Project Description: PE4169

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*84.4*		*ug/L*		*105*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	187	25	ug/L	229			20.1	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	9.15	0.5	ug/L	16.1			55.0	30	QR-07
Toluene	ND	0.5	ug/L	0.51			NC	30	
m,p-Xylenes	12.7	0.5	ug/L	24.1			61.7	30	QR-07
o-Xylene	0.95	0.5	ug/L	1.39			NC	30	
Surrogate: Toluene-d8	*86.9*		*ug/L*		*109*	*50-140*			

Certificate of Analysis

Report Date: 02-Oct-2020

Client: Paterson Group Consulting Engineers

Order Date: 30-Sep-2020

Client PO: 30900

Project Description: PE4169

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1930	25	ug/L	ND	96.3	68-117			
F2 PHCs (C10-C16)	1900	100	ug/L	ND	119	60-140			
F3 PHCs (C16-C34)	4420	100	ug/L	ND	113	60-140			
F4 PHCs (C34-C50)	2960	100	ug/L	ND	119	60-140			
Volatiles									
Benzene	39.3	0.5	ug/L	ND	98.2	60-130			
Ethylbenzene	37.2	0.5	ug/L	ND	93.1	60-130			
Toluene	38.4	0.5	ug/L	ND	96.0	60-130			
m,p-Xylenes	77.4	0.5	ug/L	ND	96.8	60-130			
o-Xylene	37.8	0.5	ug/L	ND	94.4	60-130			
Surrogate: Toluene-d8	*76.8*		*ug/L*		*96.0*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARAC LABORATORIES

Paracel ID: 2040418

rent Blvd.
K1G 4J8
17
cellabs.com
s.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2041248	Nº 128219

Client Name: Paterson Group Inc.	Project Ref: PE4169	Page __ of __
Contact Name: Mandy Witteman	Quote #:	Turnaround Time
Address: 154 Colonnade Rd S. Ottawa ON	PO #: 30900	☐ 1 day ☐ 3 day
	E-mail: mwitteman@patersongroup.ca	☒ 2 day ☐ Regular
Telephone: (613) 226-7381		Date Required:

Regulation 153/04	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	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH2-GW2	GW		3	Sept. 29/20	Noon	X						
2													
3													
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: A. Jesse	Received at Lab:	Verified By:
Relinquished By (Print): Mandy Witteman	Date/Time: 30/09/20 3 21	Date/Time: 9-30-20 16:10	Date/Time: 09-30-20 16:25
Date/Time: Sept 30, 2020	Temperature: °C	Temperature: 15 °C	pH Verified: ☐ By: