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Phase II Environmental Site Assessment

377 and 381 Winona Avenue
Ottawa, Ontario

Prepared For

10731854 Canada Inc.

October 15, 2021

Report: PE5222-2

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for 377 and 381 Winona Avenue, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address five potentially contaminating activities (PCAs) that were identified during the Phase I ESA and were considered to result in areas of potential environmental concern (APECs) on the Phase II - Property. The subsurface investigation consisted of drilling five boreholes, all of which were completed as groundwater monitoring wells.

Soil samples were obtained from the boreholes and screened using visual observations and organic vapour measurements. Six soil samples including one duplicate, were submitted for laboratory analysis of petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene, xylene (BTEX), and/or volatile organic compounds (VOCs). All BTEX, PHC and VOC concentrations identified in the soil samples were in compliance with the applicable MECP Table 7 standards.

Six groundwater samples, including one duplicate sample, were obtained from the monitoring wells installed on the Phase II - Property and were analyzed for PHCs and VOCs. All of the identified PHC parameters were in compliance with the applicable MECP Table 7 standards. Groundwater impacted with VOC parameters cis-1,2-Dichloroethylene, Tetrachloroethylene and Trichloroethylene was identified in the monitoring wells installed in BH2-19, BH3-19, and BH4-21. Tetrachloroethylene impacts were also identified in the groundwater within BH1-19 and vinyl chloride impacts were identified in BH3-19.

Recommendations

Monitoring Wells

It is expected that the groundwater monitoring wells will be abandoned in accordance with O.Reg.903, at the time of construction excavation. It is recommended that the integrity of the monitoring wells be maintained, prior to future construction, for possible further groundwater monitoring purposes.

Risk Assessment

Based on the findings, the VOC impacted groundwater has migrated onto the property from an off-site source. Furthermore, it is expected that the groundwater quality is indicative of a regional groundwater plume and, as a result, it is not possible to remediate the subject property to generic standards. Given that a record of site condition is not required for the redevelopment of the property, it is recommended that a due diligence risk assessment be completed by a toxicology company to develop mitigative measures that may be warranted prior to the future redevelopment of the Phase II – Property. Paterson will provide the toxicology company with the data contained within the current assessment. This assessment assesses and addresses all potential risks associated with the VOC impacted water, including the potential for vapour intrusion.

1.0 INTRODUCTION

At the request of 10731854 Canada Inc., Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment for 377 and 381 Winona Avenue in the City of Ottawa, Ontario. The purpose of this Phase II ESA has been to address five areas of potential environmental concern (APECs) identified on the Phase II Property, during the Phase I ESA conducted by Paterson in August of 2021.

1.1 Site Description

Address:	377 and 381 Winona Avenue, Ottawa, Ontario.
Legal Description:	Plan 184, Part of Lots 1, 2 & 3, in the City of Ottawa
Location:	The Phase II - Property is located on the east side of Winona Avenue, in the southeast quadrant of the Picton Avenue and Winona Avenue intersection, in the City of Ottawa, Ontario. The Phase I – Property is shown on Figure 1 - Key Plan following the body of this report.
Latitude and Longitude:	45° 23' 35" N, 75° 45' 11" W
Site Description:	
Configuration:	Rectangular
Site Area:	938 m^2 (approximate)

1.2 Property Ownership

Paterson was engaged to conduct this Phase I – ESA by Mr. Raphael Esposito of 10731854 Canada Inc. Mr. Esposito can be contacted via his mailing address at 555 Legget Drive, Suite 304, in the City of Ottawa, Ontario.

1.3 Current and Proposed Future Uses

The Phase II – Property is occupied by two, two-storey residential dwellings. The study area consists of a mixture of commercial and residential properties. It is our understanding that the Phase II - Property is to be redeveloped for residential purposes.

1.4 Applicable Site Condition Standard

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

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

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

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II - Property is located in a mixed residential and commercial area and is located on the east side of Winona Avenue, in the southeast quadrant of the Picton Avenue and Winona Avenue intersection, in the City of Ottawa, Ontario. The neighbouring properties are used primarily for residential and commercial purposes with a church and school being located further east of the Phase II – Property.

The general area of the Phase II – Property slopes significantly down towards the north in the general direction of the Ottawa River. Site drainage consists primarily of surface runoff towards manholes located along Winona Avenue and Picton Avenue.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigations were conducted on June 4, 2019, September 10, 2021, and September 13, 2021.

The field program consisted of drilling five boreholes, all of which were instrumented with groundwater monitoring wells.

The boreholes were drilled to a maximum depth of 8.79 m below the existing grade.

3.2 Media Investigated

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

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, bedrock in the area of the site consists of limestone and dolomite of the Gull River Formation. Based on the maps, the thickness of overburden ranges from 2 to 3 m. Overburden reportedly consists of till deposits.

Contaminants of Potential Concern

The contaminants of potential concern resulting from the identified APECs are as follows:

- Petroleum Hydrocarbons (PHCs (F_1-F_4))
- Benzene, toluene, ethylbenzene, and xylene (BTEX)
- Volatile organic compounds (VOCs)

Existing Buildings and Structures

The Phase I - Property is primarily occupied by two, two-storey residential dwellings with full basements. The buildings are heated using natural gas fired furnaces located in the basement of the residential dwellings. One storage shed is located in the backyard of 377 Winona Avenue and a two-stall detached garage is located to the southeast of the residential dwelling addressed 381 Winona Avenue.

Water Bodies

There are no water bodies on the Phase II - Property or within the Phase I ESA study area.

Areas of Natural Significance

There are no areas of natural and scientific interest on the subject property or within the Phase I ESA study area.

Water Well Records

Three monitoring wells installed as part of the 2019 Phase II – ESA were observed on the southern portion of the Phase I – Property addressed 381 Winona Avenue. Based on a search of the MECP well records mapping site, 17 water well records were identified within a 250 m radius of the Phase I Property.

All of the reported wells were groundwater monitoring wells, drilled between 2002 and 2017. Based on the distances of the monitoring wells from the Phase I - Property, and previous investigations completed in the Phase I Study Area, they are not considered to represent PCAs.

Neighbouring Land Use

Neighbouring land use in the Phase I study area consists primarily of residential and commercial properties with occasional community use properties.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

22 PCAs were identified within the Phase I study area. Based on their separation distances and cross or down gradient orientation with respect to the subject site, the above noted PCAs, except for the historical printer on the adjacent property to the south, the former retail fuel outlets located along Richmond Road, the former dry cleaner and former automotive service garage, are not considered to result in APECs on the Phase I – Property.

Assessment of Uncertainty and/or Absence of Information

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

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

3.4 Deviations from Sampling and Analysis Plan

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

3.5 Impediments

Physical impediments encountered during the field program included a large hedge that enclosed the entire property and overheard services located on the northern portion of the property.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigations were conducted on June 4, 2019, September 10, 2021 and September 13, 2021. The field program consisted of drilling five boreholes on the Phase II Property, all of which were completed with monitoring well installations. The boreholes that were installed during the 2019 program are labelled as BH1-19, BH2-19, and B3-19. It should however be noted that the soil and initial groundwater samples from the boreholes installed in 2019 were submitted as BH1, BH2 and BH3 and are indicated as such in the laboratory certificates of analysis.

The boreholes installed during the 2021 subsurface investigation are labelled as BH4-21 and BH5-21. It should however be noted that the soil and groundwater samples from the boreholes installed in 2021 were submitted as BH1-21 and BH2-21 and are indicated as such in the laboratory certificates of analysis.

The boreholes were placed to address the aforementioned areas of potential environmental concern (APECs). The boreholes were drilled with a L.A.D, operated by CCC Drilling Ltd., under the full-time supervision of Paterson personnel. Borehole locations are shown on Drawing PE5222-3 – Test Hole Location Plan appended to this report.

4.2 Soil Sampling

A total of 10 soil samples were obtained from the boreholes by means of sampling from shallow auger flights ansd split spoon sampling.

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.

Site soils generally consist of 0.36 m of topsoil, over approximately 0.30 m of granular fill material encountered in BH1 -19 and BH2-19.

Native glacial till with a brown silty sand matrix extended to depths ranging from 0.76 to 1.45 m underlain by interbedded grey limestone bedrock extending to depths ranging from 7.01 to 8.79 m. All boreholes were terminated within the bedrock.

4.3 Field Screening Measurements

Soil samples recovered at the time of sampling were placed immediately into airtight plastic bags with nominal headspace.

All lumps of soil inside the bags were broken by hand, and the soil was allowed to come to room temperature prior to conducting the vapour survey. Allowing the samples to stabilize to room temperature ensures consistency of readings between samples.

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

The PID readings were found to range from 0 to 0.5 ppm in the soil samples obtained. These results do not indicate the potential for significant contamination from volatile contaminants. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

4.4 Groundwater Monitoring Well Installation

Five groundwater monitoring wells were installed on the Phase II Property as part of the subsurface investigation. The monitoring wells consisted of 32 mm diameter Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 1 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

Table 1: 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
BH1-19	68.46	8.38	5.38-8.38	4.60-8.38	0-4.6	Flush Mount
BH2-19	68.45	8.76	5.76-8.76	5.2-8.76	0-5.2	Flush Mount
BH3-19	66.92	8.79	5.79-8.79	5.2-8.79	0-5.2	Flush Mount
BH4-21	67.08	7.85	4.85-7.85	4.2-7.85	0-4.2	Flush Mount
BH5-21	67.13	7.01	4.01-7.01	3.6-7.01	0-3.6	Flush Mount

4.5 Field Measurement of Water Quality Parameters

Groundwater sampling was conducted on September 17, 2021, as well as September 22, 2021. Water quality parameters were not obtained at the time of the sampling event due to minimal groundwater volumes within each of the sampled wells.

4.6 Groundwater Sampling

Groundwater sampling protocols were followed using the MECP document entitled “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario,” dated May 1996. Groundwater samples were obtained from each monitoring well, using dedicated sampling equipment.

Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation.

Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.7 Analytical Testing

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

Table 2: Soil Samples Submitted

Sample ID	Screened Interval/ Stratigraphic Unit	Parameter Analyzed			Rationale
		PHCs ($F_1 – F_4$)	BTEX	VOCs	
BH1-19-SS2	0.75-1.4 m Native brown silty sand glacial till	X	X	X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner and former BP petroleum products)
BH2-19-SS2	0.75-1.4 m Native brown silty sand glacial till	X	X		Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner and former BP petroleum products)
BH3-19-SS2	0.75-1.4 m Native brown silty sand glacial till	X	X		Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner and former BP petroleum products)
BH4-21-SS2	0.46-0.76 Native brown silty sand glacial till	X	X	X	Assess APECs 1 and 4 (Former printer and former drycleaner,)
BH5-21-SS3	0.36-0.91 m Native brown silty sand glacial till	X	X	X	Assess APECs 1 and 4 (Former printer and former drycleaner,)
DUP-1 (Duplicate of BH4-21-SS2)	0.46-0.76 Native brown silty sand glacial till	X			Assess APECs 1 and 4 (Former printer and former drycleaner,)

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

Table 3: Groundwater Samples Submitted

Sample ID	Screened Interval/ Stratigraphic Unit	Parameters Analyzed		Rationale
		PHCs ($F_1 – F_4$)	VOCs	
BH1-19-GW1	5.38-8.38 Grey limestone bedrock	X	X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner, and former BP petroleum products)
BH2-19-GW1	5.76-8.76 Grey limestone bedrock	X	X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner, and former BP petroleum products)
BH3-19-GW1	5.79-8.79 Grey limestone bedrock	X	X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner, and former BP petroleum products)

Table 3: Groundwater Samples Submitted

Sample ID	Screened Interval/ Stratigraphic Unit	Parameters Analyzed		Rationale
		PHCs ($F_1 – F_4$)	VOCs	
BH1-19-GW2	5.38-8.38 Grey limestone bedrock		X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner, and former BP petroleum products)
BH2-19-GW2	5.76-8.76 Grey limestone bedrock		X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner, and former BP petroleum products)
BH3-19-GW2	5.79-8.79 Grey limestone bedrock		X	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner, and former BP petroleum products)
BH4-21-GW1	4.85-7.85 Grey limestone bedrock	X	X	Assess APEC 1 and 4 (Former printer and former drycleaner,)
BH5-21-GW1	4.01-7.01 Grey limestone bedrock	X	X	Assess APEC 1 and 4 (Former printer and former drycleaner,)
DUP1-GW1*	4.85-7.85 Grey limestone bedrock	X		QA/QC

- * - Duplicate of BH4-GW1

Paracel Laboratories (Paracel) of Ottawa, Ontario, performed the laboratory analysis on the samples submitted for analytical testing.

Paracel is a member of the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA). Paracel is accredited and certified by SCC/CALA for specific tests registered with the association.

4.8 Residue Management

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

4.9 Elevation Surveying

Boreholes were surveyed to geodetic elevations by Paterson personnel.

4.10 Quality Assurance and Quality Control Measures

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

5.0 REVIEW AND EVALUATION

5.1 Geology

The soil profile generally consists of approximately 0.36 m of topsoil or 0.08 m of asphaltic concrete followed by granular fill material in BH1-19 and BH2-19. Native brown silty sand glacial till extending to depths ranging from 0.76 to 1.45 m was encountered in all the boreholes. All of the boreholes were terminated in grey limestone bedrock that extended to depths ranging from 7.01 to 8.79 m

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling event on September 17, 2021, using an electronic water level meter. Groundwater levels are summarized below in Table 4. All elevations were acquired through a GPS survey completed at the time of the subsurface investigation.

Table 4: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (Asl)	Date of Measurement
BH1-19	68.46	5.04	63.42	September 17, 2021
BH2-19	68.45	5.34	63.11	
BH3-19	66.92	5.24	61.68	
BH4-21	67.08	5.12	61.96	
BH5-21	67.13	4.16	62.97	

5.3 Fine-Coarse Soil Texture

No grain size analysis was completed for the Phase II - Property. Coarse-grained standards were selected based on the observed stratigraphy.

5.4 Soil: Field Screening

Field screening of the soil samples collected during drilling resulted in vapour readings ranging from 0 to 0.3 ppm.

No visual or olfactory indications of potential contamination were identified in the soil samples at the time of the field program. 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 soil samples including one duplicate were submitted for analysis of PHCs (F_1-F_4), BTEX and VOCs. The results of the analytical testing are presented below in Tables 5 and 6. The laboratory certificates of analysis are provided in Appendix 1. Analytical test results are shown on Drawing PE5222- 4 – Analytical Testing Plan.

Table 5: Analytical Test Results – Soil – PHCs (F_1-F_4) and BTEX

Parameter	MDL (µg/g)	Soil Samples (µg/g)					MECP Table 7 Residential Standards (µg/g)
		June 4/2019			September 10 and 13/2021		
		BH1-19-SS2	BH2-19-SS2	BH3-19-SS2	BH4-21-SS2*	BH5- 21-SS3	
Benzene	0.02	nd	nd	nd	nd	nd	0.21
Ethylbenzene	0.05	nd	nd	nd	nd	nd	2
Toluene	0.05	nd	nd	nd	nd	nd	2.3
Xylenes, total	0.05	nd	nd	nd	nd	nd	3.1
F1 PHCs (C6-C10)	7	nd	nd	nd	nd	nd	55
F2 PHCs (C10-C16)	4	nd	nd	nd	nd	nd	98
F3 PHCs (C16-C34)	8	39	47	nd	nd	nd	300
F4 PHCs (C34-C50)	6	97	133	nd	nd	nd	2800

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- NA – Parameter not analysed
- * - Duplicate of BH1-21-SS2
- **Bold and Underlined** – Results exceed the selected MECP standards

All of the analyzed PHC and BTEX parameters were non-detect with the exception of PHC fractions F_3 and F_4 in the samples obtained from BH1-19 and BH2-19, which are in compliance with the applicable MECP Table 7 standards.

Table 6: Analytical Test Results – Soil - VOCs

Parameter	MDL (µg/g)	Soil Sample (µg/g)				MECP Table 7 Residential Coarse Standards (µg/g)
		June 4/2019	September 10 and 13/2021			
		BH1-19-SS2	BH4-21-SS2	BH5-21-SS3	DUP	
Acetone	0.50	nd	nd	nd	nd	16
Benzene	0.02	nd	nd	nd	nd	0.21
Bromodichloromethane	0.05	nd	nd	nd	nd	13
Bromoform	0.05	nd	nd	nd	nd	0.27
Bromomethane	0.05	nd	nd	nd	nd	0.05
Carbon Tetrachloride	0.05	nd	nd	nd	nd	0.05
Chlorobenzene	0.05	nd	nd	nd	nd	2.4
Chloroform	0.05	nd	nd	nd	nd	0.05
Dibromochloromethane	0.05	nd	nd	nd	nd	9.4
Dichlorodifluoromethane	0.20	nd	nd	nd	nd	16
1,2-Dichlorobenzene	0.05	nd	nd	nd	nd	3.4
1,3-Dichlorobenzene	0.05	nd	nd	nd	nd	4.8
1,4-Dichlorobenzene	0.05	nd	nd	nd	nd	0.083
1,1-Dichloroethane	0.05	nd	nd	nd	nd	3.5
1,2-Dichloroethane	0.05	nd	nd	nd	nd	0.05
1,1-Dichloroethylene	0.05	nd	nd	nd	nd	0.05
cis-1,2-Dichloroethylene	0.05	nd	nd	nd	nd	3.4
trans-1,2-Dichloroethylene	0.05	nd	nd	nd	nd	0.084
1,2-Dichloropropane	0.05	nd	nd	nd	nd	0.05
cis-1,3-Dichloropropylene	0.05	nd	nd	nd	nd	nd
trans-1,3-Dichloropropylene	0.05	nd	nd	nd	nd	nd
1,3-Dichloropropene, total	0.05	nd	nd	nd	nd	0.05
Ethylbenzene	0.5	nd	nd	nd	nd	2
Ethylene dibromide	0.5	nd	nd	nd	nd	0.05
Hexane	0.05	nd	nd	nd	nd	2.8
Methyl Ethyl Ketone	0.05	nd	nd	nd	nd	16
Methyl Isobutyl Ketone	0.05	nd	nd	nd	nd	1.7
Methyl tert-butyl ether	0.50	nd	nd	nd	nd	0.75
Methylene Chloride	0.05	nd	nd	nd	nd	0.1
Styrene	0.05	nd	nd	nd	nd	0.7
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	0.058
1,1,2,2-Tetrachloroethane	0.05	nd	nd	nd	nd	0.05
Tetrachloroethylene	0.05	nd	nd	nd	nd	0.28
Toluene	0.05	nd	nd	nd	nd	2.3
1,1,1-Trichloroethane	0.05	nd	nd	nd	nd	0.38
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	0.05
Trichloroethylene	0.02	nd	nd	nd	nd	0.061
Trichlorofluoromethane	0.05	nd	nd	nd	nd	4
Vinyl Chloride	0.02	nd	nd	nd	nd	0.02
Xylenes, total	0.05	nd	nd	nd	nd	3.1

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **Bold and underlined** – parameter exceeds MECP Table 7

All of the analyzed VOC parameters were non-detect and therefore in compliance with the applicable MECP Table 7 standards.

TABLE 7: Maximum Concentrations – Soil			
Parameter	**Maximum Concentration (µg/g)**	**Soil Sample**	**Depth Interval (m BGS)**
F3 PHCs (C16-C34)	47	BH2-19-SS2	0.75–1.4, Native
F4 PHCs (C34-C50)	133	BH2-19-SS2	0.75-1.4, Native
Notes: ▪ **Bold and Underlined** – Results exceed the selected MECP standards			

All other analyzed parameters were non-detect.

5.6 Groundwater Quality

Groundwater samples from monitoring wells installed in BH1-19, BH2-19, BH3-19, BH1-21, BH2-21 and BH3-21 were submitted for laboratory analysis of PHCs (F_1-F_4), BTEX and VOCs.

The groundwater samples were obtained from the screened intervals noted in Table 4. The results of the analytical testing are presented below in Tables 8 and Table 9. The laboratory certificate of analysis is provided in Appendix 1. Analytical test results are shown on Drawing PE5222- 5 – Analytical Testing Plan – Groundwater.

Table 8: Analytical Test Results – Groundwater – PHCs (F_1-F_4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)						MECP Table 7 Residential Standards (µg/L)
		June 11, 2019			September 17, 2021			
		BH1-19-GW1	BH2-19-GW1	BH3-19-GW1	BH4-21-GW1	BH5-21-GW1	DUP 1-GW1	
F1 PHCs (C6-C10)	25	nd	nd	80	nd	37	37	420
F2 PHCs (C10-C16)	100	nd	nd	nd	nd	nd	nd	150
F3 PHCs (C16-C34)	100	nd	nd	nd	nd	nd	nd	500
F4 PHCs (C34-C50)	100	nd	nd	nd	nd	nd	nd	500

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- * Duplicate sample of BH4-21-GW1

The majority of the PHC concentrations were identified as being non-detect with the exception of fraction F_1 identified in BH4-GW1 and DUP1-GW1 which was in compliance with the MECP Table 7 Standards.

Table 9: Analytical Test Results – Groundwater – VOCs

Parameter	MDL (µg/L)	Water Samples (µg/L)								MECP Table 7 Residential Standards (µg/L)
		June 10 and 13/02019			September 17 and 22, 2021					
		BH1-19-GW1	BH2-19-GW1	BH3-19-GW1	BH1-19-GW2	BH2-19-GW2	BH3-19-GW2	BH4-21-GW1	BH5-21-GW1	
Acetone	5.0	nd	nd	nd	nd	nd	nd	nd	nd	100000
Benzene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
Bromodichloromethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	67000
Bromoform	0.5	nd	nd	nd	nd	nd	nd	nd	nd	5
Bromomethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.89
Carbon Tetrachloride	0.2	nd	nd	nd	nd	nd	nd	nd	nd	0.2
Chlorobenzene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	140
Chloroform	0.5	nd	1.3	1.7	nd	nd	nd	nd	nd	2
Dibromochloromethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	65000
Dichlorodifluoromethane	1.0	nd	nd	nd	nd	nd	nd	nd	nd	3500
1,2-Dichlorobenzene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	150
1,3-Dichlorobenzene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	7600
1,4-Dichlorobenzene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
1,1-Dichloroethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	11
1,2-Dichloroethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
1,1-Dichloroethylene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
cis-1,2-Dichloroethylene	0.5	**13.7**	**63.2**	**74.3**	nd	**120**	**94.9**	**93**	nd	1.6
trans-1,2-Dichloroethylene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	1.6
1,2-Dichloropropane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.58
cis-1,3-Dichloropropylene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	
trans-1,3-Dichloropropylene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	
1,3-Dichloropropene, total	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
Ethylbenzene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	54
Ethylene dibromide (dibromoethane, 1,2-)	0.2	nd	nd	nd	nd	nd	nd	nd	nd	0.2
Hexane	1.0	nd	nd	nd	nd	nd	nd	nd	nd	5
Methyl Ethyl Ketone (2-Butanone)	5.0	nd	nd	nd	nd	nd	nd	nd	nd	21000
Methyl Isobutyl Ketone	5.0	nd	nd	nd	nd	nd	nd	nd	nd	5200
Methyl tert-butyl ether	2.0	nd	nd	nd	nd	nd	nd	nd	nd	15
Methylene Chloride	5.0	nd	nd	nd	nd	nd	nd	nd	nd	26
Styrene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	43
1,1,1,2-Tetrachloroethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	1.1
1,1,2,2-Tetrachloroethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
Tetrachloroethylene	0.5	**35.8**	**150**	**418**	**5.6**	**155**	**144**	**122**	nd	0.5
Toluene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	320
1,1,1-Trichloroethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	23
1,1,2-Trichloroethane	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5
Trichloroethylene	0.5	**6.0**	**31.6**	**15**	nd	**55.8**	**44.1**	**42.1**	nd	0.5
Trichlorofluoromethane	1.0	nd	nd	nd	nd	nd	nd	nd	nd	2000
Vinyl Chloride	0.5	nd	nd	**0.8**	nd	nd	**7.1**	nd	nd	0.5
m/p-Xylene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	
o-Xylene	0.5	nd	nd	nd	nd	nd	nd	nd	nd	
Xylenes, total	0.5	nd	nd	nd	nd	nd	nd	nd	nd	72

Notes:
- MDL - Method Detection Limit
- nd - Not Detected (< MDL)
- **Bold and underlined** – parameter exceeds MECP Table 7

Groundwater impacted with VOC parameters cis-1,2-Dichloroethylene, Tetrachloroethylene and Trichloroethylene were identified in the monitoring wells installed in BH1-19, BH2-19, BH3-19, and BH4-21. Vinyl chloride impacts were also identified in BH1-19 and BH3-19.

TABLE 10: Maximum Concentrations – Groundwater			
Parameter	**Maximum Concentration (µg/L)**	**Soil Sample**	**Depth Interval (m BGS)**
cis-1,2-Dichloroethylene	120	BH2-19-GW2	5.76-8.76 Limestone bedrock
Tetrachloroethylene	155	BH2-19-GW2	5.76-8.76 Limestone bedrock
Trichloroethylene	55.8	BH2-19-GW2	5.76-8.76 Limestone bedrock
Vinyl Chloride	7.1	BH3-19-GW2	5.79-8.79 Limestone bedrock
F1 PHCs (C6-C10)	80	BH3-19-GW1	5.79-8.79 Limestone bedrock
Notes: ▪ **Bold and Underlined** – Results exceed the selected MECP standards			

5.7 Quality Assurance and Quality Control Results

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

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

As per the Sampling and Analysis Plan, a duplicate soil sample was obtained from sample BH4-21-SS2 and submitted for laboratory analysis of PHCs (F_1-F_4). The analyzed PHC fractions were identified as being non-detect in both the duplicate and original samples. Based on the analyzed PHC parameters being identified as non-detect in the original and duplicate samples, the results are considered to be acceptable.

A duplicate groundwater sample was obtained from the monitoring well installed in BH4-21 and submitted for laboratory analysis of PHC parameters. Both the duplicate and original sample had a low concentration of fraction F_1 that had an RPD value of zero.

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

5.8 Phase II Conceptual Site Model

The following section has been prepared in accordance with the requirements of O.Reg. 269/11 amended by the Environmental Protection Act. Conclusions and recommendations are discussed in a subsequent section.

Site Description

The Phase II Property is currently occupied by two, two-storey residential dwellings. One storage shed is located in the backyard of 377 Winona Avenue and a two-stall detached garage is located to the southeast of the residential dwelling addressed 381 Winona Avenue.

The eastern portion of the property exists as landscaped grass areas with laneways being present on the western side of both of the residential dwellings.

Potentially Contaminating Activity and Areas of Potential Environmental Concern

As indicated in the Phase I-ESA report, the following off-site PCAs were considered to result in APECs on the Phase I/Phase II Property:

- Former Printers
- Historical gasoline service station.
- Former automotive service garage.
- Former dry cleaners.
- Former BP petroleum products.

Contaminants of Potential Concern and Impacted Media

Contaminants of potential concern associated with the PCAs include PHCs (F1-F4), BTEX and VOCs in the soil and groundwater.

Subsurface Structures and Utilities

Underground service locates were completed prior to the subsurface investigation. Underground utilities on the Phase II - Property include private electrical, water and sewer services as well as hydro and gas lines.

Physical Setting

Site Stratigraphy

The site stratigraphy, from the ground surface to the deepest aquifer or aquitard investigated consists of:

- Asphaltic concrete from 0 to 0.08 m, overlaying fill material consisting of brown silty sand with crushed stone was extending to depths of 0.30 m was only encountered in BH1-19 and BH2-19
- Topsoil extending to depths ranging from 0.36 to 0.46 m.
- Native brown silty sand glacial till extending to depths ranging from 0.76 to 1.45 m
- Grey limestone bedrock extending to depths ranging from 7.01 to 8.79 m.

Hydrogeological Characteristics

Groundwater at the Phase II - Property was encountered within the bedrock.

Water levels were measured at the Phase II - Property on September 17, 2021, at depths ranging from 4.16 to 5.34 m below grade.

Based on the groundwater levels recorded, the groundwater appears to flow in a northwesterly direction.

Approximate Depth to Bedrock

Bedrock was encountered at an average depth of 1.15 m below the existing grade.

Approximate Depth to Water Table

Depth to the water table at the Phase II - Property varies between approximately 4.16 to 5.34 m below the existing grade.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the subject site.

Section 43.1 of the Regulation does apply to the Phase II - Property in that the Phase II - Property is a Shallow Soil Property.

Fill Placement

A surficial covering of asphaltic concrete or topsoil was identified in all of the boreholes. Fill material ranging from 0.28 to 0.30 m and consisting of brown silty sand and crushed stone was identified in BH1-19 and BH2-19 beneath the asphaltic concrete laneway to the south of 381 Winona Avenue. This is considered to be engineered fill which is part of the pavement structure.

Proposed Buildings and Other Structures

It is our understanding that the Phase II - Property is to be redeveloped for residential purposes.

Areas of Natural Significance and Water Bodies

No areas of natural significance are present on or within the vicinity of the Phase II - Property.

There are no water bodies on the subject property, or within the Phase I ESA study area.

Environmental Condition

Areas Where Contaminants are Present

Groundwater impacted with VOC parameters cis-1,2-Dichloroethylene, Tetrachloroethylene and Trichloroethylene were identified in the monitoring wells installed on the southern portion of the Phase II – Property (BH1-19, BH2-19 and BH3-19).

Types of Contaminants

Cis-1,2-Dichloroethylene, Tetrachloroethylene, Trichloroethylene and vinyl chloride were identified in the groundwater in 4 of the monitoring wells.

Contaminated Media

All of the soil complies with the applicable Table 7 standards. Based on the findings of this Phase II ESA, select VOC parameters identified in the groundwater contained within BH1-19, BH2-19, BH3-19, and BH4-21 exceed the MECP Table 7 residential standards.

What Is Known About Areas Where Contaminants Are Present

VOC impacted groundwater was identified across the Phase II – Property with exception to the northwestern corner, in the location of BH5-21.

Distribution and Migration of Contaminants

VOC impacted groundwater was identified across the majority of the Phase II – Property. Based on the results of the Phase II – ESA, the VOC impacts are limited to the groundwater, which is confined within the bedrock layer on the Phase II – Property. It is expected to have migrated onto the subject site from on off-site source located to the southeast.

Discharge of Contaminants

VOC impacts were identified in the groundwater across the majority of the Phase II – Property. Based on the current and historical use of the Phase II – Property, the discharge of contaminants is not anticipated to result from on-site activities.

Migration of Contaminants

VOC impacted groundwater was identified across the majority of the Phase II – Property. Based on the results of the Phase II – ESA, the VOC impacts are limited to the groundwater, which is confined within the bedrock layer on the Phase II – Property. It is expected to have migrated onto the subject site from on off-site source located to the southeast.

Climatic and Meteorological Conditions

In general, climatic, and meteorological conditions have the potential to affect contaminant distribution.

Two ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally. It is our opinion that climatic and meteorological conditions have not influenced contaminant transport in the past.

Potential for Vapour Intrusion

Based on the findings of the Phase II ESA, the potential for vapour intrusion is considered to be low as the VOC impacts were limited to the groundwater, which was intercepted within the bedrock.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for 377 and 381 Winona Avenue, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address five potentially contaminating activities (PCAs) that were identified during the Phase I ESA and were considered to result in areas of potential environmental concern (APECs) on the Phase II - Property. The subsurface investigation consisted of drilling five boreholes, all of which were completed as groundwater monitoring wells.

Soil samples were obtained from the boreholes and screened using visual observations and organic vapour measurements. Six soil samples including one duplicate, were submitted for laboratory analysis of petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene, xylene (BTEX), and/or volatile organic compounds (VOCs). All BTEX, PHC and VOC concentrations identified in the soil samples were in compliance with the applicable MECP Table 7 standards.

Six groundwater samples, including one duplicate sample, were obtained from the monitoring wells installed on the Phase II - Property and were analyzed for PHCs and VOCs. All of the identified PHC parameters were in compliance with the applicable MECP Table 7 standards. Groundwater impacted with VOC parameters cis-1,2-Dichloroethylene, Tetrachloroethylene and Trichloroethylene was identified in the monitoring wells installed in BH2-19, BH3-19, and BH4-21. Tetrachloroethylene impacts were also identified in the groundwater within BH1-19 and vinyl chloride impacts were identified in BH3-19.

Recommendations

Monitoring Wells

It is expected that the groundwater monitoring wells will be abandoned in accordance with O.Reg.903, at the time of construction excavation. It is recommended that the integrity of the monitoring wells be maintained, prior to future construction, for possible further groundwater monitoring purposes.

Risk Assessment

Based on the findings, the VOC impacted groundwater has migrated onto the property from an off-site source.

Furthermore, it is expected that the groundwater quality is indicative of a regional groundwater plume and, as a result, it is not possible to remediate the subject property to generic standards. Given that a record of site condition is not required for the redevelopment of the property, it is recommended that a due diligence risk assessment be completed by a toxicology company to develop mitigative measures that may be warranted prior to the future redevelopment of the Phase II – Property. Paterson will provide the toxicology company with the data contained within the current assessment. This assessment assesses and addresses all potential risks associated with the VOC impacted water, including the potential for vapour intrusion.

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 10731854 Canda Inc. Notification from 10731854 Canda Inc and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Samuel Berube, B.Eng.

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

Report Distribution:

- 10731854 Canda Inc.
- Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE5222-3 – TEST HOLE LOCATION PLAN

DRAWING PE5222-4 ANAYTICAL TESTING PLAN - SOIL (BTEX, PHCs, VOCs)

DRAWING PE5222-4A – CROSS SECTION A-A' SOIL (BTEX, PHCs, VOCs)

DRAWING PE5222-4B – CROSS SECTION B-B' SOIL (BTEX, PHCs, VOCs)

DRAWING PE5222-5 – ANALTICAL TESTING PLAN - GROUNDWATER (BTEX, PHCs, VOCs)

DRAWING PE5222-5A – CROSS SECTION A-A' GROUNDWATER (BTEX, PHCs, VOCs)

DRAWING PE5222-5B – CROSS SECTION B-B' GROUNDWATER (BTEX, PHCs, VOCs)

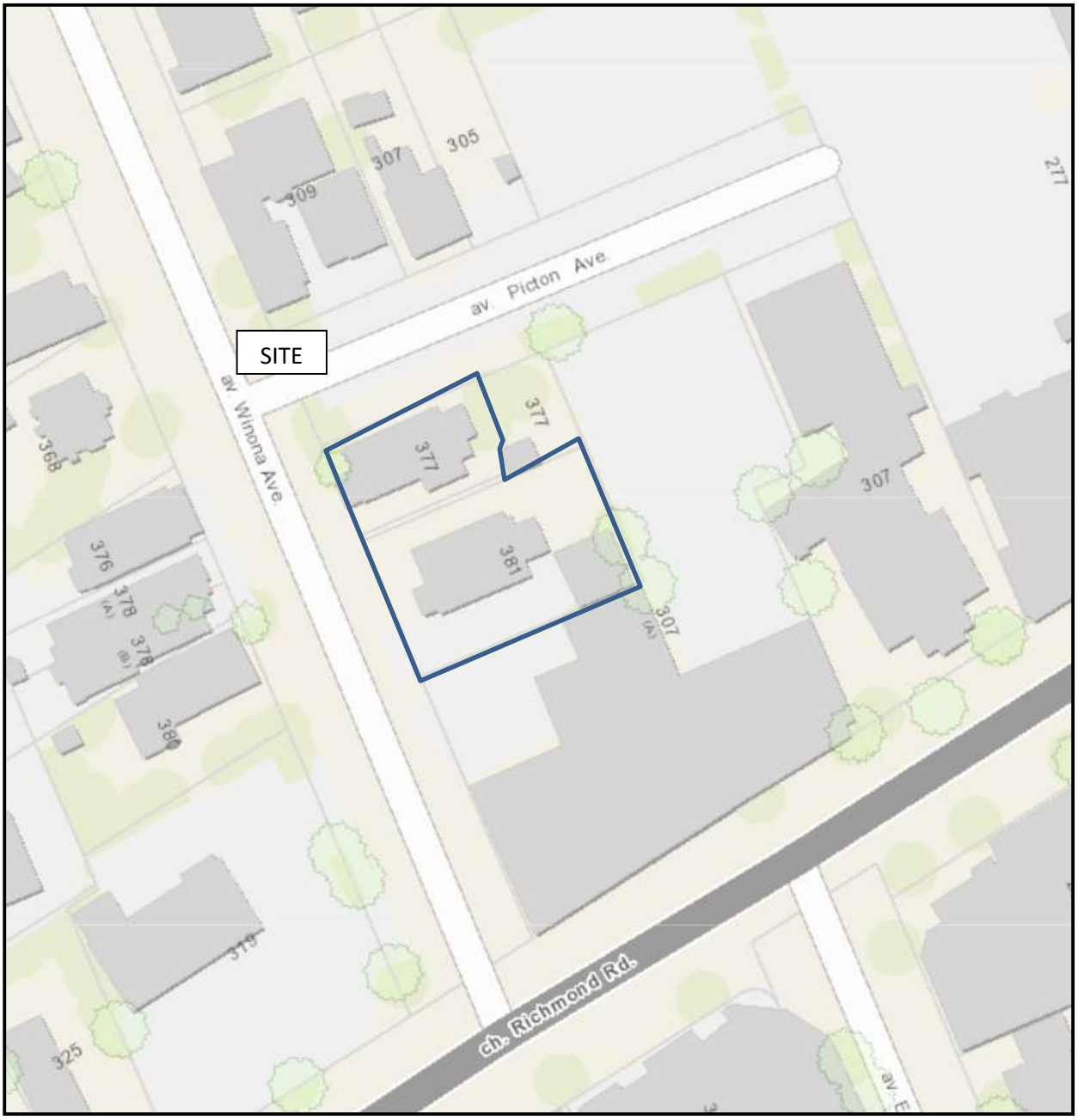
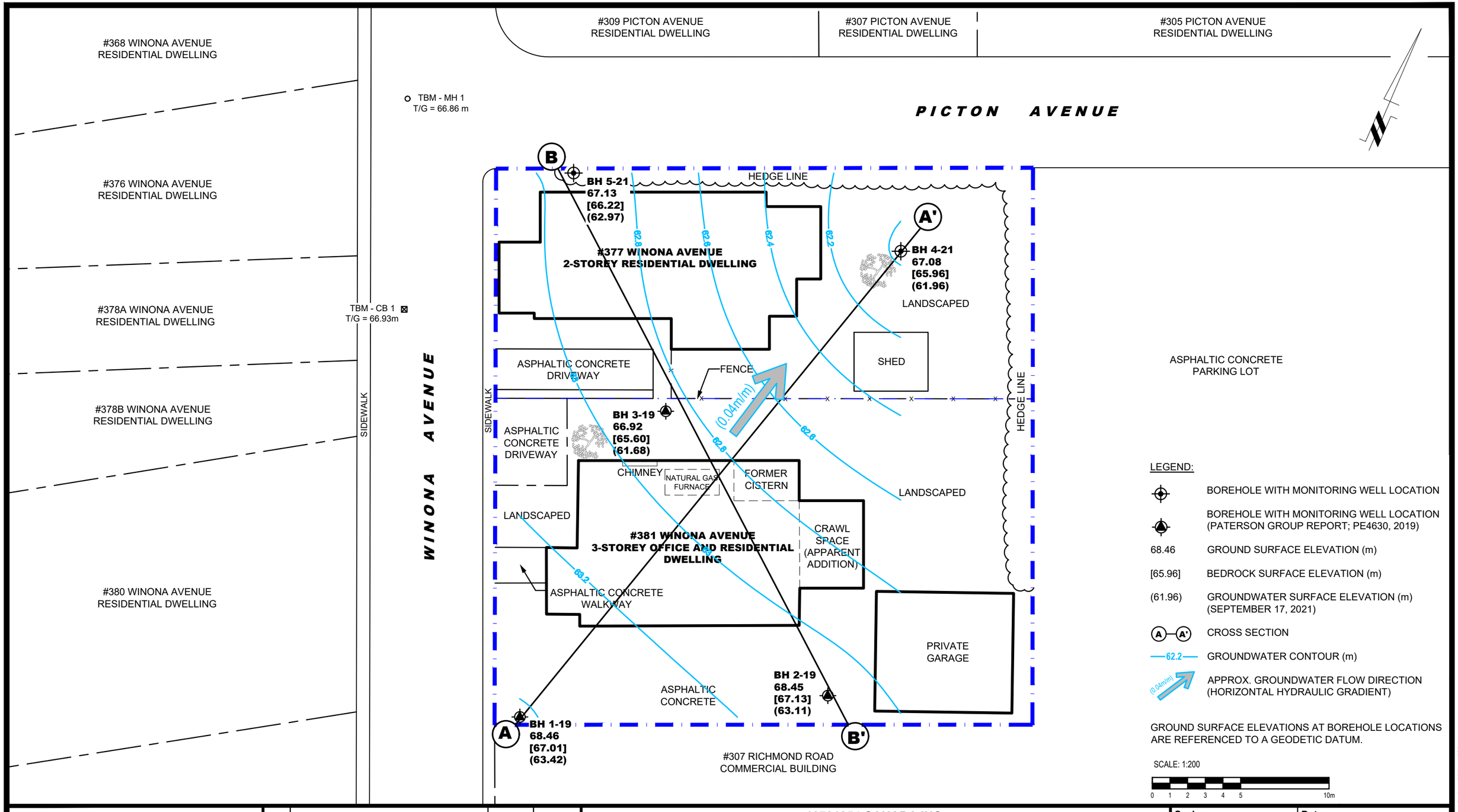


FIGURE 1

KEY PLAN



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NO.	REVISIONS	DATE	INITIAL

10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:200	Date: 10/2021
Drawn by: JM	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-3
Approved by: MSD	Revision No.:

11x17

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#368 WINONA AVENUE
RESIDENTIAL DWELLING

#376 WINONA AVENUE
RESIDENTIAL DWELLING

#378A WINONA AVENUE
RESIDENTIAL DWELLING

#378B WINONA AVENUE
RESIDENTIAL DWELLING

#380 WINONA AVENUE
RESIDENTIAL DWELLING

#309 PICTON AVENUE
RESIDENTIAL DWELLING

#307 PICTON AVENUE
RESIDENTIAL DWELLING

#305 PICTON AVENUE
RESIDENTIAL DWELLING

PICTON AVENUE

WINONA AVENUE

SIDEWALK

TBM - MH 1
T/G = 66.86 m

TBM - CB 1
T/G = 66.93m

BH5-21-SS3 0.36-0.91m 17-Sep-2021
BTEX, PHC(F1-F4) and VOCs comply with MECP Table 7 Standards

BH4-21-SS2 0.46-0.76m 17-Sep-2021
BTEX, PHC(F1-F4) and VOCs comply with MECP Table 7 Standards

BH3-19-SS2 0.75-1.40m 22-Sep-2021
BTEX and PHC(F1-F4) comply with MECP Table 7 Standards

BH2-19-SS2 0.75-1.40m 22-Sep-2021
BTEX and PHC(F1-F4) comply with MECP Table 7 Standards

BH1-19-SS2 0.75-1.40m 22-Sep-2021
BTEX, PHC(F1-F4) and VOCs comply with MECP Table 7 Standards

B

BH 5-21
67.13
[66.22]
(62.97)

HEDGE LINE

#377 WINONA AVENUE
2-STOREY RESIDENTIAL DWELLING

A'

BH 4-21
67.08
[65.96]
(61.96)

LANDSCAPED

ASPHALTIC CONCRETE DRIVEWAY

FENCE

SHED

ASPHALTIC CONCRETE PARKING LOT

BH 3-19
66.92
[65.60]
(61.68)

ASPHALTIC CONCRETE DRIVEWAY

CHIMNEY

NATURAL GAS FURNACE

FORMER CISTERN

LANDSCAPED

LANDSCAPED

#381 WINONA AVENUE
3-STOREY OFFICE AND RESIDENTIAL DWELLING

CRAWL SPACE (APPARENT ADDITION)

ASPHALTIC CONCRETE WALKWAY

PRIVATE GARAGE

ASPHALTIC CONCRETE

BH 2-19
68.45
[67.13]
(63.11)

A

BH 1-19
68.46
[67.01]
(63.42)

B'

#307 RICHMOND ROAD
COMMERCIAL BUILDING

SOIL RESULT COMPLIES WITH MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (PATERSON GROUP REPORT; PE4630, 2019)
- 68.46 GROUND SURFACE ELEVATION (m)
- [65.96] BEDROCK SURFACE ELEVATION (m)
- (61.96) GROUNDWATER SURFACE ELEVATION (m) (SEPTEMBER 17, 2021)
- A—A' CROSS SECTION

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

SCALE: 1:200

0 1 2 3 4 5 10m

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NO.	REVISIONS	DATE	INITIAL

10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE
OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN - SOIL (BTEX, PHCs, VOCs)

Scale: 1:200	Date: 10/2021
Drawn by: YA	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-4
Approved by: MSD	Revision No.:

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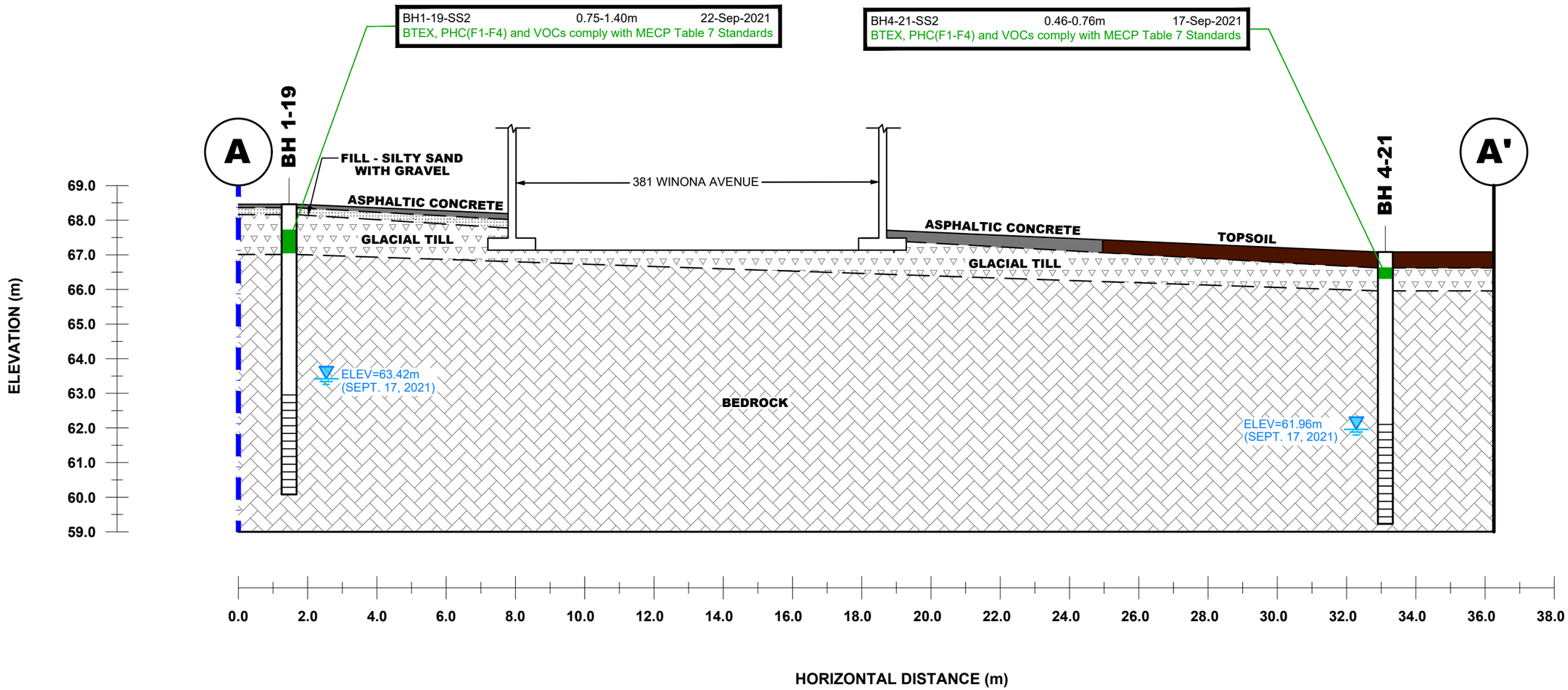

SOIL RESULT COMPLIES WITH MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

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10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (BTEX, PHCs, VOCs)

Scale: AS SHOWN	Date: 10/2021
Drawn by: YA	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-4A
Approved by: MSD	Revision No.:

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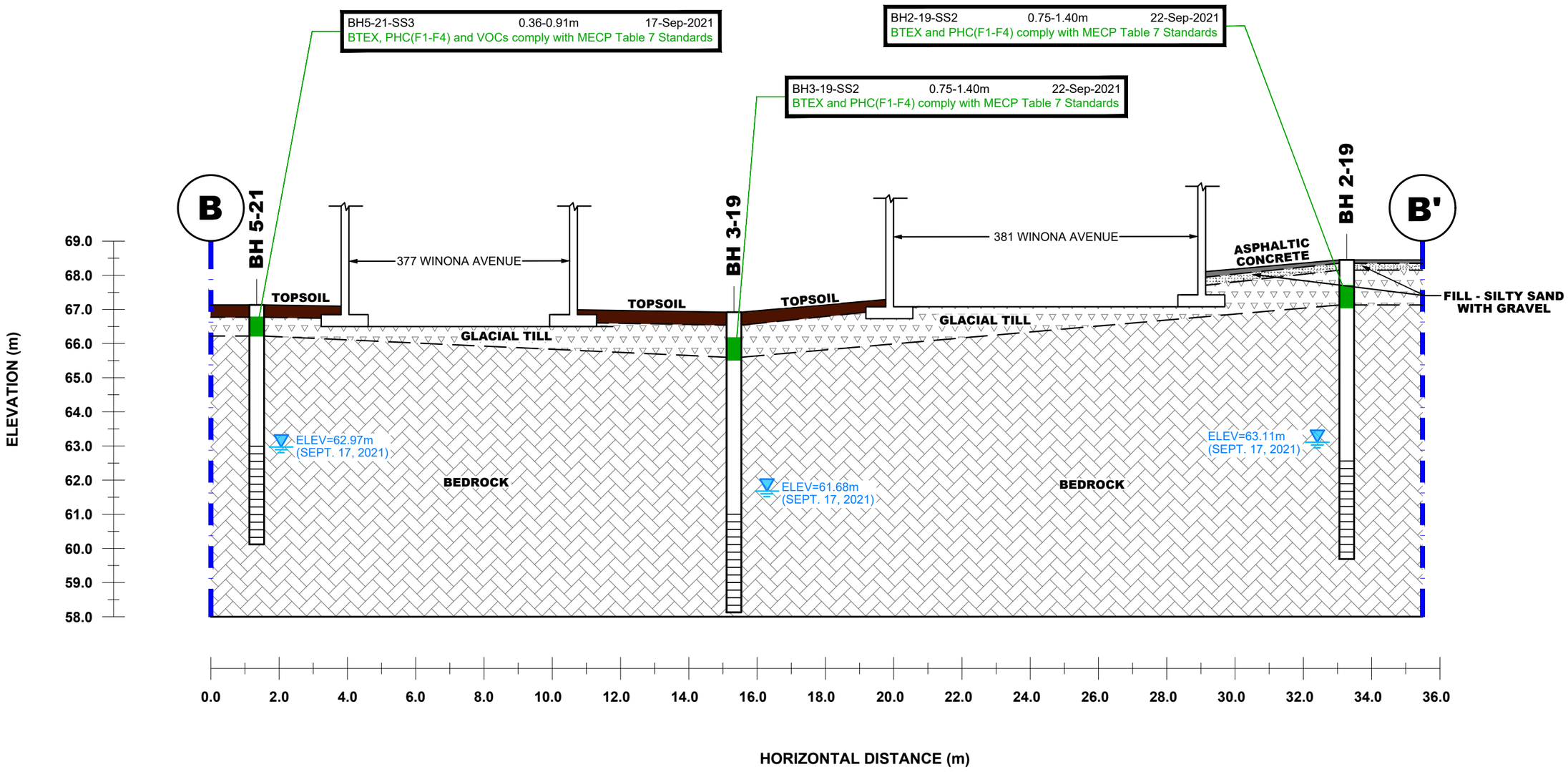

SOIL RESULT COMPLIES WITH MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (BTEX, PHCs, VOCs)

Scale: AS SHOWN	Date: 10/2021
Drawn by: YA	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-4B
Approved by: MSD	Revision No.:

11x17

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#368 WINONA AVENUE
RESIDENTIAL DWELLING

#376 WINONA AVENUE
RESIDENTIAL DWELLING

#378B WINONA AVENUE
RESIDENTIAL DWELLING

#309 PICTON AVENUE
RESIDENTIAL DWELLING

#307 PICTON AVENUE
RESIDENTIAL DWELLING

#305 PICTON AVENUE
RESIDENTIAL DWELLING

PICTON AVENUE

WINONA AVENUE

SIDEWALK

TBM - MH 1
T/G = 66.86 m

BH3-19-GW1	0.76-1.37m	13-June-2019
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	74.3	1.6
Tetrachloroethylene	418	0.5
Trichloroethylene	15	0.5
Vinyl Chloride	0.8	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH3-19-GW2	5.79-8.79m	22-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	94.9	1.6
Tetrachloroethylene	144	0.5
Trichloroethylene	44.1	0.5
Vinyl Chloride	7.1	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH1-19-GW1	0.76-1.37m	11-June-2019
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	13.7	1.6
Tetrachloroethylene	35.8	0.5
Trichloroethylene	6.0	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH1-19-GW2	5.38-8.38m	22-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
Tetrachloroethylene	5.6	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 7 STANDARDS

BH5-21-GW1	4.01-7.01m	17-Sep-2021
BTEX, PHC(F1-F4) and VOCs comply with MECP Table 7 Standards		

BH4-21-GW1	4.85-7.85m	17-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	93	1.6
Tetrachloroethylene	122	0.5
Trichloroethylene	42.1	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

DUP1-GW1	4.85 -7.85m	17-Sep-2021
PHCs (F1-F4) comply with MECP Table 7 Standards		

BH2-19-GW1	0.76-1.37m	11-June-2019
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	63.2	1.6
Tetrachloroethylene	150	0.5
Trichloroethylene	31.3	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH2-19-GW2	5.76-8.76m	22-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	120	1.6
Tetrachloroethylene	155	0.5
Trichloroethylene	55.8	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

B

BH 5-21
67.13
[66.22]
(62.97)

HEDGE LINE

#377 WINONA AVENUE
2-STOREY RESIDENTIAL DWELLING

A'

BH 4-21
67.08
[65.96]
(61.96)

LANDSCAPED

ASPHALTIC CONCRETE DRIVEWAY

FENCE

SHED

HEDGE LINE

BH 3-19
66.92
[65.60]
(61.68)

ASPHALTIC CONCRETE DRIVEWAY

CHIMNEY

NATURAL GAS FURNACE

FORMER CISTERN

LANDSCAPED

LANDSCAPED

#381 WINONA AVENUE
3-STOREY OFFICE AND RESIDENTIAL DWELLING

CRAWL SPACE (APPARENT ADDITION)

ASPHALTIC CONCRETE WALKWAY

PRIVATE GARAGE

ASPHALTIC CONCRETE

BH 2-19
68.45
[67.13]
(63.11)

A

BH 1-19
68.46
[67.01]
(63.42)

B'

#307 RICHMOND ROAD
COMMERCIAL BUILDING

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (PATERSON GROUP REPORT; PE4630, 2019)
- 68.46 GROUND SURFACE ELEVATION (m)
- [65.96] BEDROCK SURFACE ELEVATION (m)
- (61.96) GROUNDWATER SURFACE ELEVATION (m) (SEPTEMBER 17, 2021)
- A—A' CROSS SECTION

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

SCALE: 1:200

0 1 2 3 4 5 10m

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NO.	REVISIONS	DATE	INITIAL

10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - GROUNDWATER (BTEX, PHCs, VOCs)

Scale: 1:200	Date: 10/2021
Drawn by: YA	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-5
Approved by: MSD	Revision No.:

11x17

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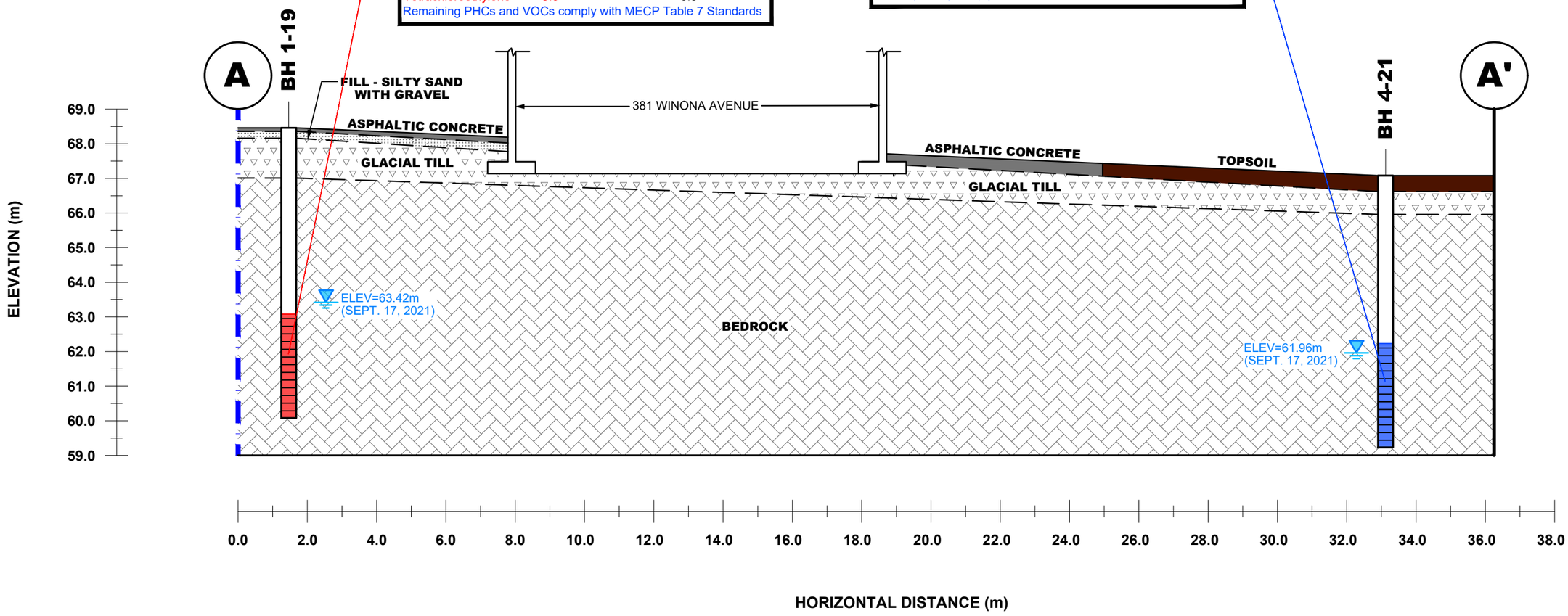
BH1-19-GW1	0.76-1.37m	11-June-2019
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	13.7	1.6
Tetrachloroethylene	35.8	0.5
Trichloroethylene	6.0	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH1-19-GW2	5.38-8.38m	22-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
Tetrachloroethylene	5.6	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH4-21-GW1	4.85-7.85m	17-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	93	1.6
Tetrachloroethylene	122	0.5
Trichloroethylene	42.1	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

DUP1-GW1	4.85 -7.85m	17-Sep-2021
PHCs (F1-F4) comply with MECP Table 7 Standards		



GROUNDWATER RESULT COMPLIES WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 7 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE

OTTAWA, ONTARIO

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

Scale: AS SHOWN	Date: 10/2021
Drawn by: YA	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-5A
Approved by: MSD	Revision No.:

11x17

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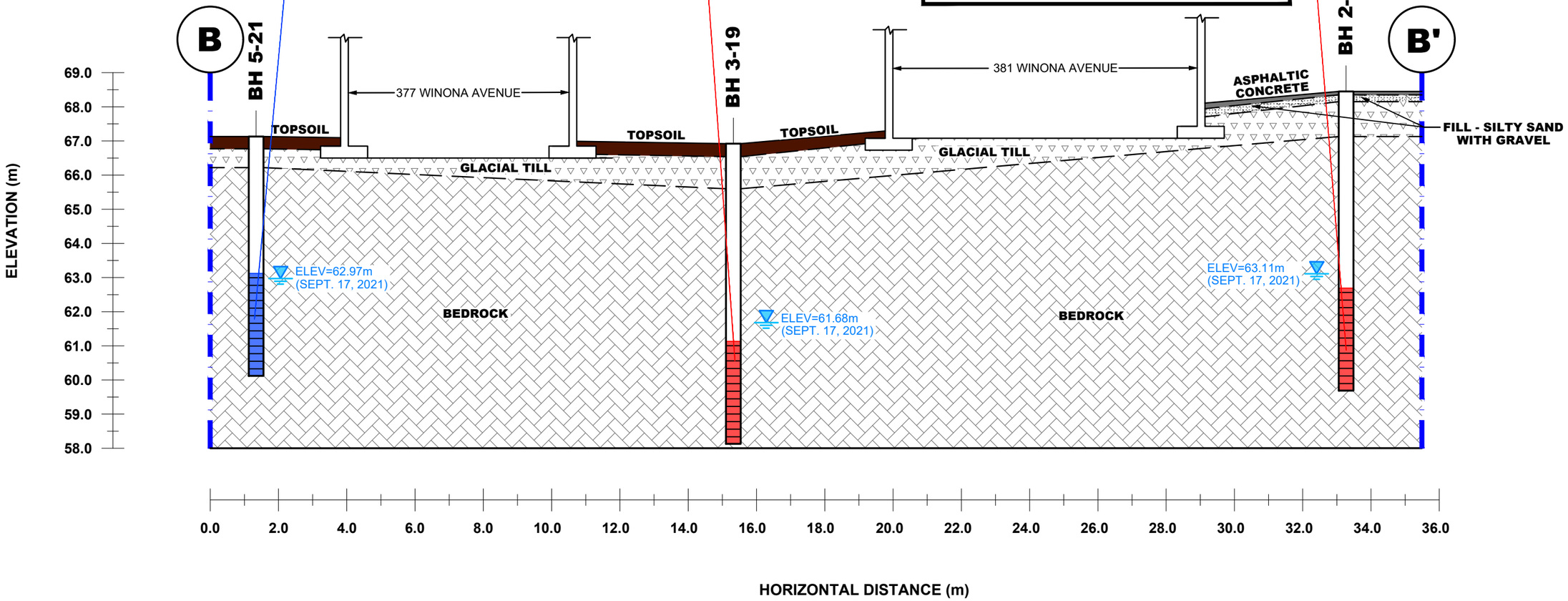
BH3-19-GW2	5.79-8.79m	22-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	94.9	1.6
Tetrachloroethylene	144	0.5
Trichloroethylene	44.1	0.5
Vinyl Chloride	7.1	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH5-21-GW1	4.01-7.01m	17-Sep-2021
BTEX, PHC(F1-F4) and VOCs comply with MECP Table 7 Standards		

BH2-19-GW1	0.76-1.37m	11-June-2019
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	63.2	1.6
Tetrachloroethylene	150	0.5
Trichloroethylene	31.3	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		

BH2-19-GW2	5.76-8.76m	22-Sep-2021
Parameter	Result(µg/g)	Standard(µg/g)
cis-1,2-Dichloroethylene	120	1.6
Tetrachloroethylene	155	0.5
Trichloroethylene	55.8	0.5
Remaining PHCs and VOCs comply with MECP Table 7 Standards		



GROUNDWATER RESULT COMPLIES WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 7 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

10731854 CANADA INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
377 & 381 WINONA AVENUE

OTTAWA, ONTARIO

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

Scale: AS SHOWN	Date: 10/2021
Drawn by: YA	Report No.: PE5222-2
Checked by: SB	Dwg. No.: PE5222-5B
Approved by: MSD	Revision No.:

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APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATE OF ANALYSIS

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

patersongroup

Sampling & Analysis Plan

Phase II Environmental Site Assessment
377 and 381 Winona Avenue
Ottawa, Ontario

Prepared For
10731854 Canada Inc.

September 2021
Report: PE5222-SAP

Paterson Group Inc.

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TABLE OF CONTENTS

1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by 10731854 Canada Inc. to conduct a Phase II Environmental Site Assessment (ESA) of 377 and 381 Winona Avenue, Ottawa, Ontario. Based on our 2021 Phase I ESA completed for the subject property, a subsurface investigation program, consisting of borehole drilling, was developed.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1-19	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner and former BP petroleum products)	Borehole to be advanced to approximately 2m below the expected long-term groundwater table and install a monitoring well.
BH2-19	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner and former BP petroleum products)	Borehole to be advanced to approximately 2m below the expected long-term groundwater table and install a monitoring well.
BH3-19	Assess APECs 1, 2, 3, 4 and 5 (former printer, historical gasoline service station, former automotive service garage, former dry cleaner and former BP petroleum products)	Borehole to be advanced to approximately 2m below the expected long-term groundwater table and install a monitoring well.
BH4-21	Assess APECs 1 and 4 (Former printer and former dry cleaner)	Borehole to be advanced to approximately 2m below the expected long-term groundwater table and install a monitoring well.
BH5-21	Assess APECs 1 and 4 (Former printer and former dry cleaner)	Borehole to be advanced to approximately 2m below the expected long-term groundwater table and install a monitoring 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.

Upon refusal, rock coring shall be undertaken to the required depth. Approximately every metre the well shall be purged by inertial pumping and the water level recorded to determine if groundwater water is entering the borehole.

Following borehole drilling, monitoring wells will be installed in selected boreholes (as above) for the measurement of water levels and the collection of groundwater samples. Borehole locations are shown on the Test Hole Location Plan appended to the main report.

2.0 ANALYTICAL TESTING PROGRAM

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

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

The analytical testing program for 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 the trailer)
- ❒ latex or nitrile gloves (depending on suspected contaminant)
- ❒ RKI Eagle organic vapour meter or MiniRae photoionization detector (depending on contamination suspected)

Determining Borehole Locations

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

After drilling is completed a plan with the borehole locations must be provided. Distances and orientations of boreholes with respect to site features (buildings, roadways, etc.) must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Ground surface elevations at each borehole should be surveyed relative to a catch basin of known geodetic elevation.

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 analysed 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 the 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 an RKI Eagle, PID, etc. depending on the 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 a brush in soapy water, inside and out, including the 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 the 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 the bag.
- ❒ Insert the probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in the 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 the 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 a 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 a 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 the required depth, using drilling and sampling procedures described above.
- ❒ If the borehole is deeper than required monitoring well, backfill with bentonite chips to the 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 the screen. Thread the second section of the screen if required. Thread risers onto the screen. Lower into the borehole to the required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials from entering the 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 the 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 the 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 a socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to the existing ground surface, using water level meter or interface probe. If using an interface probe on suspected NAPL site, measure the thickness of the free product.
- ❒ Measure the total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate the volume of standing water within well and record.
- ❒ Insert polyethylene tubing into well and attach to the peristaltic pump. Turn on the peristaltic pump and purge into the 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 the 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 the 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 a 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 the 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 MOE site remediation standards by a large margin, the decision-making usefulness of the sample may not be considered to be impaired. The proximity of other samples which meet the DQOs must also be considered in developing the Phase II Conceptual Site Model; often there are enough data available to produce a reliable Phase II Conceptual Site Model even if DQOs are not met for certain individual samples.

These considerations are discussed in the body of the report.

6.0 PHYSICAL IMPEDIMENTS TO SAMPLING & ANALYSIS PLAN

Physical impediments to the Sampling and Analysis plan may include:

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

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
377 and 381 Winona Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5222

REMARKS

HOLE NO. BH 1-19

BORINGS BY CME 55 Power Auger **DATE** June 4, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	68.46
Asphaltic concrete 0.08		AU	1				
FILL: Crushed stone, somesand 0.30							
GLACIAL TILL: Dense, brown silty sand with gravel		SS	2	92	37	1	67.46
1.45							
		RC	1	100	59	2	66.46
		RC	2	92	88	3	65.46
BEDROCK: Grey limestone						4	64.46
		RC	3	96	83	5	63.46
		RC	3	93	73	6	62.46
						7	61.46
		RC	5	100	84	8	60.46
8.38							
End of Borehole							
(GWL @ 5.04m - Sept. 17, 2021)							

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
377 and 381 Winona Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5222

REMARKS

HOLE NO. BH 2-19

BORINGS BY CME 55 Power Auger **DATE** June 4, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	68.45
Asphaltic concrete 0.08		AU	1				
FILL: Crushed stone, somesand 0.28							
GLACIAL TILL: Dense, brown silty sand with gravel		SS	2	100	50+	1	67.45
1.32							
		RC	1	100	67	2	66.45
						3	65.45
		RC	2	94	86		
						4	64.45
BEDROCK: Grey limestone							
		RC	3	100	87	5	63.45
						6	62.45
		RC	4	98	77		
						7	61.45
		RC	5	100	79	8	60.45
8.76							
End of Borehole							
(GWL @ 5.34m - Sept. 17, 2021)							

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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SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
377 and 381 Winona Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5222

REMARKS

HOLE NO. BH 3-19

BORINGS BY CME 55 Power Auger **DATE** June 4, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	66.92
TOPSOIL 0.38		AU	1				
GLACIAL TILL: Dense, brown silty sand with gravel 1.32		SS	2	91	38	1	65.92
		RC	1	80	26	2	64.92
		RC	2	100	100	3	63.92
BEDROCK: Grey limestone		RC	3	94	72	4	62.92
		RC	4	100	92	5	61.92
		RC	5	100	82	6	60.92
8.79						7	59.92
End of Borehole						8	58.92
(GWL @ 5.24m - Sept. 17, 2021)							

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
377 and 381 Winona Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5222

REMARKS

HOLE NO. BH 4-21

BORINGS BY Portable Drill **DATE** September 10, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	67.08
TOPSOIL 0.46		SS	1	25	26		
GLACIAL TILL: Brown silty sand with gravel, cobbles and boulders 1.12		SS	2	20	50+	1	66.08
		RC	1	100	65	2	65.08
		RC	2	100	88	3	64.08
BEDROCK: Fair to excellent quality, grey silty dolostone interbedded with limestone and shale		RC	3	100	85	4	63.08
		RC	4	100	100	5	62.08
		RC	5	100	86	6	61.08
7.85						7	60.08
End of Borehole							
(GWL @ 5.12m - Sept. 17, 2021)							

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
377 and 381 Winona Avenue
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5222

REMARKS

HOLE NO. BH 5-21

BORINGS BY Portable Drill **DATE** September 13, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	67.13
TOPSOIL 0.36		SS	1	4	8		
GLACIAL TILL: Brown silty sand with gravel, cobbles and boulders 0.91		SS	2	83	50+	1	66.13
		RC	1	93	53	2	65.13
		RC	2	97	97	3	64.13
BEDROCK: Fair to excellent quality, grey silty dolostone interbedded with limestone and shale		RC	3	100	77	4	63.13
		RC	4	100	95	5	62.13
						6	61.13
7.01						7	60.13
End of Borehole							
(GWL @ 4.16m - Sept. 17, 2021)							

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

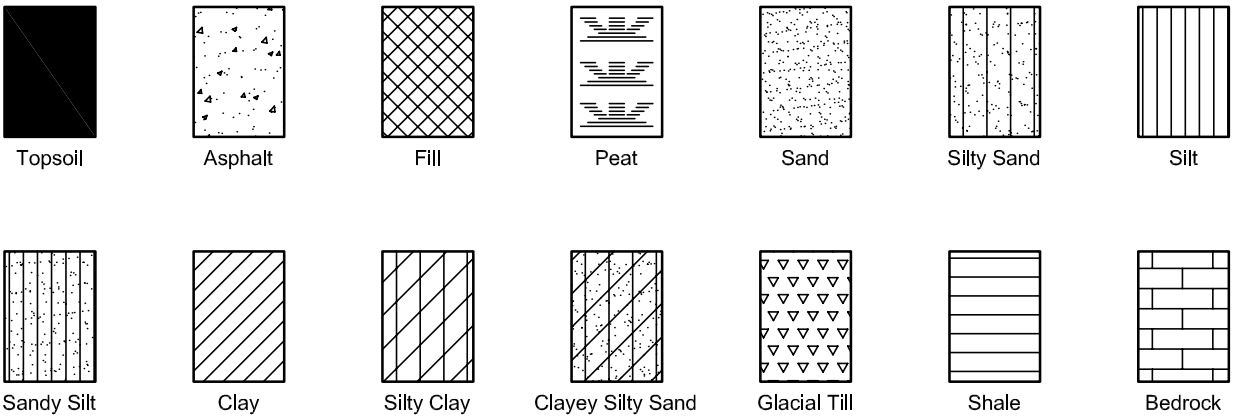
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

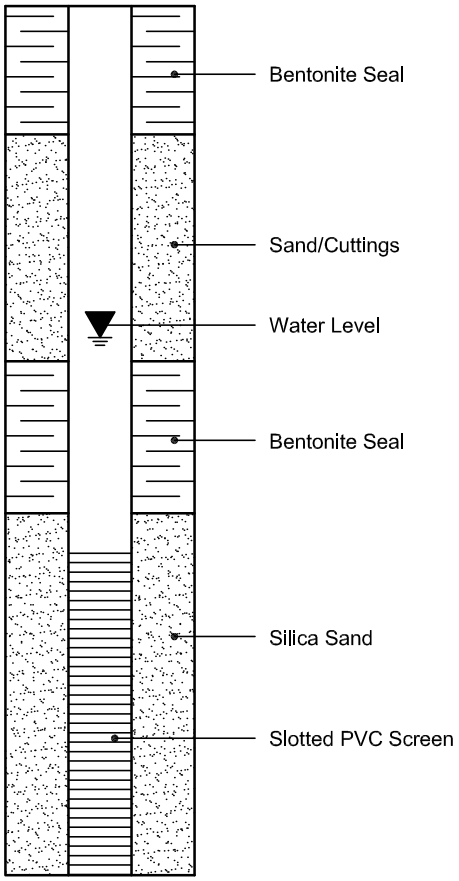
SYMBOLS AND TERMS (continued)

STRATA PLOT

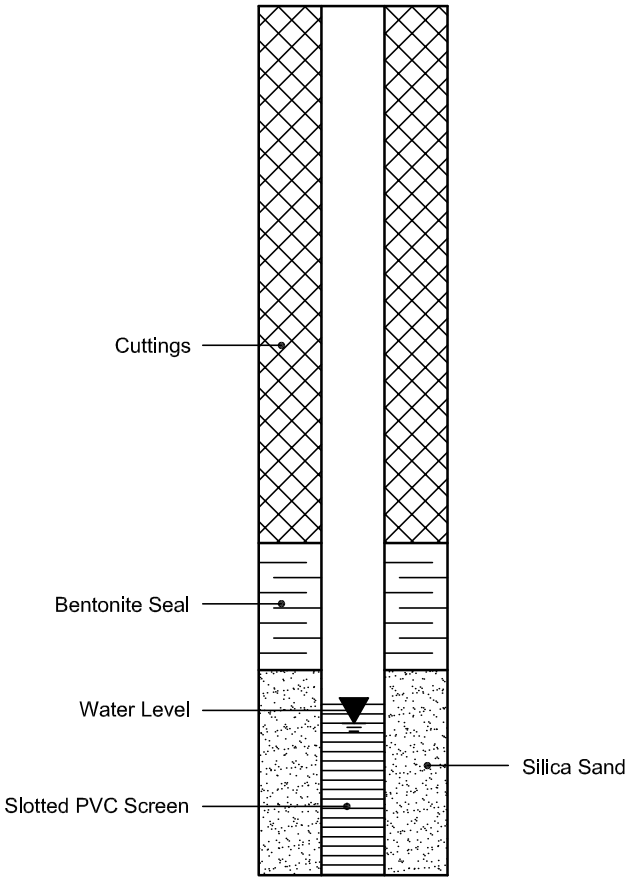


MONITORING WELL AND PIEZOMETER CONSTRUCTION

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: Eric Leveque

Client PO: 22911
Project: PE4630
Custody: 122361

Report Date: 10-Jun-2019
Order Date: 5-Jun-2019

Order #: 1923388

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

Paracel ID	Client ID
1923388-01	BH1-SS2
1923388-02	BH2-SS2
1923388-03	BH3-SS2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 22911

Report Date: 10-Jun-2019
Order Date: 5-Jun-2019
Project Description: PE4630

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	7-Jun-19	8-Jun-19
PHC F1	CWS Tier 1 - P&T GC-FID	7-Jun-19	8-Jun-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	6-Jun-19	6-Jun-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	7-Jun-19	8-Jun-19
Solids, %	Gravimetric, calculation	7-Jun-19	7-Jun-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 22911

Report Date: 10-Jun-2019

Order Date: 5-Jun-2019

Project Description: PE4630

	Client ID:	BH1-SS2	BH2-SS2	BH3-SS2	-
	Sample Date:	04-Jun-19 09:00	04-Jun-19 09:00	04-Jun-19 09:00	-
	Sample ID:	1923388-01	1923388-02	1923388-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	89.4	94.2	91.3	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 22911

Report Date: 10-Jun-2019

Order Date: 5-Jun-2019

Project Description: PE4630

	Client ID:	BH1-SS2	BH2-SS2	BH3-SS2	-
	Sample Date:	04-Jun-19 09:00	04-Jun-19 09:00	04-Jun-19 09:00	-
	Sample ID:	1923388-01	1923388-02	1923388-03	-
	MDL/Units	Soil	Soil	Soil	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	92.0%	-	-	-
Dibromofluoromethane	Surrogate	105%	-	-	-
Toluene-d8	Surrogate	70.9%	-	-	-
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	<0.05	-
o-Xylene	0.05 ug/g dry	-	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene-d8	Surrogate	-	75.1%	60.4%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	39	47	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	97	133	<6	-

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									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*4.24*		*ug/g*		*132*	*50-140*			
Surrogate: Dibromofluoromethane	*2.98*		*ug/g*		*93.2*	*50-140*			
Surrogate: Toluene-d8	*2.83*		*ug/g*		*88.5*	*50-140*			
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*2.83*		*ug/g*		*88.5*	*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				40	
F2 PHCs (C10-C16)	24	4	ug/g dry	27			9.5	30	
F3 PHCs (C16-C34)	281	8	ug/g dry	311			10.2	30	
F4 PHCs (C34-C50)	142	6	ug/g dry	134			6.1	30	
Physical Characteristics									
% Solids	78.4	0.1	% by Wt.	72.6			7.7	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	*5.17*		*ug/g dry*		*136*	*50-140*			
Surrogate: Dibromofluoromethane	*5.13*		*ug/g dry*		*134*	*50-140*			
Surrogate: Toluene-d8	*2.96*		*ug/g dry*		*77.5*	*50-140*			
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: Toluene-d8	*2.96*		*ug/g dry*		*77.5*	*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)	190	7	ug/g		94.9	80-120			
F2 PHCs (C10-C16)	122	4	ug/g	27	98.7	60-140			
F3 PHCs (C16-C34)	543	8	ug/g	311	98.0	60-140			
F4 PHCs (C34-C50)	418	6	ug/g	134	190	60-140			QR-06
Volatiles									
Acetone	10.8	0.50	ug/g		108	50-140			
Benzene	4.24	0.02	ug/g		106	60-130			
Bromodichloromethane	4.33	0.05	ug/g		108	60-130			
Bromoform	5.00	0.05	ug/g		125	60-130			
Bromomethane	3.49	0.05	ug/g		87.3	50-140			
Carbon Tetrachloride	3.80	0.05	ug/g		94.9	60-130			
Chlorobenzene	3.62	0.05	ug/g		90.6	60-130			
Chloroform	3.74	0.05	ug/g		93.6	60-130			
Dibromochloromethane	4.90	0.05	ug/g		123	60-130			
Dichlorodifluoromethane	3.19	0.05	ug/g		79.9	50-140			
1,2-Dichlorobenzene	3.98	0.05	ug/g		99.4	60-130			
1,3-Dichlorobenzene	3.86	0.05	ug/g		96.5	60-130			
1,4-Dichlorobenzene	3.13	0.05	ug/g		78.2	60-130			
1,1-Dichloroethane	4.34	0.05	ug/g		108	60-130			
1,2-Dichloroethane	3.75	0.05	ug/g		93.7	60-130			
1,1-Dichloroethylene	4.54	0.05	ug/g		113	60-130			
cis-1,2-Dichloroethylene	4.11	0.05	ug/g		103	60-130			
trans-1,2-Dichloroethylene	3.73	0.05	ug/g		93.2	60-130			
1,2-Dichloropropane	4.63	0.05	ug/g		116	60-130			
cis-1,3-Dichloropropylene	3.65	0.05	ug/g		91.3	60-130			
trans-1,3-Dichloropropylene	4.34	0.05	ug/g		108	60-130			
Ethylbenzene	3.53	0.05	ug/g		88.3	60-130			
Ethylene dibromide (dibromoethane	4.70	0.05	ug/g		118	60-130			
Hexane	4.68	0.05	ug/g		117	60-130			
Methyl Ethyl Ketone (2-Butanone)	12.6	0.50	ug/g		126	50-140			
Methyl Isobutyl Ketone	10.6	0.50	ug/g		106	50-140			
Methyl tert-butyl ether	9.18	0.05	ug/g		91.8	50-140			
Methylene Chloride	4.37	0.05	ug/g		109	60-130			
Styrene	4.10	0.05	ug/g		102	60-130			
1,1,1,2-Tetrachloroethane	4.47	0.05	ug/g		112	60-130			
1,1,2,2-Tetrachloroethane	4.96	0.05	ug/g		124	60-130			
Tetrachloroethylene	4.01	0.05	ug/g		100	60-130			
Toluene	4.20	0.05	ug/g		105	60-130			
1,1,1-Trichloroethane	3.81	0.05	ug/g		95.1	60-130			
1,1,2-Trichloroethane	4.86	0.05	ug/g		122	60-130			
Trichloroethylene	2.88	0.05	ug/g		71.9	60-130			
Trichlorofluoromethane	2.90	0.05	ug/g		72.6	50-140			
Vinyl chloride	3.72	0.02	ug/g		92.9	50-140			
m,p-Xylenes	10.3	0.05	ug/g		129	60-130			
o-Xylene	4.42	0.05	ug/g		110	60-130			
Surrogate: 4-Bromofluorobenzene	*3.00*		*ug/g*		*93.8*	*50-140*			
Benzene	4.24	0.02	ug/g		106	60-130			
Ethylbenzene	3.53	0.05	ug/g		88.3	60-130			
Toluene	4.20	0.05	ug/g		105	60-130			
m,p-Xylenes	10.3	0.05	ug/g		129	60-130			
o-Xylene	4.42	0.05	ug/g		110	60-130			

Qualifier Notes:

QC Qualifiers :

QR-06 : Sample result outside of calibration range, duplicate results not accepted.

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.

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 WO: 1923388

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Chain of Custody (Lab Use Only)
№ 122361

Page __ of __

Client Name: Paterson
Contact Name: Eric Leveque
Address: 154 Colonnade Rd Ottawa
Telephone: 613-226-7381
Project Reference: PE4630
Quote #:
PO #: 22911
Email Address: eleveque@patersongroup.ca

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

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 3 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ____ ☐ Other: ____

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

Paracel Order Number: 1923388

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH1-SS2	S		2	June 4		X	X								120ml+1x40ml			
2	BH2-SS2	S		2	June 4		X									↓			
3	BH3-SS2	S		2	June 4		X												
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: Swift

Relinquished By (Sign): Anna Graham	Received by Driver/Depot:	Received at Lab: Sumeeporn Dokmai	Verified By:
Relinquished By (Print): Anna Graham	Date/Time:	Date/Time: JUN 05, 2019 04.1	Date/Time: 06-05-19 17:07
Date/Time: June 5 2019	Temperature: °C	Temperature: 9.8 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Anna Graham

Client PO: 26896
Project: PE4630
Custody: 122389

Report Date: 17-Jun-2019
Order Date: 11-Jun-2019

Order #: 1924256

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

Paracel ID	Client ID
1924256-01	BH1-GW1
1924256-02	BH2-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	17-Jun-19	17-Jun-19
PHC F1	CWS Tier 1 - P&T GC-FID	14-Jun-19	17-Jun-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	12-Jun-19	14-Jun-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	14-Jun-19	17-Jun-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26896

Report Date: 17-Jun-2019

Order Date: 11-Jun-2019

Project Description: PE4630

	Client ID:	BH1-GW1	BH2-GW1	-	-
	Sample Date:	11-Jun-19 13:00	11-Jun-19 13:15	-	-
	Sample ID:	1924256-01	1924256-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	13.7	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	35.8	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26896

Report Date: 17-Jun-2019

Order Date: 11-Jun-2019

Project Description: PE4630

	Client ID:	BH1-GW1	BH2-GW1	-	-
	Sample Date:	11-Jun-19 13:00	11-Jun-19 13:15	-	-
	Sample ID:	1924256-01	1924256-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	6.0	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	111%	-	-	-
Dibromofluoromethane	Surrogate	97.6%	-	-	-
Toluene-d8	Surrogate	98.7%	-	-	-
Benzene	0.5 ug/L	-	<0.5	-	-
Ethylbenzene	0.5 ug/L	-	<0.5	-	-
Toluene	0.5 ug/L	-	<0.5	-	-
m,p-Xylenes	0.5 ug/L	-	<0.5	-	-
o-Xylene	0.5 ug/L	-	<0.5	-	-
Xylenes, total	0.5 ug/L	-	<0.5	-	-
Toluene-d8	Surrogate	-	99.6%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<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	-	-

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	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	*87.8*		*ug/L*		*110*	*50-140*			
Surrogate: Dibromofluoromethane	*73.3*		*ug/L*		*91.6*	*50-140*			
Surrogate: Toluene-d8	*84.1*		*ug/L*		*105*	*50-140*			
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	*84.1*		*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)	479	25	ug/L	391			20.2	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	12.2	0.5	ug/L	12.5			1.9	30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	50.9	0.5	ug/L	50.2			1.4	30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	174	2.0	ug/L	183			4.7	30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	190	0.5	ug/L	192			1.3	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	360	0.5	ug/L	374			3.7	30	
o-Xylene	225	0.5	ug/L	228			1.3	30	
Surrogate: 4-Bromofluorobenzene	*78.0*		*ug/L*		*97.5*	*50-140*			
Surrogate: Dibromofluoromethane	*59.7*		*ug/L*		*74.7*	*50-140*			
Surrogate: Toluene-d8	*84.3*		*ug/L*		*105*	*50-140*			
Benzene	12.2	0.5	ug/L	12.5			1.9	30	
Ethylbenzene	50.9	0.5	ug/L	50.2			1.4	30	
Toluene	190	0.5	ug/L	192			1.3	30	
m,p-Xylenes	360	0.5	ug/L	374			3.7	30	
o-Xylene	225	0.5	ug/L	228			1.3	30	
Surrogate: Toluene-d8	*84.3*		*ug/L*		*105*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1880	25	ug/L		93.8	68-117			
F2 PHCs (C10-C16)	1600	100	ug/L		100	60-140			
F3 PHCs (C16-C34)	4150	100	ug/L		106	60-140			
F4 PHCs (C34-C50)	2550	100	ug/L		103	60-140			
Volatiles									
Acetone	118	5.0	ug/L		118	50-140			
Benzene	24.0	0.5	ug/L		60.1	60-130			
Bromodichloromethane	24.0	0.5	ug/L		60.0	60-130			
Bromoform	31.1	0.5	ug/L		77.7	60-130			
Bromomethane	22.8	0.5	ug/L		57.0	50-140			
Carbon Tetrachloride	25.2	0.2	ug/L		63.0	60-130			
Chlorobenzene	30.3	0.5	ug/L		75.6	60-130			
Chloroform	39.0	0.5	ug/L		97.4	60-130			
Dibromochloromethane	29.3	0.5	ug/L		73.4	60-130			
Dichlorodifluoromethane	22.0	1.0	ug/L		54.9	50-140			
1,2-Dichlorobenzene	36.6	0.5	ug/L		91.5	60-130			
1,3-Dichlorobenzene	35.9	0.5	ug/L		89.6	60-130			
1,4-Dichlorobenzene	34.9	0.5	ug/L		87.2	60-130			
1,1-Dichloroethane	28.4	0.5	ug/L		71.1	60-130			
1,2-Dichloroethane	24.0	0.5	ug/L		60.0	60-130			
1,1-Dichloroethylene	25.2	0.5	ug/L		63.0	60-130			
cis-1,2-Dichloroethylene	24.1	0.5	ug/L		60.2	60-130			
trans-1,2-Dichloroethylene	24.0	0.5	ug/L		60.0	60-130			
1,2-Dichloropropane	24.0	0.5	ug/L		60.0	60-130			
cis-1,3-Dichloropropylene	30.3	0.5	ug/L		75.7	60-130			
trans-1,3-Dichloropropylene	24.0	0.5	ug/L		60.0	60-130			
Ethylbenzene	30.0	0.5	ug/L		75.0	60-130			
Ethylene dibromide (dibromoethane	29.7	0.2	ug/L		74.4	60-130			
Hexane	44.9	1.0	ug/L		112	60-130			
Methyl Ethyl Ketone (2-Butanone)	99.4	5.0	ug/L		99.4	50-140			
Methyl Isobutyl Ketone	69.4	5.0	ug/L		69.4	50-140			
Methyl tert-butyl ether	60.4	2.0	ug/L		60.4	50-140			
Methylene Chloride	25.6	5.0	ug/L		64.1	60-130			
Styrene	29.3	0.5	ug/L		73.3	60-130			
1,1,1,2-Tetrachloroethane	39.3	0.5	ug/L		98.2	60-130			
1,1,2,2-Tetrachloroethane	29.2	0.5	ug/L		73.1	60-130			
Tetrachloroethylene	29.8	0.5	ug/L		74.6	60-130			
Toluene	29.4	0.5	ug/L		73.5	60-130			
1,1,1-Trichloroethane	24.0	0.5	ug/L		60.0	60-130			
1,1,2-Trichloroethane	24.0	0.5	ug/L		60.0	60-130			
Trichloroethylene	36.4	0.5	ug/L		91.0	60-130			
Trichlorofluoromethane	24.0	1.0	ug/L		60.0	60-130			
Vinyl chloride	36.3	0.5	ug/L		90.7	50-140			
m,p-Xylenes	64.5	0.5	ug/L		80.6	60-130			
o-Xylene	33.7	0.5	ug/L		84.2	60-130			
Surrogate: 4-Bromofluorobenzene	*69.3*		*ug/L*		*86.6*	*50-140*			
Benzene	24.0	0.5	ug/L		60.1	60-130			
Ethylbenzene	30.0	0.5	ug/L		75.0	60-130			
Toluene	29.4	0.5	ug/L		73.5	60-130			
m,p-Xylenes	64.5	0.5	ug/L		80.6	60-130			
o-Xylene	33.7	0.5	ug/L		84.2	60-130			

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.

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.

TR RE RE

PARACEL WO: 1924256

Head Office
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Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com

Chain of Custody
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№ 122389

Page ___ of ___

Client Name: Paterson Group	Project Reference: PE4630
Contact Name: Anna Graham	Quote #
Address: 154 Colonnade Rd. S.	PO # 26896
Telephone: 613-226-7381	Email Address: agraham@patersongroup.ca

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: ___

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ___ ☐ Other: ___

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

Required Analyses

Paracel Order Number: 1924256

	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-GW1	GW		5	June 11/19	1:00 pm	X	X												
2	BH2-GW1	↓		3	↓	1:15 pm	X													
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): N. Sullivan	Received by Driver/Depot: A. LOUISE	Received at Lab: Sureeporn Bhmai	Verified By:
Relinquished By (Print): Nick Sullivan	Date/Time: 11/06/19 3:20 PM	Date/Time: JUN 11, 2019 04:30	Date/Time: 06-11-19 17:30
Date/Time: June 11/2019	Temperature:	Temperature: 11.8 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Anna Graham

Client PO: 26934
Project: PE4630
Custody: 122393

Report Date: 18-Jun-2019
Order Date: 13-Jun-2019

Order #: 1924559

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

Paracel ID	Client ID
1924559-01	BH3-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26934

Report Date: 18-Jun-2019
Order Date: 13-Jun-2019
Project Description: PE4630

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	16-Jun-19	16-Jun-19
PHC F1	CWS Tier 1 - P&T GC-FID	14-Jun-19	16-Jun-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	14-Jun-19	15-Jun-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26934

Report Date: 18-Jun-2019

Order Date: 13-Jun-2019

Project Description: PE4630

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	13-Jun-19 09:45	-	-	-
	Sample ID:	1924559-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
Toluene-d8	Surrogate	88.2%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	80 [1]	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

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	*31.0*		*ug/L*		*96.9*	*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				30	
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND			0.0	30	
Toluene	ND	0.5	ug/L	ND			0.0	30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND			0.0	30	
Surrogate: Toluene-d8	*39.0*		*ug/L*		*122*	*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)	2040	25	ug/L		102	68-117			
F2 PHCs (C10-C16)	1790	100	ug/L		112	60-140			
F3 PHCs (C16-C34)	4270	100	ug/L		109	60-140			
F4 PHCs (C34-C50)	2820	100	ug/L		114	60-140			
Volatiles									
Benzene	26.4	0.5	ug/L		66.0	60-130			
Ethylbenzene	30.0	0.5	ug/L		75.0	60-130			
Toluene	41.7	0.5	ug/L		104	60-130			
m,p-Xylenes	83.4	0.5	ug/L		104	60-130			
o-Xylene	35.8	0.5	ug/L		89.6	60-130			
Surrogate: Toluene-d8	*26.5*		*ug/L*		*82.9*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Peaks quantified in the TPH(gas)/PHC(F1) range do not have a fingerprint pattern typical of petroleum hydrocarbons - may be solvents or other volatile compounds.

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.

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 ID: 1924559

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№ 122393

Page __ of __

Client Name: Paterson Group
Contact Name: Anna Graham
Address: 154 Colonnade Rd. S.
Telephone: 613-226-7381

Project Reference: PE4630
Quote #
PO # 26934
Email Address: agraham@patersongroup.ca

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Required Analyses

Paracel Order Number: 1924559

	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	BH3-GW1	GW		3	Jun 13/19	9:45am	X						
2													
3													
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): N. Sullivan
Relinquished By (Print): Nick Sullivan
Date/Time: June 13, 2019

Received by Driver/Depot: A. Flouse
Date/Time: 13/06/19 3:40 PM
Temperature: °C

Received at Lab: Suneepoorn Pokmai
Date/Time: JUN 13, 2019 04:25
Temperature: 12.6 °C

Verified By:
Date/Time: June 13 19 5:32
pH Verified [ ] By: _____

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Sam Berube

Client PO: 33139
Project: PE5222
Custody: 133103

Report Date: 17-Sep-2021
Order Date: 14-Sep-2021

Order #: 2138242

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

Paracel ID	Client ID
2138242-01	BH1-21-SS2
2138242-02	DUP-1
2138242-03	BH2-21-SS3

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 17-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 14-Sep-2021

Client PO: 33139

Project Description: PE5222

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	16-Sep-21	16-Sep-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	14-Sep-21	17-Sep-21
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	16-Sep-21	16-Sep-21
Solids, %	Gravimetric, calculation	15-Sep-21	15-Sep-21

Certificate of Analysis

Report Date: 17-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 14-Sep-2021

Client PO: 33139

Project Description: PE5222

	Client ID:	BH1-21-SS2	DUP-1	BH2-21-SS3	-
	Sample Date:	10-Sep-21 09:00	10-Sep-21 09:00	13-Sep-21 09:00	-
	Sample ID:	2138242-01	2138242-02	2138242-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	95.5	95.1	92.7	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Ethylene dibromide (dibromoethane, 1,2-)	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-

Certificate of Analysis

Report Date: 17-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 14-Sep-2021

Client PO: 33139

Project Description: PE5222

	Client ID:	BH1-21-SS2	DUP-1	BH2-21-SS3	-
	Sample Date:	10-Sep-21 09:00	10-Sep-21 09:00	13-Sep-21 09:00	-
	Sample ID:	2138242-01	2138242-02	2138242-03	-
	MDL/Units	Soil	Soil	Soil	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
4-Bromofluorobenzene	Surrogate	75.1%	77.4%	82.4%	-
Dibromofluoromethane	Surrogate	64.5%	64.2%	63.6%	-
Toluene-d8	Surrogate	99.9%	97.7%	103%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	<6	-

Certificate of Analysis

Report Date: 17-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 14-Sep-2021

Client PO: 33139

Project Description: PE5222

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									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane, 1,2	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*2.47*		*ug/g*		*77.1*	*50-140*			
Surrogate: Dibromofluoromethane	*3.48*		*ug/g*		*109*	*50-140*			
Surrogate: Toluene-d8	*3.42*		*ug/g*		*107*	*50-140*			

Certificate of Analysis

Report Date: 17-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 14-Sep-2021

Client PO: 33139

Project Description: PE5222

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)	22	8	ug/g dry	11			NC	30	
F4 PHCs (C34-C50)	39	6	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	96.4	0.1	% by Wt.	97.7			1.3	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND			NC	50	
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g dry	ND			NC	50	
Bromoform	ND	0.05	ug/g dry	ND			NC	50	
Bromomethane	ND	0.05	ug/g dry	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
Chloroform	ND	0.05	ug/g dry	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g dry	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2	ND	0.05	ug/g dry	ND			NC	50	
Hexane	ND	0.05	ug/g dry	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g dry	ND			NC	50	
Styrene	ND	0.05	ug/g dry	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND			NC	50	
Vinyl chloride	ND	0.02	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: 4-Bromofluorobenzene	*2.60*		*ug/g dry*		*77.6*	*50-140*			
Surrogate: Dibromofluoromethane	*3.15*		*ug/g dry*		*94.1*	*50-140*			
Surrogate: Toluene-d8	*3.54*		*ug/g dry*		*106*	*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)	226	7	ug/g	ND	113	80-120			
F2 PHCs (C10-C16)	99	4	ug/g	ND	110	60-140			
F3 PHCs (C16-C34)	273	8	ug/g	11	119	60-140			
F4 PHCs (C34-C50)	174	6	ug/g	ND	124	60-140			
Volatiles									
Acetone	12.5	0.50	ug/g	ND	125	50-140			
Benzene	2.92	0.02	ug/g	ND	73.0	60-130			
Bromodichloromethane	2.66	0.05	ug/g	ND	66.4	60-130			
Bromoform	4.21	0.05	ug/g	ND	105	60-130			
Bromomethane	3.43	0.05	ug/g	ND	85.8	50-140			
Carbon Tetrachloride	2.89	0.05	ug/g	ND	72.3	60-130			
Chlorobenzene	3.65	0.05	ug/g	ND	91.4	60-130			
Chloroform	2.66	0.05	ug/g	ND	66.4	60-130			
Dibromochloromethane	3.69	0.05	ug/g	ND	92.4	60-130			
Dichlorodifluoromethane	4.80	0.05	ug/g	ND	120	50-140			
1,2-Dichlorobenzene	3.71	0.05	ug/g	ND	92.7	60-130			
1,3-Dichlorobenzene	3.54	0.05	ug/g	ND	88.6	60-130			
1,4-Dichlorobenzene	3.60	0.05	ug/g	ND	90.1	60-130			
1,1-Dichloroethane	2.92	0.05	ug/g	ND	73.1	60-130			
1,2-Dichloroethane	2.76	0.05	ug/g	ND	69.1	60-130			
1,1-Dichloroethylene	2.72	0.05	ug/g	ND	67.9	60-130			
cis-1,2-Dichloroethylene	2.65	0.05	ug/g	ND	66.3	60-130			
trans-1,2-Dichloroethylene	3.13	0.05	ug/g	ND	78.2	60-130			
1,2-Dichloropropane	4.00	0.05	ug/g	ND	99.9	60-130			
cis-1,3-Dichloropropylene	3.01	0.05	ug/g	ND	75.3	60-130			
trans-1,3-Dichloropropylene	3.12	0.05	ug/g	ND	78.0	60-130			
Ethylbenzene	3.38	0.05	ug/g	ND	84.5	60-130			
Ethylene dibromide (dibromoethane, 1,2-	3.84	0.05	ug/g	ND	96.0	60-130			
Hexane	3.80	0.05	ug/g	ND	94.9	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.99	0.50	ug/g	ND	89.9	50-140			
Methyl Isobutyl Ketone	10.9	0.50	ug/g	ND	109	50-140			
Methyl tert-butyl ether	10.3	0.05	ug/g	ND	103	50-140			
Methylene Chloride	2.68	0.05	ug/g	ND	66.9	60-130			
Styrene	3.22	0.05	ug/g	ND	80.4	60-130			
1,1,1,2-Tetrachloroethane	3.89	0.05	ug/g	ND	97.2	60-130			
1,1,2,2-Tetrachloroethane	4.33	0.05	ug/g	ND	108	60-130			
Tetrachloroethylene	3.60	0.05	ug/g	ND	90.1	60-130			
Toluene	3.79	0.05	ug/g	ND	94.7	60-130			
1,1,1-Trichloroethane	2.62	0.05	ug/g	ND	65.4	60-130			
1,1,2-Trichloroethane	3.33	0.05	ug/g	ND	83.3	60-130			
Trichloroethylene	4.01	0.05	ug/g	ND	100	60-130			
Trichlorofluoromethane	2.90	0.05	ug/g	ND	72.4	50-140			
Vinyl chloride	4.30	0.02	ug/g	ND	108	50-140			
m,p-Xylenes	7.05	0.05	ug/g	ND	88.1	60-130			
o-Xylene	3.69	0.05	ug/g	ND	92.3	60-130			
Surrogate: 4-Bromofluorobenzene	*2.79*		*ug/g*		*87.3*	*50-140*			
Surrogate: Dibromofluoromethane	*2.30*		*ug/g*		*72.0*	*50-140*			
Surrogate: Toluene-d8	*2.97*		*ug/g*		*92.7*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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.

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Paracel ID: 2138242

Chain Of Custody (Lab Use Only) Nº 133103

Client Name: Paterson	Project Ref: PE5222
Contact Name: Samuel Berube	Quote #:
Address: 154 Colonnade Rd South	PO #: 33139
Telephone:	E-mail: sberube@patersongroup.ca

Page 1 of 1

Turnaround Time
- ☐ 1 day
- ☐ 3 day
- ☐ 2 day
- ☑ Regular

Date Required:

☐ REG 153/04 ☐ REG 406/19

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

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

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Time	PHCs F1-F4	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)					
1	BH1-21-SS2	1		2	Sep.10/21		✓	✓										
2	DUP-1	↓		↓	↓			✓										
3	BH2-21-SS3	↓		↓	Sep.13/21		✓	✓										
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

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Relinquished By (Print): Samuel Berubé	Date/Time: 14/09/20 3:20	Date/Time: Sep 14, 2021 04.09	Date/Time: Sept 14 2021 4:37
Date/Time:	Temperature: °C PH.	Temperature: 13.9 °C	pH Verified: ☐ By:

Chain of Custody (Env) xlsx

Revision 4.0

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Sam Berube

Client PO: 33195
Project: PE5222
Custody: 133116

Report Date: 21-Sep-2021
Order Date: 17-Sep-2021

Order #: 2138710

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

Paracel ID	Client ID
2138710-01	BH1-21-GW1
2138710-02	BH2-21-GW1
2138710-03	DUP1-GW1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 33195

Report Date: 21-Sep-2021

Order Date: 17-Sep-2021

Project Description: PE5222

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	20-Sep-21	21-Sep-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	20-Sep-21	20-Sep-21
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	20-Sep-21	21-Sep-21

Certificate of Analysis

Report Date: 21-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2021

Client PO: 33195

Project Description: PE5222

	Client ID:	BH1-21-GW1	BH2-21-GW1	DUP1-GW1	-
	Sample Date:	17-Sep-21 09:00	17-Sep-21 09:00	17-Sep-21 09:00	-
	Sample ID:	2138710-01	2138710-02	2138710-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	93.0	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	<0.2	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	122	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 21-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 17-Sep-2021

Client PO: 33195

Project Description: PE5222

	Client ID:	BH1-21-GW1	BH2-21-GW1	DUP1-GW1	-
	Sample Date:	17-Sep-21 09:00	17-Sep-21 09:00	17-Sep-21 09:00	-
	Sample ID:	2138710-01	2138710-02	2138710-03	-
	MDL/Units	Water	Water	Water	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	42.1	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
Vinyl chloride	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	-	-
4-Bromofluorobenzene	Surrogate	97.9%	99.1%	-	-
Dibromofluoromethane	Surrogate	101%	102%	-	-
Toluene-d8	Surrogate	80.2%	78.6%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	37	<25	37	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-

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	*76.7*		*ug/L*		*95.9*	*50-140*			
Surrogate: Dibromofluoromethane	*81.6*		*ug/L*		*102*	*50-140*			
Surrogate: Toluene-d8	*63.7*		*ug/L*		*79.7*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*78.5*		*ug/L*		*98.2*	*50-140*			
Surrogate: Dibromofluoromethane	*83.2*		*ug/L*		*104*	*50-140*			
Surrogate: Toluene-d8	*62.4*		*ug/L*		*78.0*	*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)	1820	25	ug/L	ND	91.2	68-117			
F2 PHCs (C10-C16)	1220	100	ug/L	ND	76.4	60-140			
F3 PHCs (C16-C34)	3310	100	ug/L	ND	84.5	60-140			
F4 PHCs (C34-C50)	1990	100	ug/L	ND	80.2	60-140			
Volatiles									
Acetone	101	5.0	ug/L	ND	101	50-140			
Benzene	38.8	0.5	ug/L	ND	97.0	60-130			
Bromodichloromethane	38.6	0.5	ug/L	ND	96.5	60-130			
Bromoform	44.2	0.5	ug/L	ND	110	60-130			
Bromomethane	33.0	0.5	ug/L	ND	82.4	50-140			
Carbon Tetrachloride	40.4	0.2	ug/L	ND	101	60-130			
Chlorobenzene	45.5	0.5	ug/L	ND	114	60-130			
Chloroform	40.4	0.5	ug/L	ND	101	60-130			
Dibromochloromethane	44.4	0.5	ug/L	ND	111	60-130			
Dichlorodifluoromethane	45.6	1.0	ug/L	ND	114	50-140			
1,2-Dichlorobenzene	37.7	0.5	ug/L	ND	94.3	60-130			
1,3-Dichlorobenzene	36.6	0.5	ug/L	ND	91.6	60-130			
1,4-Dichlorobenzene	36.8	0.5	ug/L	ND	91.9	60-130			
1,1-Dichloroethane	39.0	0.5	ug/L	ND	97.4	60-130			
1,2-Dichloroethane	39.9	0.5	ug/L	ND	99.8	60-130			
1,1-Dichloroethylene	39.2	0.5	ug/L	ND	98.0	60-130			
cis-1,2-Dichloroethylene	37.4	0.5	ug/L	ND	93.4	60-130			
trans-1,2-Dichloroethylene	37.5	0.5	ug/L	ND	93.7	60-130			
1,2-Dichloropropane	36.8	0.5	ug/L	ND	91.9	60-130			
cis-1,3-Dichloropropylene	33.4	0.5	ug/L	ND	83.5	60-130			
trans-1,3-Dichloropropylene	34.0	0.5	ug/L	ND	84.9	60-130			
Ethylbenzene	37.8	0.5	ug/L	ND	94.4	60-130			
Ethylene dibromide (dibromoethane, 1,2-	45.1	0.2	ug/L	ND	113	60-130			
Hexane	40.2	1.0	ug/L	ND	100	60-130			
Methyl Ethyl Ketone (2-Butanone)	92.4	5.0	ug/L	ND	92.4	50-140			
Methyl Isobutyl Ketone	103	5.0	ug/L	ND	103	50-140			
Methyl tert-butyl ether	108	2.0	ug/L	ND	108	50-140			
Methylene Chloride	32.2	5.0	ug/L	ND	80.4	60-130			
Styrene	42.4	0.5	ug/L	ND	106	60-130			
1,1,1,2-Tetrachloroethane	38.6	0.5	ug/L	ND	96.6	60-130			
1,1,2,2-Tetrachloroethane	40.0	0.5	ug/L	ND	100	60-130			
Tetrachloroethylene	41.4	0.5	ug/L	ND	104	60-130			
Toluene	42.4	0.5	ug/L	ND	106	60-130			
1,1,1-Trichloroethane	41.6	0.5	ug/L	ND	104	60-130			
1,1,2-Trichloroethane	38.6	0.5	ug/L	ND	96.4	60-130			
Trichloroethylene	42.3	0.5	ug/L	ND	106	60-130			
Trichlorofluoromethane	41.4	1.0	ug/L	ND	104	60-130			
Vinyl chloride	31.8	0.5	ug/L	ND	79.4	50-140			
m,p-Xylenes	67.5	0.5	ug/L	ND	84.4	60-130			
o-Xylene	43.5	0.5	ug/L	ND	109	60-130			
Surrogate: 4-Bromofluorobenzene	*64.2*		*ug/L*		*80.2*	*50-140*			
Surrogate: Dibromofluoromethane	*80.9*		*ug/L*		*101*	*50-140*			
Surrogate: Toluene-d8	*53.5*		*ug/L*		*66.9*	*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 LTD

Paracel ID: 2138710

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2138710	Nº 133116

Client Name: Paterson Group Inc.	Project Ref: PE5222	Page 1 of 1
Contact Name: Samuel Bérubé	Quote #:	Turnaround Time
Address: 154 Colonnade Road South	PO #: 33195	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone:	E-mail: sberube@patersongroup.ca kforster@patersongroup.ca	Date Required:

☐ REG 153/04 ☐ REG 406/19

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

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

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4 -BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH1-21-GW1	GW		3	Sep. 17/21		✓	✓	✓				
2	BH2-21-GW1	↓		↓	↓		✓	✓					
3	DUP1-GW1	↓		↓	↓		✓						
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: drop box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Samuel Bérubé	Date/Time:	Date/Time: 5:10 Sept 17 2021	Date/Time: Sept 17, 2021 17:41
Date/Time:	Temperature: °C	Temperature: 9.0 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Sam Berube

Client PO: 33203
Project: PE5222
Custody: 133125

Report Date: 27-Sep-2021
Order Date: 22-Sep-2021

Order #: 2139372

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

Paracel ID	Client ID
2139372-01	BH1-19-GW2
2139372-02	BH2-19-GW2
2139372-03	BH3-19-GW2

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 27-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 22-Sep-2021

Client PO: 33203

Project Description: PE5222

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	24-Sep-21	25-Sep-21

Certificate of Analysis

Report Date: 27-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 22-Sep-2021

Client PO: 33203

Project Description: PE5222

	Client ID:	BH1-19-GW2	BH2-19-GW2	BH3-19-GW2	-
	Sample Date:	22-Sep-21 09:00	22-Sep-21 09:00	22-Sep-21 09:00	-
	Sample ID:	2139372-01	2139372-02	2139372-03	-
	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	120	94.9	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylene dibromide (dibromoethane, 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	5.6	155	144	-
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

Client: Paterson Group Consulting Engineers

Client PO: 33203

Report Date: 27-Sep-2021

Order Date: 22-Sep-2021

Project Description: PE5222

	Client ID:	BH1-19-GW2	BH2-19-GW2	BH3-19-GW2	-
	Sample Date:	22-Sep-21 09:00	22-Sep-21 09:00	22-Sep-21 09:00	-
	Sample ID:	2139372-01	2139372-02	2139372-03	-
	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	55.8	44.1	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	7.1	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	91.3%	102%	98.9%	-
Dibromofluoromethane	Surrogate	117%	121%	117%	-
Toluene-d8	Surrogate	94.2%	96.3%	96.8%	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*75.4*		*ug/L*		*94.2*	*50-140*			
Surrogate: Dibromofluoromethane	*94.4*		*ug/L*		*118*	*50-140*			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.8*	*50-140*			

Certificate of Analysis

Report Date: 27-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 22-Sep-2021

Client PO: 33203

Project Description: PE5222

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	6.18	0.5	ug/L	6.62			6.9	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	14.5	0.5	ug/L	15.2			4.3	30	
Dibromochloromethane	2.68	0.5	ug/L	3.17			16.8	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
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	*74.3*		*ug/L*		*92.8*	*50-140*			
Surrogate: Dibromofluoromethane	*94.0*		*ug/L*		*118*	*50-140*			
Surrogate: Toluene-d8	*76.3*		*ug/L*		*95.4*	*50-140*			

Certificate of Analysis

Report Date: 27-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 22-Sep-2021

Client PO: 33203

Project Description: PE5222

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	107	5.0	ug/L	ND	107	50-140			
Benzene	41.3	0.5	ug/L	ND	103	60-130			
Bromodichloromethane	43.2	0.5	ug/L	ND	108	60-130			
Bromoform	34.2	0.5	ug/L	ND	85.5	60-130			
Bromomethane	39.8	0.5	ug/L	ND	99.4	50-140			
Carbon Tetrachloride	37.8	0.2	ug/L	ND	94.6	60-130			
Chlorobenzene	44.7	0.5	ug/L	ND	112	60-130			
Chloroform	39.2	0.5	ug/L	ND	98.0	60-130			
Dibromochloromethane	41.0	0.5	ug/L	ND	103	60-130			
Dichlorodifluoromethane	33.5	1.0	ug/L	ND	83.8	50-140			
1,2-Dichlorobenzene	32.3	0.5	ug/L	ND	80.8	60-130			
1,3-Dichlorobenzene	31.8	0.5	ug/L	ND	79.6	60-130			
1,4-Dichlorobenzene	31.7	0.5	ug/L	ND	79.3	60-130			
1,1-Dichloroethane	40.6	0.5	ug/L	ND	102	60-130			
1,2-Dichloroethane	35.2	0.5	ug/L	ND	88.1	60-130			
1,1-Dichloroethylene	41.5	0.5	ug/L	ND	104	60-130			
cis-1,2-Dichloroethylene	39.8	0.5	ug/L	ND	99.5	60-130			
trans-1,2-Dichloroethylene	36.3	0.5	ug/L	ND	90.7	60-130			
1,2-Dichloropropane	39.0	0.5	ug/L	ND	97.6	60-130			
cis-1,3-Dichloropropylene	44.6	0.5	ug/L	ND	112	60-130			
trans-1,3-Dichloropropylene	44.3	0.5	ug/L	ND	111	60-130			
Ethylbenzene	39.5	0.5	ug/L	ND	98.7	60-130			
Ethylene dibromide (dibromoethane, 1,2-	40.0	0.2	ug/L	ND	100	60-130			
Hexane	44.3	1.0	ug/L	ND	111	60-130			
Methyl Ethyl Ketone (2-Butanone)	119	5.0	ug/L	ND	119	50-140			
Methyl Isobutyl Ketone	109	5.0	ug/L	ND	109	50-140			
Methyl tert-butyl ether	120	2.0	ug/L	ND	120	50-140			
Methylene Chloride	38.6	5.0	ug/L	ND	96.6	60-130			
Styrene	42.4	0.5	ug/L	ND	106	60-130			
1,1,1,2-Tetrachloroethane	42.1	0.5	ug/L	ND	105	60-130			
1,1,2,2-Tetrachloroethane	42.3	0.5	ug/L	ND	106	60-130			
Tetrachloroethylene	37.4	0.5	ug/L	ND	93.6	60-130			
Toluene	42.6	0.5	ug/L	ND	106	60-130			
1,1,1-Trichloroethane	42.8	0.5	ug/L	ND	107	60-130			
1,1,2-Trichloroethane	37.7	0.5	ug/L	ND	94.3	60-130			
Trichloroethylene	45.0	0.5	ug/L	ND	113	60-130			
Trichlorofluoromethane	43.8	1.0	ug/L	ND	110	60-130			
Vinyl chloride	39.0	0.5	ug/L	ND	97.6	50-140			
m,p-Xylenes	68.9	0.5	ug/L	ND	86.1	60-130			
o-Xylene	44.5	0.5	ug/L	ND	111	60-130			
Surrogate: 4-Bromofluorobenzene	*45.3*		*ug/L*		*56.7*	*50-140*			
Surrogate: Dibromofluoromethane	*90.1*		*ug/L*		*113*	*50-140*			
Surrogate: Toluene-d8	*60.1*		*ug/L*		*75.1*	*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

PARACEL LABORATORIES

Paracel ID: 2139372

...urent Blvd.
...o K1G 4J8
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...acellabs.com
...bs.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2139372	№ 133125

Client Name: Paterson Group Inc	Project Ref: PE5222	Page __ of __	
Contact Name: Samuel Berubé	Quote #:	**Turnaround Time**	
Address: 154 Colonnade Rd South	PO #: 33203	☐ 1 day	☐ 3 day
	E-mail: sberube@patersongroup.ca	☐ 2 day	☐ Regular
Telephone:		Date Required:	

☐ REG 153/04 ☐ REG 406/19

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

Other Regulation

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

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)					
1	BH1-19-GW2	GW		3	Sep. 22/21			✓										/
2	BH2-19-GW2	↓		↓	↓			↓										/
3	BH3-19-GW2	↓		↓	↓			↓										/
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): [signature]	Received By Driver/Depot: [signature] DEOUSE	Received at Lab: Nmeqpam Dohmaj	Verified By: [signature]
Relinquished By (Print): Samuel Berubé	Date/Time: 22/09/21 2:45	Date/Time: Sep 22, 2021 03.25	Date/Time: Sep 22 2021 16.19
Date/Time:	Temperature: °C PM	Temperature: 16.0 °C	pH Verified: ☐ By: NA