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**Phase II Environmental Site Assessment**

861 Clyde Avenue  
Ottawa, Ontario

Prepared For

DOODH Milk Limited

November 13, 2020

Report: PE4936-2

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	iii
1.0 INTRODUCTION .....	1
1.1 Site Description .....	1
1.2 Property Ownership .....	1
1.3 Current Property Use .....	2
1.4 Proposed Property Use .....	2
1.5 Applicable Site Condition Standard .....	2
2.0 BACKGROUND INFORMATION .....	2
2.1 Physical Setting .....	2
2.2 Past Investigations .....	3
3.0 SCOPE OF INVESTIGATION .....	5
3.1 Overview of Site Investigation .....	5
3.2 Media Investigated .....	5
3.3 Phase I Conceptual Site Model .....	5
4.0 INVESTIGATION METHOD .....	10
4.1 Subsurface Investigation .....	10
4.2 Soil Sampling .....	10
4.3 Field Screening Measurements .....	11
4.4 Groundwater Monitoring Well Installation .....	11
4.5 Field Measurement of Water Quality Parameters .....	11
4.6 Groundwater Sampling .....	12
4.7 Analytical Testing .....	13
4.8 Residue Management .....	14
4.9 Elevation Surveying .....	14
4.10 Quality Assurance and Quality Control Measures .....	14
5.0 REVIEW AND EVALUATION .....	15
5.1 Geology .....	15
5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient .....	15
5.3 Fine/Coarse Soil Texture .....	15
5.4 Field Screening .....	15
5.5 Soil Quality .....	16
5.6 Groundwater Quality .....	16
5.7 Quality Assurance and Quality Control Results .....	17
5.8 Phase II Conceptual Site Model .....	18
6.0 CONCLUSIONS .....	25
7.0 STATEMENT OF LIMITATIONS .....	26

## **List of Figures**

Figure 1 - Key Plan

Drawing PE4936-3 – Test Hole Location Plan

Drawing PE4936-4 – Analytical Testing Plan – Soil

Drawing PE4936-4A – Cross-Section A-A' – Soil

Drawing PE4936-4B – Cross-Section B-B' – Soil

Drawing PE4936-5 – Analytical Testing Plan – Groundwater

Drawing PE4936-5A – Cross-Section A-A' – Groundwater

Drawing PE4936-5B – Cross-Section B-B' – Groundwater

## **List of Appendices**

Appendix 1    Sampling and Analysis Plan

    Analytical Test Results

    Soil Profile and Test Data Sheets

    Symbols and Terms

    Laboratory Certificates of Analysis

## **EXECUTIVE SUMMARY**

### **Assessment**

A Phase II ESA was conducted for 861 Clyde Avenue, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address the APECs that were identified during the Phase I ESA. The subsurface investigation consisted of drilling 13 boreholes, all of which were instrumented with groundwater monitoring wells.

Based on the historical soil samples and the analytical test results obtained as part of the Phase II ESA, impacted soil is present on the western portion of the Phase II ESA property. The impacted soil is generally expected to be contained to areas not previously remediated, mostly beneath the current building footprint. Any soil impacts encountered as part of the Phase II ESA are expected to extend from beneath the pavement structure to the bedrock surface.

Groundwater samples recovered from the monitoring wells installed in the western portion of the Phase II ESA property were observed to be impacted with benzene. These groundwater results are consistent with the groundwater results previously identified by others as part of the historical investigative work on the site. The chloroform results are considered to be related to the use of municipal groundwater during the coring process. The chloroform concentrations are not considered to exceed the applicable standards.

### **Conclusion**

Based on the findings of the Phase II ESA, impacted soil and groundwater remain present on site. A soil and groundwater remedial action plan will be prepared and implemented in accordance with O.Reg.153/04 prior to the filing of a Record of Site Condition, required for the proposed residential development.

The impacted soil and groundwater are not considered to impact the current use of the Phase II ESA property. As such, remedial actions will be designed and implemented once redevelopment plans have been finalized.

## 1.0 INTRODUCTION

At the request of DOODH Milk Inc., Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment of 861 Clyde Avenue, in the City of Ottawa, Ontario. The purpose of this Phase II ESA has been to address areas of potential environmental concern (APECs) identified on the Phase II Property, during a Phase I ESA conducted by Paterson.

### 1.1 Site Description

Address:	861 Clyde Avenue, Ottawa, Ontario.
Legal Description:	Part of Lots 159, 160, 161, 190, 191, 192, 194, and 195. Part of Bellevue Avenue (Closed). Part of Reserved and Lanes (Closed) Lots 144 to 152 (all Inclusive), Lots 162 to 171 (All Inclusive), Lots 185 to 189 (All Inclusive), Lots 199 to 201 (All Inclusive), Registered Plan 367 and Part of Lot I Concession A (Rideau Front), City of Ottawa.
Location:	The subject site is located on the east side of Clyde Avenue north of Highway 417, in the City of Ottawa, Ontario.
UTM 18T:	441 433 E 502 5165 N
Configuration:	Irregular
Site Area:	2.7 ha (approximate)
Zoning:	AM H(30) Arterial Mainstreet Zone
Current Use:	The subject site is currently unused industrial land.
Services:	The subject site is in a municipally serviced area.

### 1.2 Property Ownership

The current owner of the site is DOODH MILK Inc. Paterson was retained to complete this Phase II ESA by Vincent Denomme of DOODH MILK Inc. DOODH's offices are located at 210 Gladstone Avenue, Ottawa, Ontario. Mr. Denomme can be reached by telephone at (613) 233-6030.

### **1.3 Current Property Use**

The Phase II ESA property is currently vacant and unused. The property is considered to be a commercial use based on the last usage of the site as a milk processing facility.

### **1.4 Proposed Property Use**

It is our understanding that the subject site is to be redeveloped with mixed-use residential buildings. Due to the conversion to a more sensitive land use, a Record of Site Condition (RSC) will be required.

### **1.5 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 site conditions
- ☐ Non-potable groundwater conditions
- ☐ Residential land use

Coarse grained soil standards were chosen based on field observations. Grain size analysis was not completed.

## **2.0 BACKGROUND INFORMATION**

### **2.1 Physical Setting**

The subject property is situated in a commercial neighbourhood. The surface of the site consists mainly of asphalt parking areas, with small landscaped areas along Clyde Avenue.

The site and regional topography are generally flat, with a slight slope to the east. Water drainage on the subject site occurs primarily via overland flow in the paved areas to catch basins on the Phase II ESA property and adjacent roadways.

## 2.2 Past Investigations

The following reports were reviewed as part of the Phase I ESA prior to conducting this assessment:

- ❑ “Phase II Environmental Site Assessment, 861 Clyde Avenue, Ottawa, Ontario”, prepared by Golder Associates Ltd. and dated October of 2008. Prepared for: Saputo Inc.

A Phase II-ESA program was conducted for a portion of the 861 Clyde Avenue property to address former diesel/gasoline underground storage tanks (USTs) and pump islands located to the south of former service garage. The program consisted of drilling seven boreholes, five of which were instrumented with monitoring wells. Seven soil samples were submitted for analytical testing of PHCs and VOCs. Concentrations of ethylbenzene and xylene were detected in all but two soil samples above MECP Table 7 Standards. Concentrations of PHC F2 were detected in several soil samples, two of which were above MECP Table 7 Standards. All remaining soil samples were in compliance with the MECP Standards for PHCs and VOCs. Groundwater monitoring indicated that free product was present on the groundwater obtained from one of the monitoring wells, while a hydrocarbon sheen was noted on the purge water collected from the remaining four monitoring wells. Five groundwater samples were submitted for analytical testing of PHCs. Benzene, ethylbenzene, and toluene concentrations exceeded the MECP Table 1 Standards in all groundwater samples collected. Xylene concentrations exceeded MECP Table 1 Standards in all but one of the groundwater samples. The groundwater at all five monitoring wells was considered to not meet MECP standards.

Based on the analytical test results, additional investigative work was recommended prior to or concurrently with the redevelopment of the site.

- ❑ “Underground Storage Tank Closure Report, Saputo Dairy Facility, 861 Clyde Avenue, Ottawa, Ontario”, prepared by VTX Consulting Services Inc. and dated September of 2016. Prepared for Weston Foods (Canada) Inc.

The program consisted of the removal of a 25,000L UST and associated piping, approximately 5,278 metric tonnes of impacted soil and 70 metric tonnes of impacted bedrock. The resulting excavation was approximately 1510m<sup>2</sup> in area. Twenty-three sidewall confirmatory soil samples were collected from the walls of the final excavation. All sidewall confirmatory samples were below the applicable MECP Table 7 standards with the exception of one sample that was collected

from below the building foundation at a loading dock. The residual soil impacts beneath the foundation were to be addressed with In-Situ Chemical Oxidation.

Thirteen groundwater monitoring wells were installed to assess groundwater conditions within the UST excavation. Initial groundwater sampling results identified PHC impacted groundwater beyond the excavation boundaries. Remediation of the PHC impacted groundwater was being conducted utilizing In-Situ Chemical Oxidation.

- “Remedial Excavation Program – 861 Clyde Avenue, Ottawa, ON”, Prepared by Golder Associates Ltd. and dated October of 2018. Prepared for Saputo Dairy Products Canada G.P.

A remedial excavation program was conducted in the loading dock area at 861 Clyde Avenue to address a diesel fuel spill from a transport trailer. A shallow soil sampling program conducted prior to the remedial excavation program, identified PHC impacted soil over an area approximate 40 m<sup>2</sup> and extending to a depth of approximately one meter below grade. Five confirmatory soil samples were submitted for testing of BTEX and PHC. The analytical results indicated that all samples satisfied MECP Standards and that clean limits were achieved during the remedial excavation program. Site restoration activities carried out following remediation included backfilling the base of the excavation with approximately forty-four metric tonnes of clear stone followed by eighty-two metric tonnes of Granular A.

- “Technical Memorandum - #13, 861 Clyde Avenue, Ottawa, Ontario, Canada”, prepared by VTX Consulting Services Inc. and dated October of 2019. Prepared for West Foods (Canada) Inc.

A fifth performance sampling round was conducted to evaluate the effect of the in-situ remediation injection events performed on site. Measurable free phase PHC product was detected at a monitoring well located in the maintenance room, on the south side of the building. PHC product was also observed smeared on the surface of the interface probe in two of the monitoring wells in the vicinity of the maintenance room. The program consisted of sampling ninety-four monitoring wells, twelve of which did not demonstrate sufficient groundwater recharge to allow sampling and fifteen of which were not able to be sampled because they were either dry, had measurable free phase product identified during sampling, were inaccessible or had insufficient groundwater for the purpose of sampling.

In total samples exceeding the MECP Table 7 Standards in PHC F1-F3, and benzene were reported in twenty-nine monitoring wells..



It was reported that contaminant concentrations in the majority of wells indicated a stable or decreasing trend compared with the previous monitoring event.

### **3.0 SCOPE OF INVESTIGATION**

#### **3.1 Overview of Site Investigation**

The subsurface investigation was conducted on July 10, 13, 14, 15, and 29<sup>th</sup>, 2020. The field program consisted of drilling 13 boreholes, all of which were instrumented with a groundwater monitoring well. Boreholes were drilled to depths ranging from 5.43m to 15.26 m below the existing grade.

#### **3.2 Media Investigated**

During the subsurface investigation, soil and groundwater samples were obtained and submitted for laboratory analysis. The rationale for sampling and analyzing this media is based on the Contaminants of Potential Concern identified in the Phase I ESA. Contaminants of potential concern for soil and/or groundwater include petroleum hydrocarbons (PHCs, Fractions F<sub>1</sub> - F<sub>4</sub>), benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and metals.

#### **3.3 Phase I Conceptual Site Model**

##### **Geological and Hydrogeological Setting**

The Phase I-ESA property is located in an area of silty sand deposits with bedrock between 1 and 3 m below existing ground surface. Based on the results of previous subsurface investigations at the site, the groundwater table is expected to be encountered within the bedrock layer at depths ranging from approximately 1 to 4 m below the existing grade.

##### **Contaminants of Potential Concern**

Based on the past uses of the subject site, the following Contaminants of Potential Concern (CPCs) have been identified:

- Petroleum Hydrocarbons Fractions 1 through 4 (PHCs F<sub>1</sub>-F<sub>4</sub>)
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)
- Metals (including Hg, Cr VI, and B Available (where applicable))
- Polycyclic Aromatic Hydrocarbons (PAHs)

- Polychlorinated Biphenyls (PCBs)

The primary mechanism of contaminant transport within the site soils is considered to be leaching. Physical transport is not anticipated to affect contaminant transport at the subject site, given that the subject site is no longer in use.

The mechanisms of contaminant transport within the groundwater system include advection, dispersion, and diffusion. Advection and dispersion will be the dominant mechanisms of contaminant transport in soils with higher hydraulic conductivities, such as the fill material within the service trenches or tank beddings, whereas diffusion will dominate in subsurface conditions with lower hydraulic conductivity, such as clays or competent bedrock.

### **Existing Buildings and Structures**

Existing buildings and structures present on the subject property are associated with the former use of the site as a manufacturing facility. The buildings and structures are inferred to have been built prior to 1958, during the original development of the property, or as part of the addition constructed on the east end of the original building between 1999 and 2005. The existing buildings and structures observed at the time of the site visit are described below.

The exterior of the original building was clad with concrete blocks. A single man door is used for access on the north side of the building. This building was vacant and not in use at the time of the site visit. The inferred former use of the building was for storage, manufacturing, and distribution of dairy products. The presence of cooler rooms infers the cold storage of temperature-sensitive products. The western portion of the main building contained several offices.

Production of dairy products was conducted in the eastern portion of the main building. It is presumed that ammonia, sulfuric acid and glycol were previously stored within the building, as several large containers were observed at the time of the site visit, however they were observed to be empty.

A water source was identified in the building. 73 drains were identified within the main building at the time of the site visit. 3 sump pits were identified within the main building at the time of the site visit. No signs of aboveground or underground storage tanks were identified during the site inspection.

Several additional buildings and structures were adjacent to the southern portion of the main building. The recent addition is steel framed and clad with metal siding. It is located on the eastern portion of the property, attached to the original

building. The addition was assumed to be used for the distribution and storage of the products manufactured on-site. Several loading bays were observed at the time of site visit. The building has a footprint of approximately 9200m<sup>2</sup>.

Three additional small structures are connected to the southern portion of the building, abutting the milk processing area of the facility. It is presumed that these structures were used to store ammonia and sulfuric acid previously used on-site; these structures were not accessible at the time of the site visit and it could not be determined if they are currently used for chemical storage. A large silo present along the eastern portion of the building, is likely to have previously been used in tandem with the low-pressure steam process used for in past manufacturing operations on-site.

### **Water Bodies**

No creeks, rivers, streams, lakes or any other water body was identified in the Phase I Study Area. The majority of the study area consists of commercial and residential properties and roadways. Past known land use in the study area is residential, commercial, and agricultural. The Ottawa River is the closest significant water body and is present approximately 1700 m north of the site.

### **Areas of Natural Significance**

A search for areas of natural significance and features within the Phase I-ESA study area was conducted on the Ontario Ministry of Natural Resources (MNR) website. The search did not reveal any areas of natural significance within the Phase I-ESA study area.

### **Drinking Water Wells**

A search of the MECP website for all drilled well records within 250 m of the subject site was conducted on October 16, 2020. The MECP response returned 280 well records within the Phase I-ESA study area. The majority of these records appear to be for monitoring wells. Many of these records pertain to monitoring wells located on the Phase I ESA property for environmental testing. Given the presence of municipal water services within the subject area, our interpretation is that there are currently no drinking water wells located within the Phase I-ESA study area.

According to the water well records, generalized stratigraphy consists of overburden soil described as sand or clay overlying limestone bedrock. Records considered to be associated with monitoring wells, in general, were approximately less than 5m in depth. Water level details were not provided in all well records.

A water well records search was also included as part of the ERIS search. No new information was identified during a review of the ERIS records.

## Neighbouring Land Use

Neighbouring land use in the Phase I-ESA study area is currently primarily commercial, with residential properties. Multiple potentially contaminating activities (PCAs) were identified within the Phase I-ESA study area. These activities generally consist of existing and historical garages, body shops, light industrial facilities and car dealerships. Based on the separation distance from the subject site and/or inferred cross-gradient or downgradient locations, the majority of these PCAs are not considered to have the potential to impact the subject site.

## Potentially Contaminating Activities and Areas of Potential Environmental Concern

<b>Table 1 - Areas of Potential Environmental Concern</b>					
<b>Area of potential environmental concern</b>	<b>Location of area of potential environmental concern on phase one property</b>	<b>Potentially contaminating activity</b>	<b>Location of PCA (on-site or off-site)</b>	<b>Contaminants of potential concern</b>	<b>Media potentially Impacted (Ground water, soil and/or sediment)</b>
Known Impacted Soil APEC 1	Southwest corner of Phase I ESA property	NA	On-site	PHCs, BTEX	Soil
Former Underground Storage Tank APEC 2	Southwest corner of Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	PHCs, BTEX	Soil, Groundwater
Former Transformer APEC 3	Southwest corner of Phase I ESA property	Item 55 – Transformer Manufacturing, Processing and Use	On-site	PCBs, PHCs, BTEX	Soil, Groundwater
Former Remediation APEC 4	Southwest corner of Phase I ESA property	NA	On-site	PHCs, BTEX	Soil
Former Underground Storage Tank APEC 5	Northwest corner of Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	PHCs, BTEX	Soil, Groundwater
Former Pump Island APEC 6	Northwest corner of Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	PHCs, BTEX	Soil, Groundwater

<b>Table 1 - Areas of Potential Environmental Concern</b>					
<b>Area of potential environmental concern</b>	<b>Location of area of potential environmental concern on phase one property</b>	<b>Potentially contaminating activity</b>	<b>Location of PCA (on-site or off-site)</b>	<b>Contaminants of potential concern</b>	<b>Media potentially impacted (Ground water, soil and/or sediment)</b>
Former Equipment Service Garage APEC 7	Northwest corner of Phase I ESA property	Item 52 – Storage, Maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	On-site	PHCs, BTEX	Soil, Groundwater
Former Remediation APEC 8	Northwest corner of Phase I ESA property	NA	On-site	PHCs, BTEX	Soil, Groundwater
Known Impacted Groundwater Plume APEC 9	West portion of Phase I ESA property	NA	On-site	BTEX	Groundwater
Fill Material of Unknown Quality APEC 10	Entire Phase I ESA property	Item 30 – Importation of Fill Material of Unknown Quality	On-site	Metals	Soil
Existing Automotive Service Garage APEC 11	Northwest corner of Phase I ESA property	Item 10 – Commercial Autobody Shops	Off-site	PHCs, BTEX	Groundwater
Former Automotive Service Garage APEC 12	Northeast corner of Phase I ESA property	Item 52 – Storage, Maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-site	PHCs, BTEX	Groundwater
Existing Automotive Service Garages APEC 12	West property line of Phase I ESA property	Item 10 – Commercial Autobody Shops	Off-site	PHCs, BTEX	Groundwater

Additional PCAs within the Phase I-ESA study area are shown on Drawing PE4936-1 – Surrounding Land Use; as discussed above, these PCAs are not considered to have the potential to impact the Phase I ESA property.

### **Underground Utilities**

Multiple underground utilities were identified on the subject site including public electrical, gas, and communications connections. Private services observed on

site include electrical and sewer services. Fire department connections and catch basins for drainage are located throughout the Phase I-ESA property.

### **Assessment of Uncertainty and/or Absence of Information**

The information available for review as part of the preparation of this Phase I-ESA is considered to be sufficient to conclude that there are APECs on the subject site which may potentially have impacted the subject site. The presence of PCAs was confirmed by a variety of independent sources, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

## **4.0 INVESTIGATION METHOD**

### **4.1 Subsurface Investigation**

The subsurface investigation was conducted on July 10, 13, 14, 15, and 29<sup>th</sup>, 2020. The field program consisted of drilling 13 boreholes, all of which were instrumented with groundwater monitoring wells. Boreholes were drilled to depths ranging from 5.43m to 15.26 m below the existing grade.

The boreholes were placed to address the aforementioned APECs. The boreholes were drilled using a CME powered drill rig supplied by Downing Drilling of Hawkesbury, Ontario. Borehole locations are shown on Drawing PE4936-3 – Test Hole Location Plan, appended to this report.

### **4.2 Soil Sampling**

A total of 41 soil samples were obtained from the boreholes by means of sampling from split spoon sampling and grab samples. The depths at which grab samples, split spoon samples, and rock core samples were obtained from the boreholes are shown as “AU”, “SS”, and “RC” respectively on the Soil Profile and Test Data Sheets, appended to this report.

Site soils generally consist of fill material (comprised of brown silty sand with crushed stone), underlain by discontinuous glacial till and limestone bedrock with interbedded shale. Fill material was identified in all boreholes. All boreholes on the Phase II ESA property were cored into the bedrock to facilitate the installation of groundwater monitoring wells.

The fill material identified during the field program is an APEC on the Phase II ESA property.

### 4.3 Field Screening Measurements

A Photo Ionization Detector was used to measure the vapour concentrations in the headspace of all soil samples obtained from the boreholes. The soil vapours were measured by inserting the analyzer probe into the nominal headspace above the soil sample. Samples were then agitated, and the peak readings recorded.

The combustible vapour readings were generally less than 100ppm in the soil samples obtained and were not considered to be indicative of potential hydrocarbon impacts. No obvious staining or odours were noted in the soil samples. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

### 4.4 Groundwater Monitoring Well Installation

Thirteen groundwater monitoring wells were installed on the subject site as part of the Phase II investigation. The monitoring wells consisted of 32 mm diameter Schedule 40 threaded PVC risers and screens. A summary of the monitoring well construction details are listed in the table below and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

<b>Table 2 - Monitoring Well Construction Details</b>						
<b>Well ID</b>	<b>Ground Surface Elevation (m ASL)</b>	<b>Total Depth (m BGS)</b>	<b>Screened Interval (m BGS)</b>	<b>Sand Pack (m BGS)</b>	<b>Bentonite Seal (m BGS)</b>	<b>Casing Type</b>
BH1-20	77.52	14.96	11.96-14.96	11.66-14.96	0.30-11.66	Flushmount
BH2-20	77.41	5.51	2.51-5.51	2.21-5.51	0.30-2.21	Flushmount
BH3-20	78.05	5.97	2.97-5.97	2.67-5.97	0.30-2.67	Flushmount
BH4-20	78.48	6.02	3.02-6.02	2.72-6.02	0.30-2.72	Flushmount
BH5-20	77.79	15.24	12.24-15.24	11.94-15.24	0.30-11.94	Flushmount
BH6-20	77.59	6.02	3.02-6.02	2.72-6.02	0.30-2.72	Flushmount
BH7-20	78.24	5.84	4.34-5.84	4.04-5.84	0.30-4.04	Flushmount
BH8-20	78.05	5.64	4.14-5.64	3.84-5.64	0.30-3.84	Flushmount
BH9-20	78.06	5.89	2.89-5.89	2.59-5.89	0.30-2.59	Flushmount
BH10-20	78.32	15.16	12.16-15.16	11.86-15.16	0.30-11.86	Flushmount
BH11-20	77.95	5.54	2.5-5.24	2.24-5.54	0.03-2.24	Flushmount
BH12-20	78.49	15.26	12.26-15.26	11.96-15.26	0.30-11.96	Flushmount
BH13-20	77.79	5.43	2.43-5.43	2.13-5.43	0.30-2.13	Flushmount

### 4.5 Field Measurement of Water Quality Parameters

Groundwater sampling was conducted on July 28, 2020 and August 5, 2020. No water quality parameters were measured in the field at that time.

## **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

The following soil and groundwater samples were submitted for analysis:

Table 3 - Soil Samples Submitted						
Sample ID	Sample Depth & Stratigraphic Unit	Parameters Analyzed				Rationale
		PHCs (F <sub>1</sub> -F <sub>4</sub> )	BTEX	Metals <sup>1</sup>	PAH	
BH1-20-SS3	1.50-2.01	X	X			Assess the remediation and former service garage
BH2-20-SS2	0.75-1.25			X		Assess the soil remediation backfill quality
BH3-20-SS3	1.50-2.01	X	X			Assess the former service garage
BH6-20-SS2	0.75-1.25			X <sup>2</sup>	X	Assess the fill material
BH6-20-SS4	2.13-2.33	X	X			Assess the offsite environmental concerns and onsite soil quality
BH7-20-AU1	0.00-0.51			X		Assess the fill material
BH7-20-SS5	3.00-3.22	X	X			Assess the remediation
BH8-20-SS3	1.50-2.10	X	X			Assess the remediation
BH9-20-SS2	0.80-1.40			X <sup>2</sup>	X	Assess the former UST
BH11-20-SS3	1.50-2.01	X	X			Assess the former UST
DUP	1.50-2.01	X	X			QA/QC
BH12-20-SS2	0.70-1.20			X <sup>2</sup>	X	Assess the fill material
BH12-20-SS4	2.30-2.62	X	X			Assess the offsite environmental concerns and onsite soil quality
1- Metals, including CrVI and Hg. 2- Metals, Including CrVI, Hg, EC, SAR						

<b>Table 4 - Groundwater Samples Submitted</b>						
Sample ID	Screened Interval & Stratigraphic Unit	Parameters Analyzed				Rationale
		PHCs (F <sub>1</sub> -F <sub>4</sub> )	BTEX	VOCs	PAHs	
BH1-GW1	11.96-14.96	X	X	X		Vertical Delineation of known impacts
BH2-GW1	2.51-5.51	X	X	X		Horizontal Delineation of known impacts
BH3-GW1	2.51-5.51	X	X	X		
BH4-GW1	3.02-6.02	X	X	X		
BH5-GW1	12.24-15.24	X	X	X		Vertical Delineation of known impacts
BH6-GW1	3.02-6.02	X	X	X	X	Horizontal Delineation of known impacts
BH7-GW1	4.34-5.84	X	X	X	X	
BH8-GW1	4.14-5.64	X	X	X		
BH9-GW1	2.89-5.89	X	X	X		
BH11-GW1	2.54-5.54	X	X	X		
BH12-GW1	12.26-15.26	X	X	X		Vertical Delineation of known impacts
BH13-GW1	2.43-5.43	X	X	X		Horizontal Delineation of known impacts
DUP		X	X	X		QA/QC

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

Borehole elevations were surveyed to a geodetic elevation using a GPS survey unit.

## 4.10 Quality Assurance and Quality Control Measures

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

## 5.0 REVIEW AND EVALUATION

### 5.1 Geology

Site soils generally consist of fill material (consisting of silty sand with gravel) followed by glacial till or limestone bedrock. Groundwater was encountered between 1.01m and 3.28m m below the existing grade. Site geology details are provided in the Soil Profile and Test Data Sheets in Appendix 1.

### 5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling event on July 28 and August 5, 2020 using an electronic water level meter. Groundwater levels are summarized below in Table 4.

Table 5 - Groundwater Level Measurements				
Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH1-20	77.52	1.36	76.16	July 28, 2020
BH2-20	77.41	1.01	76.4	July 28, 2020
BH3-20	78.05	1.78	76.27	July 28, 2020
BH4-20	78.48	2.18	76.3	July 28, 2020
BH5-20	77.79	1.46	76.33	July 28, 2020
BH6-20	77.59	1.93	75.66	July 28, 2020
BH7-20	78.24	3.28	74.96	July 28, 2020
BH8-20	78.05	2.83	75.22	July 28, 2020
BH9-20	78.06	2.82	75.24	July 28, 2020
BH10-20	78.32	2.88	75.44	July 28, 2020
BH11-20	77.95	2.64	75.31	July 28, 2020
BH12-20	78.49	2.78	75.71	July 28, 2020
BH13-20	77.79	1.82	75.97	August 5, 2020

Based on the water levels and configuration of the borehole locations, the groundwater flows in a southeasterly direction.

### 5.3 Fine/Coarse Soil Texture

No grain size analysis was completed for the subject site. Coarse grained soil standards were chosen based on the observed conditions.

### 5.4 Field Screening

Field screening of the soil samples collected during the drilling resulted in minimal vapour readings, the results of which are not considered to represent highly impacted soil. 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**

Seven soil samples and one duplicate were submitted for analysis of BTEX and PHCs (F<sub>1</sub>-F<sub>4</sub>), three soil samples were submitted for PAH analysis, five soil samples were submitted for metals analysis, and three samples for EC/SAR analysis. The results of the analytical testing are presented in Tables 1A, 3A, and 4A in Appendix 1. The laboratory certificates of analysis are also provided in Appendix 1.

### **PHC and BTEX**

Two soil samples (BH7-20-SS5 and BH12-20-SS4) exceeded the MECP Table 7 Standards for PHC F3. All other soil samples submitted for PHC and BTEX analysis were in compliance with the MECP Table 7 Standards.

### **Metals (including CrVI and Hg)**

All soil samples analysed for metals (including CrVI and Hg) are in compliance with the MECP Table 7 Standards.

### **PAHs**

Multiple PAH parameters identified in sample BH9-20-SS2 exceeded the MECP Table 7 Standards. All other soil samples submitted for PAH analysis are in compliance with the MECP Table 7 Standards.

### **EC/SAR**

All soil samples analysed for EC/SAR are in compliance with the MECP Table 7 Standards.

## **5.6 Groundwater Quality**

Twelve groundwater samples and one duplicate sample were submitted for VOC (including BTEX) analysis, twelve groundwater samples were submitted for PHC (F<sub>1</sub>-F<sub>4</sub>) analysis, and four groundwater samples were submitted for PAH analysis.

### **VOCs (including BTEX)**

Five groundwater samples (BH1, BH2, BH3, BH4, and BH5) exceeded the MECP Table 7 Standards for benzene. Three groundwater samples (BH1, BH5, and BH12) exceeded the MECP Table 7 Standards for chloroform. All other groundwater samples were in compliance with the MECP Table 7 Standards.

The chloroform concentrations in the groundwater are considered to be an artifact of the municipal water used during the bedrock coring process and are not considered to exceed the standards.

### **PHCs**

Four groundwater samples (BH2, BH3, BH6, and BH9) exceeded the MECP Table 7 Standards for PHC F1. All other groundwater samples submitted for PHC analysis are in compliance with the MECP Table 7 Standards.

### **PAHs**

All groundwater samples submitted for PAHs comply with the MECP Table 7 Standards.

## **5.7 Quality Assurance and Quality Control Results**

All samples submitted as part of this Phase II ESA were handled in accordance with the Analytical 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 by the Environmental Protection Act, a Certificate of Analysis has been received for each sample submitted for analysis and all Certificates of Analysis are appended to this report.

As per the Sampling and Analysis Plan, a duplicate groundwater sample was obtained during the soil and groundwater sampling events.

The parameter concentrations for both the original and duplicate samples were below the laboratory detection limits, and as such, are considered acceptable. As a result, the quality of the field data collected during this Phase II ESA is considered to be sufficient to meet the overall objectives of this assessment.

## Deviations from the Sampling and Analysis Plan

One deviation from the sampling and analysis plan was identified during the field program. Due to the presence of underground services it was not possible to drill a borehole within the area of the former transformer. Soil samples from this location were therefore not submitted for analytical testing as per the Sampling and Analysis Plan. The APEC associated with the former transformer will be investigated in conjunction with future remediation program work.

## 5.8 Phase II Conceptual Site Model

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

### Site Description

#### Potentially Contaminating Activity and Areas of Potential Environmental Concern

Table 6 - Areas of Potential Environmental Concern					
Area of potential environmental concern	Location of area of potential environmental concern on phase one property	Potentially contaminating activity	Location of PCA (on-site or off-site)	Contaminants of potential concern	Media potentially Impacted (Ground water, soil and/or sediment)
Known Impacted Soil APEC 1	Southwest corner of Phase I ESA property	NA	On-site	PHCs, BTEX	Soil
Former Underground Storage Tank APEC 2	Southwest corner of Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	PHCs, BTEX	Soil, Groundwater
Former Transformer APEC 3	Southwest corner of Phase I ESA property	Item 55 – Transformer Manufacturing, Processing and Use	On-site	PCBs, PHCs, BTEX	Soil, Groundwater
Former Remediation APEC 4	Southwest corner of Phase I ESA property	NA	On-site	PHCs, BTEX	Soil
Former Underground Storage Tank APEC 5	Northwest corner of Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	PHCs, BTEX	Soil, Groundwater

<b>Table 6 - Areas of Potential Environmental Concern</b>					
<b>Area of potential environmental concern</b>	<b>Location of area of potential environmental concern on phase one property</b>	<b>Potentially contaminating activity</b>	<b>Location of PCA (on-site or off-site)</b>	<b>Contaminants of potential concern</b>	<b>Media potentially Impacted (Ground water, soil and/or sediment)</b>
Former Pump Island APEC 6	Northwest corner of Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	PHCs, BTEX	Soil, Groundwater
Former Equipment Service Garage APEC 7	Northwest corner of Phase I ESA property	Item 52 – Storage, Maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	On-site	PHCs, BTEX	Soil, Groundwater
Former Remediation APEC 8	Northwest corner of Phase I ESA property	NA	On-site	PHCs, BTEX	Soil, Groundwater
Known Impacted Groundwater Plume APEC 9	West portion of Phase I ESA property	NA	On-site	BTEX	Groundwater
Fill Material of Unknown Quality APEC 10	Entire Phase I ESA property	Item 30 – Importation of Fill Material of Unknown Quality	On-site	Metals	Soil
Existing Automotive Service Garage APEC 11	Northwest corner of Phase I ESA property	Item 10 – Commercial Autobody Shops	Off-site	PHCs, BTEX	Groundwater
Former Automotive Service Garage APEC 12	Northeast corner of Phase I ESA property	Item 52 – Storage, Maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-site	PHCs, BTEX	Groundwater
Existing Automotive Service Garages APEC 12	West property line of Phase I ESA property	Item 10 – Commercial Autobody Shops	Off-site	PHCs, BTEX	Groundwater

Other off-site PCAs within the 250m study area are not considered to have the potential to pose an environmental concern to the subject site.

## **Contaminants of Potential Concern**

Contaminants of potential concern associated with the aforementioned PCAs include the following:

### **Soil**

- ☐ PHC (F1-F4)
- ☐ BTEX
- ☐ PAHs
- ☐ Metals (including CrVI and Hg)
- ☐ PCBs

### **Groundwater**

- ☐ PHC (F1-F4)
- ☐ BTEX
- ☐ PAHs

## **Subsurface Structures and Utilities**

Multiple underground utilities were identified on the subject site including public electrical, gas, and communications connections. Private services observed on site include electrical and sewer services. Catch basins for drainage are located throughout the Phase I-ESA property. No other subsurface structures are known to exist on the site.

## **Physical Setting**

### **Site Stratigraphy**

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

- ☐ Fill material generally consisting of silty sand, gravel and trace debris extending to depths from approximately 0.60m below the existing grade to the bedrock surface.
- ☐ Intermittent silty sand and gravel was generally encountered between the fill material and bedrock. This material was generally observed to be less than 1m in thickness.



- ☐ Limestone Bedrock with interbedded shale was encountered less than 2m below the existing grade. This unit was the deepest unit investigated and is considered to represent the main aquifer at the site.

### **Hydrogeological Characteristics**

Groundwater at the Phase II ESA property was encountered within the bedrock. This unit is interpreted to function as a local aquifer at the subject site.

Groundwater levels were measured at the subject site on July 28 and August 5, 2020, with groundwater encountered between 1.01m and 3.28m below the existing grade. Based on the water levels, a hydraulic gradient and flow direction was calculated. The groundwater on the site flows towards the southeast.

### **Approximate Depth to Bedrock**

Bedrock was generally encountered at an approximate depth of 2m below the existing ground surface of the Phase II Property.

### **Approximate Depth to Water Table**

The depth to the water table at the subject site varies between approximately 1.01m and 3.28m below the existing grade.

Put Section 35

### **Sections 41 and 43.1 of the Regulation**

Section 41 of the Regulation does not apply to the subject site as there are no areas of natural significance or bodies of water located on the subject site or within 30 m of the subject site and the pH values of surface and subsurface soils are 7.93 and 7.61. The subject site is not considered to be environmentally sensitive.

Section 43.1 of the Regulation does apply to the subject site as bedrock is located less than 2m from the existing ground surface.

### **Fill Placement**

Fill material was identified on the RSC property during the Phase I ESA site visit. Observable fill material at the time of the Phase I ESA consisted of silty sand with gravel and crushed stone.

Fill material observed as part of the subsurface investigation is of unknown quality, silty sand with crushed stone and cobbles. The fill material found on-site during is considered to represent an APEC.

### **Proposed Buildings and Other Structures**

It is our understanding that the subject site is to be use for mixed-use residential buildings with an underground parking structure footprint covering the majority of the Phase II ESA property. No additional information about the layout of these buildings was available at the time of issuance of this report. Due to the conversion to a more sensitive land use, a Record of Site Condition (RSC) will be required.

### **Existing Buildings and Structures**

All buildings and structures are associated with the former use of the facility as a manufacturing facility. The construction of any buildings or structures on the subject site are inferred to have been built prior to 1958 during the original development of the property or as part of the addition constructed on the east end of the original building between 1999 and 2005. A large manufacturing facility for dairy products was observed on-site at the time of the site visit. The following buildings and structures were observed on the subject property:

The exterior of the original building was clad with concrete blocks. A single man door is used for access on the north side of the building. This building was vacant and not in use at the time of the site visit. the inferred former use of the building was for storage, manufacturing, and distribution of dairy products. The presence of cooler rooms infers the cold storage of sensitive products. The western portion of the main building contained several offices. Production of dairy products was conducted in the eastern portion of the main building. It is presumed that ammonia, sulfuric acid and glycol were previously stored within the building, as several large containers were observed at the time of the site visit, however they were observed to be empty. Several additional buildings and structures were attached along the southern portion of the main building. A water source was identified in the building. 73 drains were identified within the main building at the time of the site visit. 3 sump pits were identified within the main building at the time of the site visit. No signs of aboveground or underground storage tanks were identified during the site inspection.

The recent addition is steel framed and clad with metal siding. It is located on the eastern portion of the property, attached to the original building. The addition was assumed to be used for the distribution and storage of the products

manufactured on-site. Several loading bays were observed at the time of site visit. The building has a footprint of approximately 9200m<sup>2</sup>.

Three additional small structures are connected to the southern portion of the building, abutting the milk processing area of the facility. It is presumed that these structures are to store the ammonia and sulfuric acid that were used on-site at the time of operation; however, it is uncertain if they are currently containing any chemicals. A large silo can be seen along the eastern portion of the building, presumably used in tandem with the low-pressure steam process used for manufacturing, at the time of operation on-site.

### **Areas of Natural Significance and Water Bodies**

No areas of natural significance or water bodies are present on or within the Phase I ESA study area.

## **Environmental Condition**

### **Areas Where Contaminants are Present**

Based on the analytical test results, impacted soil and groundwater was identified on the western portion of the Phase II ESA property.

### **Types of Contaminants**

Based on the results of the Phase II ESA the contaminants of concern on the Phase II ESA property are considered to be the following;

#### **Soil**

- ☐ PHC (F1-F4)
- ☐ BTEX
- ☐ PAHs
- ☐ Metals (including CrVI and Hg)
- ☐ PCBs

#### **Groundwater**

- ☐ PHC (F1-F4)
- ☐ BTEX
- ☐ PAHs

### **Contaminated Media**

Based on the findings of the subsurface investigations the soil and groundwater at the Phase II ESA property is contaminated.

### **What Is Known About Areas Where Contaminants Are Present**

Based on the analytical results soil impacts from the presence of former storage tanks and associated spills, and leaks are present on the Phase II ESA property. Fill material, likely imported during the development stages of the Phase II ESA property is also present. Impacted groundwater is present on the west side of the site, near the location of the former storage tanks, spills, and leaks.

### **Distribution and Migration of Contaminants**

Soil and groundwater impacts are present on the western portion of the Phase II ESA property.

### **Discharge of Contaminants**

The discharge of contaminants is expected to be related to placement of poor-quality fill or leaks and spills associated with former on-site storage tanks. The exact causes and locations of contaminant discharges are unknown.

### **Climatic and Meteorological Conditions**

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

### **Potential for Vapour Intrusion**

As the property is currently vacant and unused, vapour intrusion is not considered to pose a significant environmental risk to the current use of the Phase II ESA property. Any redevelopment of the site should be accompanied by a remediation program, mitigating the risk of vapour intrusion.

## **6.0 CONCLUSIONS**

### **Assessment**

A Phase II ESA was conducted for 861 Clyde Avenue, in the City of Ottawa, Ontario. The purpose of the Phase II ESA was to address the APECs that were identified during the Phase I ESA. The subsurface investigation consisted of drilling 13 boreholes, all of which were instrumented with groundwater monitoring wells.

Based on the historical soil samples and the analytical test results obtained as part of the Phase II ESA, impacted soil is present on the western portion of the Phase II ESA property. The impacted soil is generally expected to be contained to areas not previously remediated, mostly beneath the current building footprint. Any soil impacts encountered as part of the Phase II ESA are expected to extend from beneath the pavement structure to the bedrock surface.

Groundwater samples recovered from the monitoring wells installed in the western portion of the Phase II ESA property were observed to be impacted with benzene. These groundwater results are consistent with the groundwater results previously identified by others as part of the historical investigative work on the site. The chloroform results are considered to be related to the use of municipal groundwater during the coring process. The chloroform concentrations are not considered to exceed the applicable standards.

### **Conclusion**

Based on the findings of the Phase II ESA, impacted soil and groundwater remain present on site. A soil and groundwater remedial action plan will be prepared and implemented in accordance with O.Reg.153/04 prior to the filing of a Record of Site Condition, required for the proposed residential development.

The impacted soil and groundwater are not considered to impact the current use of the Phase II ESA property. As such, remedial actions will be designed and implemented once redevelopment plans have been finalized.

## 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 DOODH Milk Ltd. Notification from DOODH Milk Ltd and Paterson Group will be required prior to the release of this report to any other party.

### **Paterson Group Inc.**



Karyn Munch, P.Eng. QP<sub>ESA</sub>



Michael Beaudoin, P.Eng., QP<sub>ESA</sub>



### **Report Distribution:**

- DOODH Milk Ltd.
- Paterson Group

# **FIGURES**

## **Figure 1 - Key Plan**

**Drawing PE4936-3 – Test Hole Location Plan**

**Drawing PE4936-4 – Analytical Testing Plan – Soil**

**Drawing PE4936-4A – Cross-Section A-A' – Soil**

**Drawing PE4936-4B – Cross-Section B-B' – Soil**

**Drawing PE4936-5 – Analytical Testing Plan – Groundwater**

**Drawing PE4936-5A – Cross-Section A-A' – Groundwater**

**Drawing PE4936-5B – Cross-Section B-B' – Groundwater**



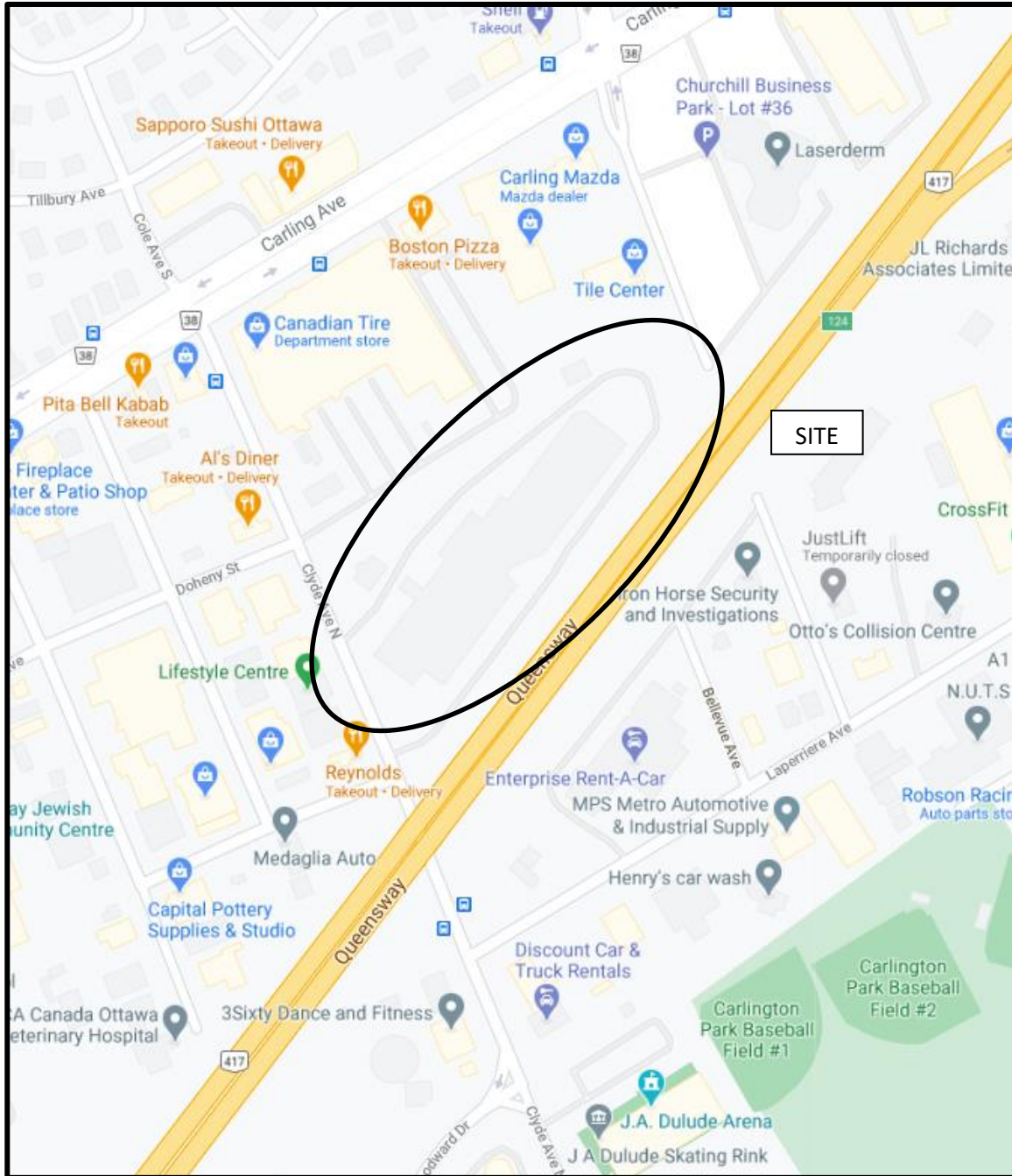
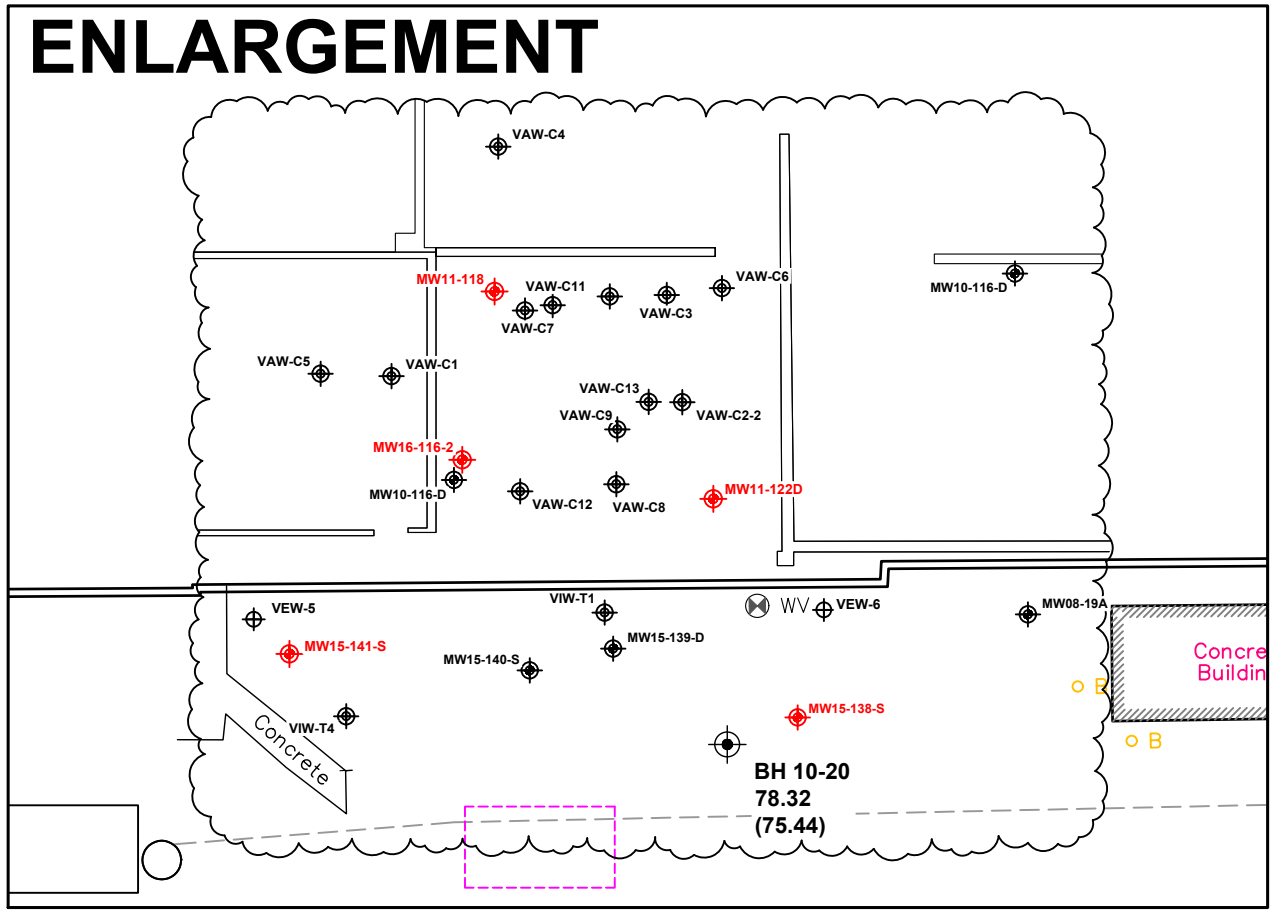
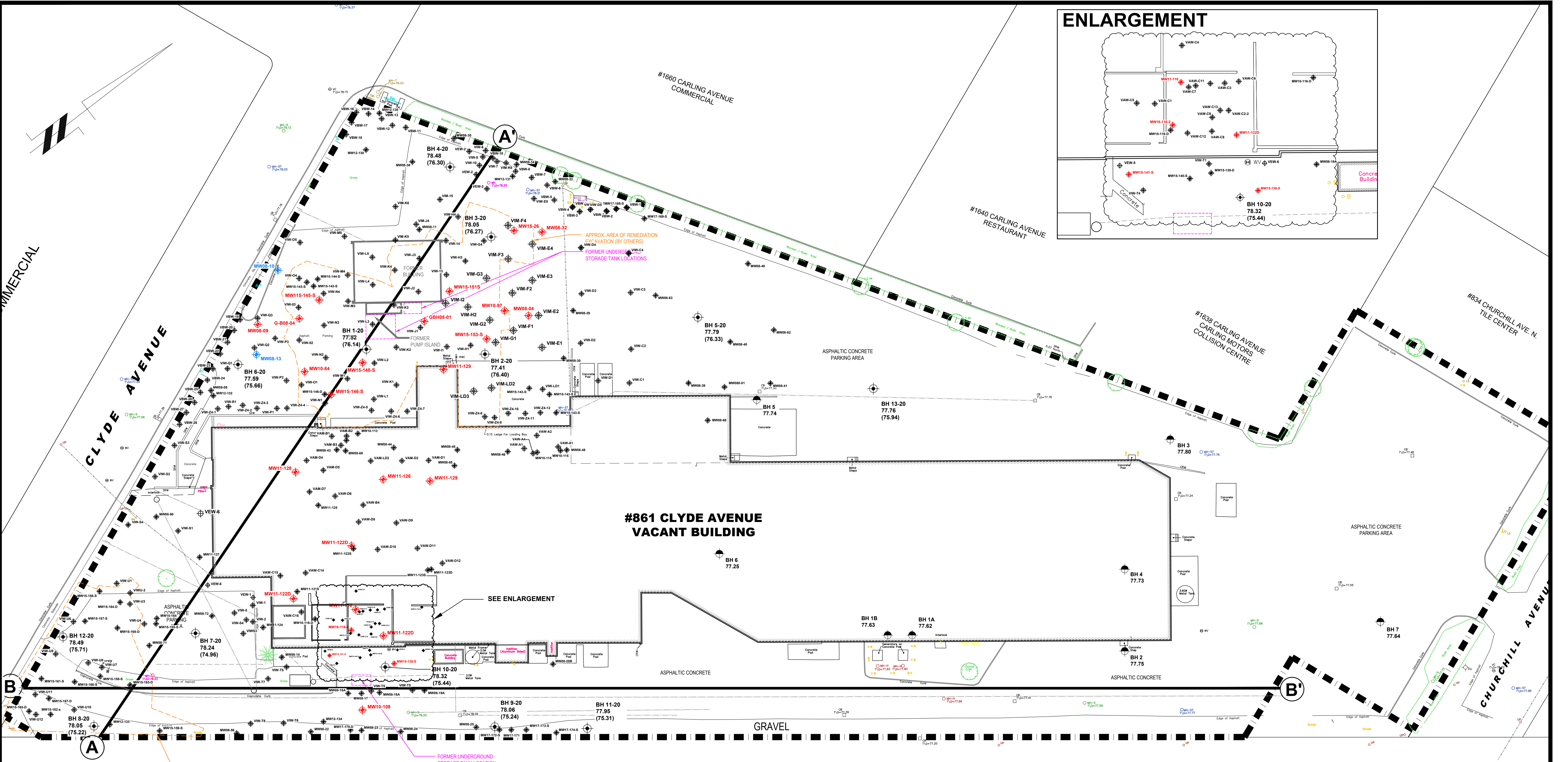


FIGURE 1  
KEY PLAN





- LEGEND:
- BOREHOLE WITH MONITORING WELL LOCATION (CURRENT INVESTIGATION)
  - BOREHOLE LOCATION (PATERSON GROUP REPORT G8545-1, MARCH 2002)
  - SAMPLED MONITORING WELL BY OTHERS LOCATION
  - INJECTION WELL BY OTHERS LOCATION
  - EXTRACTION WELL BY OTHERS LOCATION
  - MONITORING WELL SAMPLED, NO EXCEEDANCE
  - MONITORING WELL SAMPLED, WITH EXCEEDANCE
  - GROUND SURFACE ELEVATION (m)
  - BEDROCK SURFACE ELEVATION (m)
  - GROUNDWATER SURFACE ELEVATION (m)
  - TBM - FINISHED FLOOR LEVEL AS PROVIDED BY LIFF AND TOLOT ARCHITECTS. GEODETIC ELEVATION = 76.40 m
- SCALE: 1:500

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NO.	REVISIONS	DATE	INITIAL
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CLARIDGE HOMES  
PHASE II - ENVIRONMENTAL SITE ASSESSMENT  
861 CLYDE AVENUE  
OTTAWA, ONTARIO

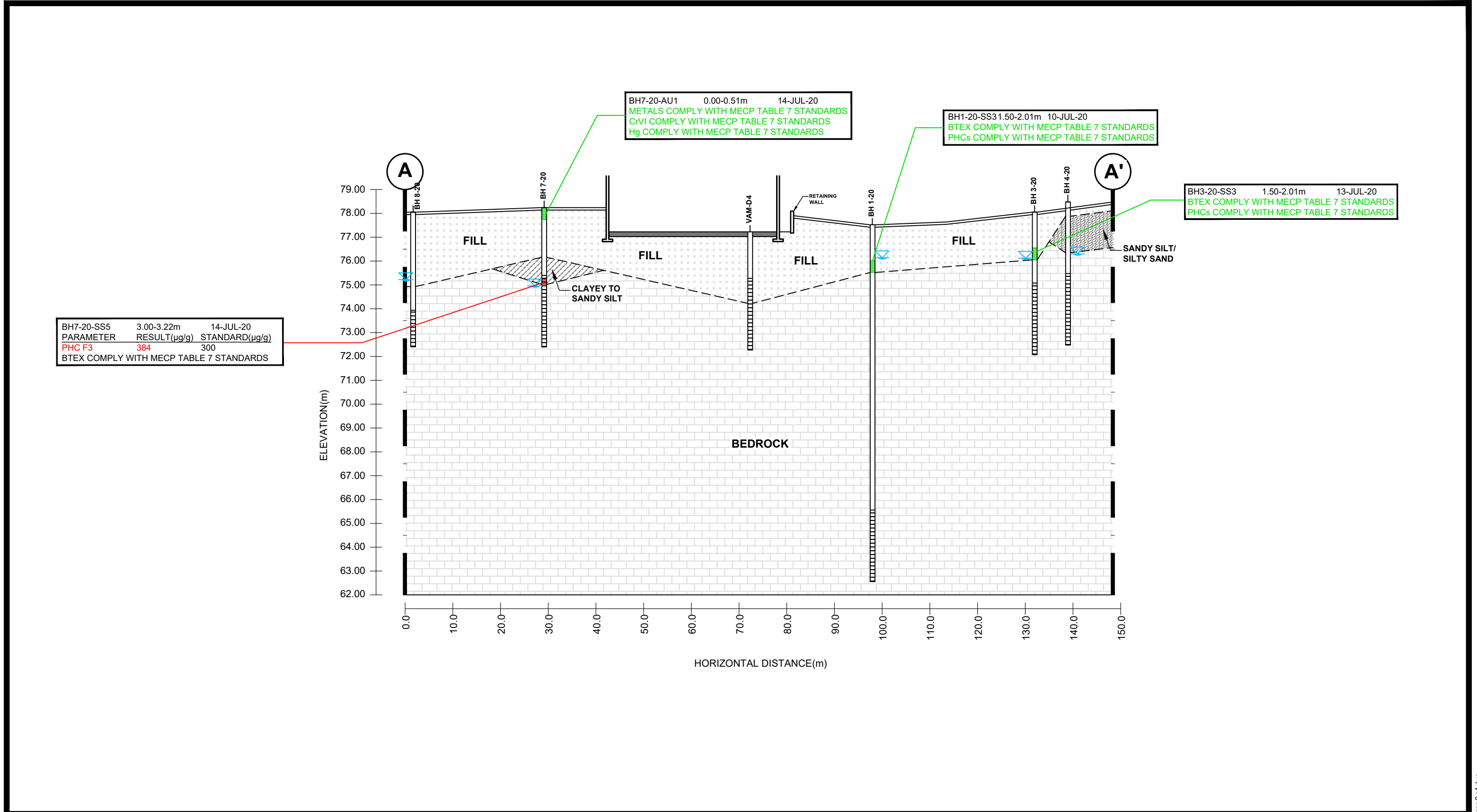
TEST HOLE LOCATION PLAN

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	Checked by: MB	
	Approved by: MSD	
	Date: 09/2020	Revision No.:

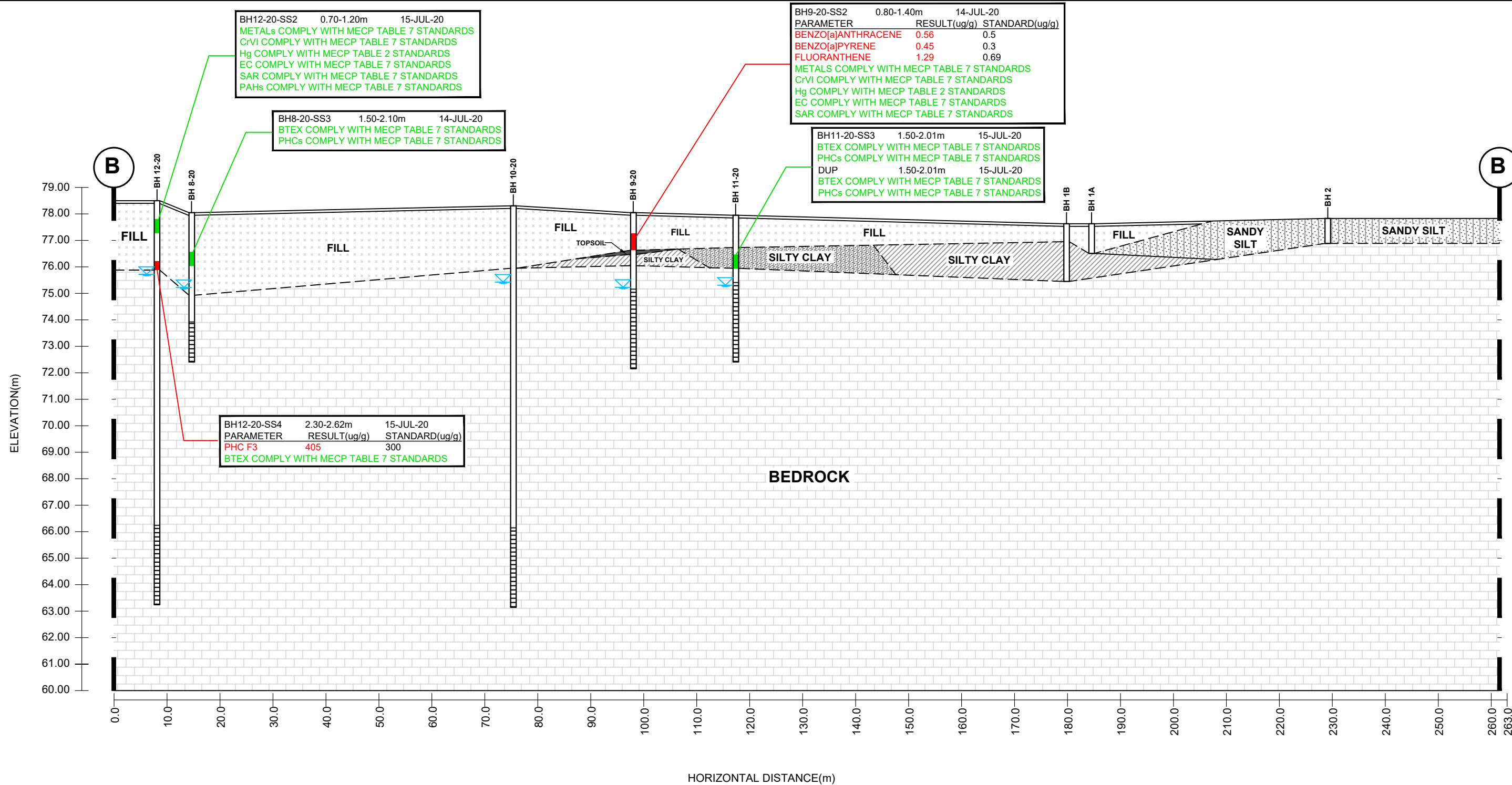








<div><div>patersongroup</div><div>consulting engineers</div><div>154 Colonnade Road South Ottawa, Ontario K2E 7J5 Tel: (613) 226-7381 Fax: (613) 226-6344</div></div>					<div>CLARIDGE HOMES PHASE II - ENVIRONMENTAL SITE ASSESSMENT 861 CLYDE AVENUE OTTAWA, ONTARIO</div> <div>Title: CROSS SECTION A-A' - SOIL</div>	Scale: AS SHOWN	Date: 11/2020
						Drawn by: RCG	Report No.: PE4936-2
						Checked by: MB	PE4936-4A
						Approved by: MSD	
	0						Revision No.:
NO.	REVISIONS	DATE	INITIAL				



SOIL RESULTS COMPLY WITH MECP TABLE 7 STANDARDS

SOIL RESULTS EXCEEDS MECP TABLE 7 STANDARDS

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OTTAWA,  
Title:

ONTARIO

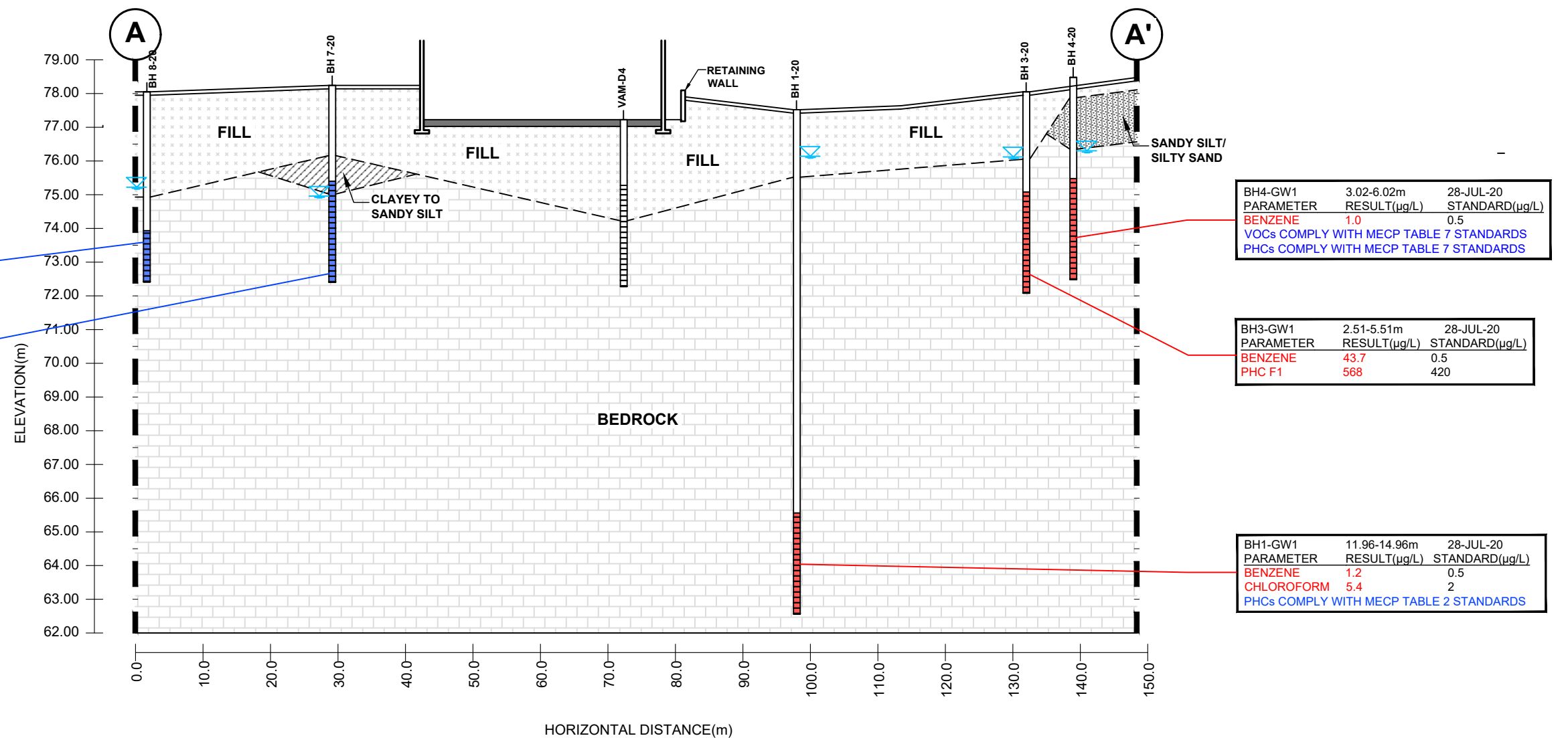
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Drawn by:	RCG	Report No.:	PE4936-2
Checked by:	MB	<b>PE4936-4B</b>	Revision No.:
Approved by:	MSD		









GROUNDWATER RESULTS COMPLY WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULTS EXCEEDS MECP TABLE 7 STANDARDS

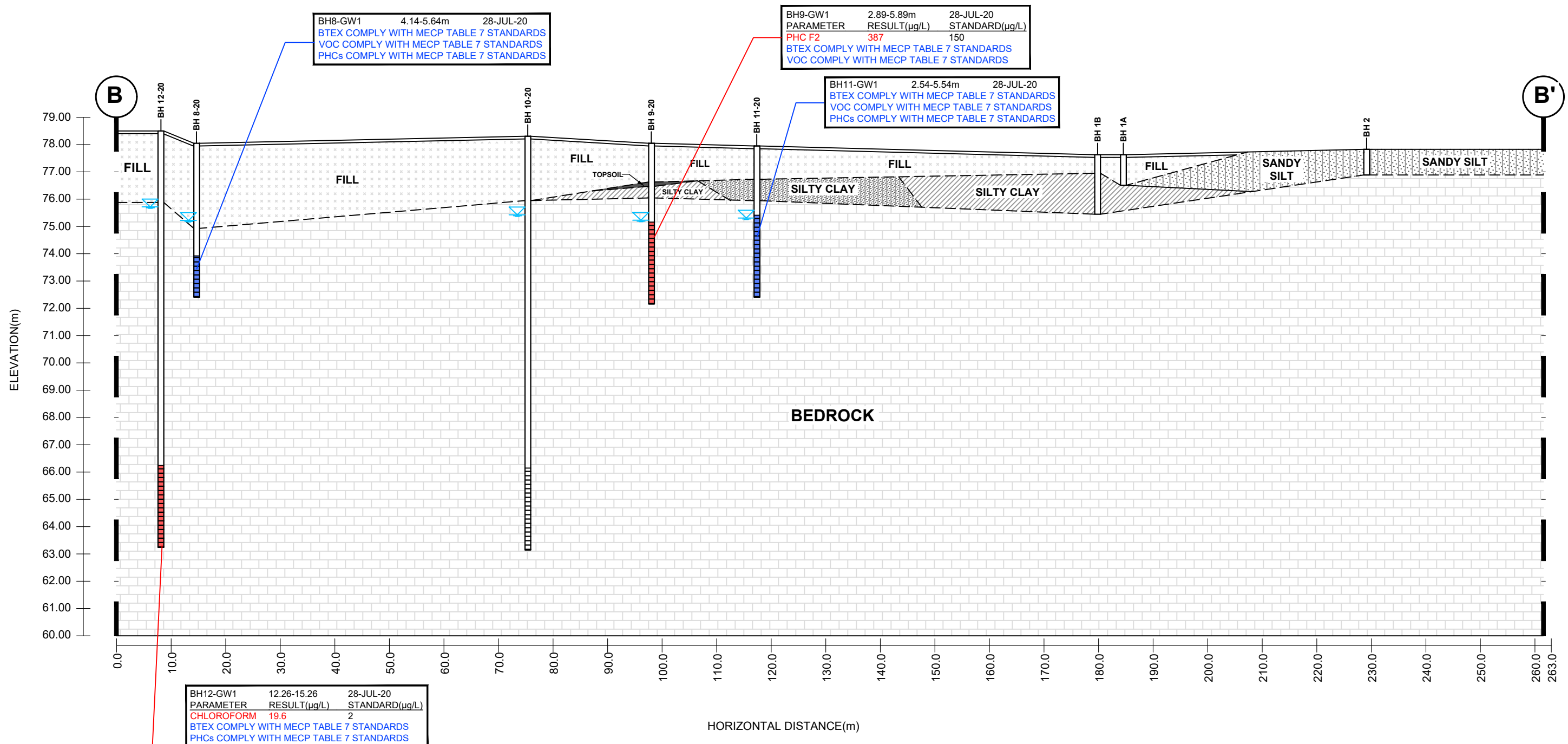
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CLARIDGE HOMES PHASE II - ENVIRONMENTAL SITE ASSESSMENT 861 CLYDE AVENUE	
OTTAWA, Title:	ONTARIO
CROSS SECTION A-A' - GROUNDWATER	

Scale:	AS SHOWN	Date:	11/2020
Drawn by:	RCG	Report No.:	PE4936-2
Checked by:	MB	PE4936-5A	
Approved by:	MSD		
		Revision No.:	



GROUNDWATER RESULTS COMPLY WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULTS EXCEEDS MECP TABLE 7 STANDARDS

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CLARIDGE HOMES PHASE II - ENVIRONMENTAL SITE ASSESSMENT 861 CLYDE AVENUE	
OTTAWA, Title:	ONTARIO
CROSS SECTION B-B' - GROUNDWATER	

Scale:	AS SHOWN	Date:	11/2020
Drawn by:	RCG	Report No.:	PE4936-2
Checked by:	MB	PE4936-5B	
Approved by:	MSD		
		Revision No.:	

# **APPENDIX 1**

**SAMPLING AND ANALYSIS PLAN**

**SOIL PROFILE AND TEST DATA SHEETS**

**SYMBOLS AND TERMS**

**ANALYTICAL TEST RESULTS**

**LABORATORY CERTIFICATES OF ANALYSIS**



DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE July 10, 2020

FILE NO.

PE4936

HOLE NO.

BH 1-20

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
<b>GROUND SURFACE</b>								20	40	60	80	
Asphaltic concrete	0.10	AU	1			0	77.52					
<b>FILL:</b> Brown silty sand with crushed stone		SS	2	79	91	1	76.52					
- with gravel by 0.5m depth	2.01	SS	3	56	50+	2	75.52					
<b>BEDROCK:</b> Good to excellent quality, grey limestone interbedded with shale		RC	1	93	81	3	74.52					
		RC	2	100	81	4	73.52					
		RC	3	100	98	5	72.52					
		RC	4	100	98	6	71.52					
		RC	5	100	98	7	70.52					
		RC	6	100	100	8	69.52					
		RC	7	100	100	9	68.52					
		RC	8	100	100	10	67.52					
		RC	9	100	96	11	66.52					
						12	65.52					
						13	64.52					
						14	63.52					
End of Borehole	14.96											
(GWL @ 1.38m - July 28, 2020)												
								100	200	300	400	500
								<b>RKI Eagle Rdg. (ppm)</b>				
								▲ Full Gas Resp. △ Methane Elim.				

**DATUM**      Geodetic

REMARKS

**BORINGS BY** CME-55 Low Clearance Drill

**DATE** July 10, 2020

FILE NO.

**PE4936**

HOLE NO.

**BH 2-20**

[illegible]

DATUM	Geodetic
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REMARKS

**BORINGS BY** CME-55 Low Clearance Drill

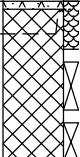
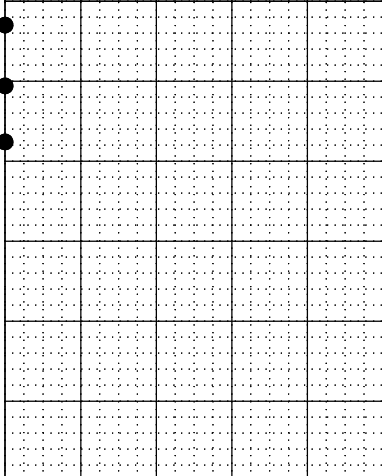
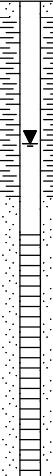

**DATE** July 13, 2020

FILE NO.

**PE4936**

HOLE NO.

**BH 3-20**

SOIL DESCRIPTION		STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
			TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)  ○ Lower Explosive Limit %				
								20	40	60	80		
GROUND SURFACE													
Asphaltic concrete	0.10		AU	1			0	78.05					
FILL: Brown silty sand with crushed stone	SS		2	83	47	1	77.05						
	SS		3	74	35	2	76.05						
BEDROCK: Good to excellent quality, grey limestone interbedded with shale	2.01		RC	1	100	84	3	75.05					
			RC	2	100	100	4	74.05					
			RC	3	100	98	5	73.05					
End of Borehole	5.97												
(GWL @ 1.78m - July 28, 2020)													

100200300400500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

DATUM	Geodetic
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REMARKS

**BORINGS BY** CME-55 Low Clearance Drill

**DATE** July 13, 2020

FILE NO.

**PE4936**

HOLE NO.

**BH 4-20**

SOIL DESCRIPTION		STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector					
			TYPE	NUMBER	% RECOVERY	N VALUE or RQD			<input type="radio"/> Volatile Organic Rdg. (ppm) <input type="radio"/> Lower Explosive Limit % 20       40       60       80					
<b>GROUND SURFACE</b>														
Asphaltic concrete	0.08	[Pattern]	AU	1			0	78.48	●					
FILL: Brown silty sand with crushed stone	0.60	[Pattern]												
Loose, brown SANDY SILT	1.22	[Pattern]	SS	2	46	8	1	77.48	●					
Loose, brown SILTY SAND - GRAVEL	2.13	[Pattern]	RC	3	100	26								
		[Pattern]	RC	1	100	90	2	76.48	●					
BEDROCK: Poor to excellent quality, grey limestone interbedded with shale		[Pattern]												
		[Pattern]	RC	2	100	76	3	75.48						
		[Pattern]												
		[Pattern]	RC	3	97	97	4	74.48						
		[Pattern]												
		[Pattern]												
		[Pattern]												
End of Borehole	6.02	[Pattern]					5	73.48						
(GWL @ 2.18m - July 28, 2020)							6	72.48						

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE July 13, 2020

FILE NO.

PE4936

HOLE NO.

BH 5-20

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
<b>GROUND SURFACE</b>								20	40	60	80	
Asphaltic concrete	0.08	AU	1			0	77.79					
FILL: Brown silty sand with crushed stone	0.59	SS	2	50	8	1	76.79					
Loose, light brown <b>SANDY SILT</b>	1.88					2	75.79					
		RC	1	100	68	3	74.79					
		RC	2	100	95	4	73.79					
		RC	3	100	90	5	72.79					
		RC	4	100	100	6	71.79					
		RC	5	100	100	7	70.79					
		RC	6	100	98	8	69.79					
		RC	7	100	100	9	68.79					
		RC	8	100	100	10	67.79					
		RC	9	100	78	11	66.79					
						12	65.79					
						13	64.79					
						14	63.79					
						15	62.79					
End of Borehole	15.24											
(GWL @ 1.46m - July 28, 2020)												
								100	200	300	400	500
								RKI Eagle Rdg. (ppm)				
								▲ Full Gas Resp. △ Methane Elim.				

**BEDROCK:** Fair to excellent quality, grey limestone interbedded with shale

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE July 14, 2020

FILE NO.

PE4936

HOLE NO.

BH 6-20

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %				
GROUND SURFACE								20	40	60	80		
Asphaltic concrete	0.10		AU	1		0	77.59	●					
FILL: Brown silty sand with crushed stone	0.59		SS	2	58	7	1	76.59	●				
FILL: Brown silty sand with gravel			SS	3	62	15	2	75.59	●				
	2.31		SS	4	100	50+			●				
BEDROCK: Very poor to excellent quality, grey limestone interbedded with shale		RC	1	100	14	3	74.59						
		RC	2	100	100	4	73.59						
		RC	3	100	92	5	72.59						
End of Borehole	6.02					6	71.59						
(GWL @ 1.93m - July 28, 2020)													
</													

DATUM	Geodetic
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REMARKS

**BORINGS BY** CME-55 Low Clearance Drill

**DATE** July 14, 2020

FILE NO.

**PE4936**

HOLE NO.

**BH 7-20**

[illegible]

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

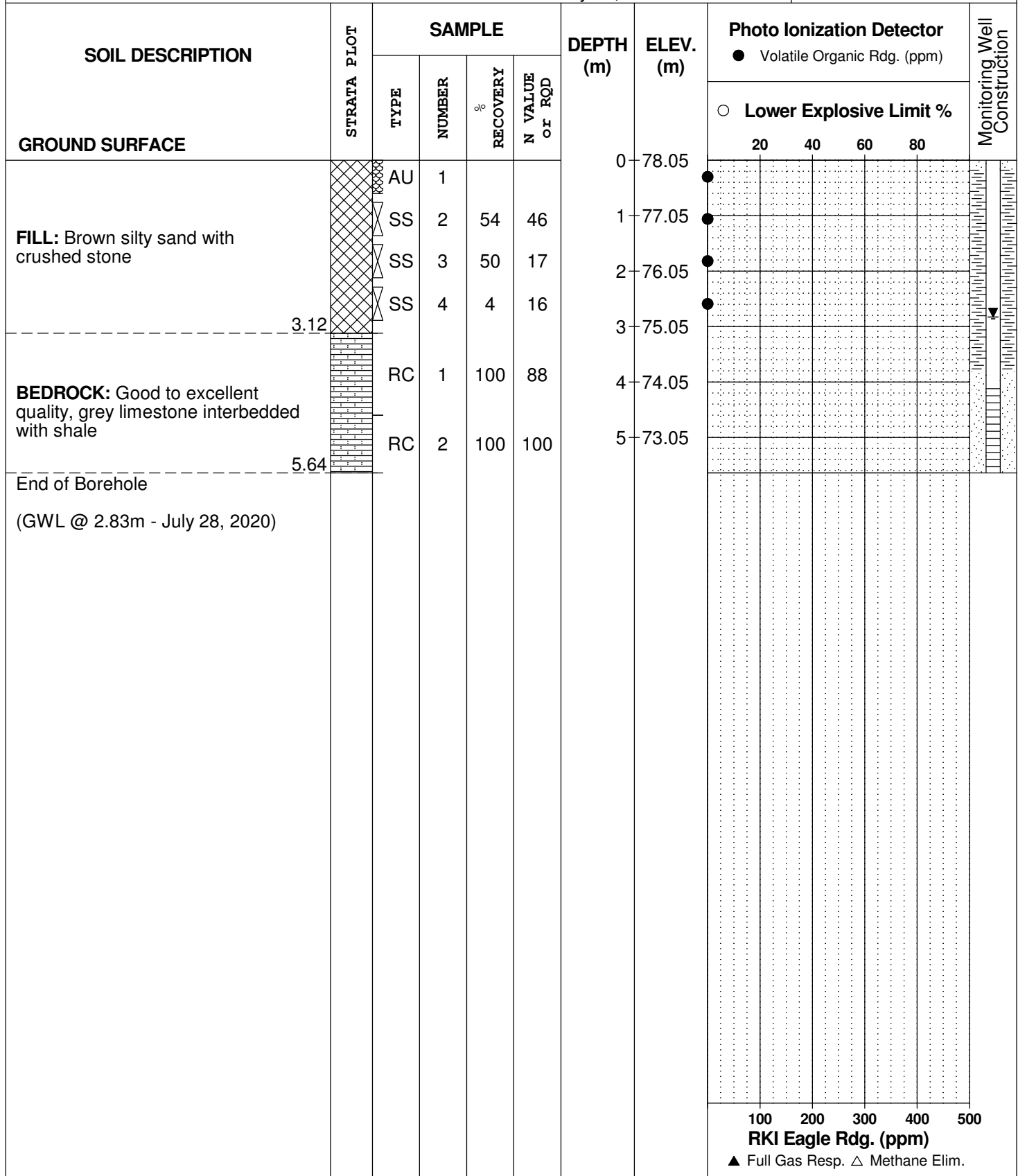
DATE July 14, 2020

FILE NO.

PE4936

HOLE NO.

BH 8-20





SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)	○ Lower Explosive Limit %			
GROUND SURFACE								20	40	60	80	
Asphaltic concrete	0.08	AU	1			0	78.06	●				
FILL: Brown silty sand with crushed stone, some gravel	1.42	SS	2	50	14	1	77.06	●				
TOPSOIL	1.58	SS	3	100	50+			●				
Compact, brown CLAYEY SILT	2.01					2	76.06					
		RC	1	100	70	3	75.06					
		RC	2	100	93	4	74.06					
BEDROCK: Fair to excellent quality, grey limestone interbedded with shale		RC	3	100	92	5	73.06					
End of Borehole	5.89											
(GWL @ 2.82m - July 28, 2020)												

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE July 15, 2020

FILE NO.

PE4936

HOLE NO.

BH10-20

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			● Volatile Organic Rdg. (ppm)					
								○ Lower Explosive Limit %					
GROUND SURFACE								20	40	60	80		
Asphaltic concrete	0.10	AU	1			0	78.32	●					
FILL: Brown silty sand with crushed stone, trace cobbles		SS	2		48	1	77.32	●					
		SS	3		13	2	76.32	●					
	2.36												
BEDROCK: Good to excellent quality, grey limestone interbedded with shale		RC	1	100	76	3	75.32						▼
		RC	2	100	98	4	74.32						
		RC	3	100	92	5	73.32						
						6	72.32						
		RC	4	100	95	7	71.32						
		RC	5	100	100	8	70.32						
						9	69.32						
		RC	6	100	94	10	68.32						
						11	67.32						
		RC	7	100	100	12	66.32						
						13	65.32						
		RC	8	100	100	14	64.32						
		RC	9	100	100	15	63.32						
End of Borehole	15.16												
(GWL @ 2.88m - July 28, 2020)													
								100	200	300	400	500	
								RKI Eagle Rdg. (ppm)					
								▲ Full Gas Resp. △ Methane Elim.					

[illegible]

## SOIL PROFILE AND TEST DATA

FILE NO. **PE4936**

HOLE NO. **BH12-20**

**DATE** July 15, 2020

[illegible]

DATUM	Geodetic
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REMARKS

**BORINGS BY** CME-55 Low Clearance Drill












**DATE** July 29, 2020

FILE NO.

**PE4936**

HOLE NO.

**BH13-20**

SOIL DESCRIPTION		STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Photo Ionization Detector				Monitoring Well Construction	
			TYPE	NUMBER	RECOVERY %	N VALUE or RQD			● Volatile Organic Rdg. (ppm)					
○ Lower Explosive Limit %							20	40	60	80				
GROUND SURFACE														
Asphaltic concrete	0.13		AU	1			0	77.76						
FILL: Brown silty sand with crushed stone	0.60		SS	2	71	12	1	76.76						
FILL: Dark brown silty sand with gravel, trace cobbles	1.52		SS	3		50+								
Dense, brown SILTY SAND, some weathered rock	1.73		RC	1	100	52	2	75.76						
			RC				3	74.76						
BEDROCK: Fair to excellent quality, grey limestone interbedded with shale			RC	2	100	90	4	73.76						
			RC	3	100	100	5	72.76						
End of Borehole	5.43													
(GWL @ 1.82m - August 5, 2020)														

# 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 strength of cohesionless soils is the relative density, 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.

Relative Density	'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 vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

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 is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

### **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 NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

<b>RQD %</b>	<b>ROCK QUALITY</b>
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
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

## SYMBOLS AND TERMS (continued)

### GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture 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 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 = $(D_{30})^2 / (D_{10} \times D_{60})$
Cu	-	Uniformity coefficient = $D_{60} / D_{10}$

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		Overconsolidation 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)

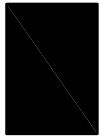
### PERMEABILITY TEST

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.
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## SYMBOLS AND TERMS (continued)

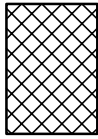
### STRATA PLOT



Topsoil



Asphalt



Fill



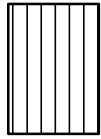
Peat



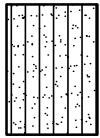
Sand



Silty Sand



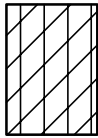
Silt



Sandy Silt



Clay



Silty Clay



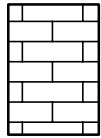
Clayey Silty Sand



Glacial Till



Shale



Bedrock

### MONITORING WELL AND PIEZOMETER CONSTRUCTION

#### MONITORING WELL CONSTRUCTION



#### PIEZOMETER CONSTRUCTION



Parameter	Units	MDL	Regulation	BH2-20-SS2	BH6-20-SS2	BH7-20-AU1	BH7-20-SS5	BH9-20-SS2	BH12-20-SS2
Sample Depth (m)			MECP Table 7 Residential Coarse	0.60-1.20	0.75-1.25	0.00-0.51	3.00-3.22	0.80-1.40	0.70-1.20
Sample Date				10-Jul-20	14-Jul-20	14-Jul-20	14-Jul-20	14-Jul-20	15-Jul-20
Metals									
Chromium (VI)	ug/g dry	0.2	8 ug/g dry	ND (0.2)	ND (0.2)	ND (0.2)	N/A	ND (0.2)	ND (0.2)
Mercury	ug/g dry	0.1	0.27 ug/g dry	ND (0.1)	ND (0.1)	ND (0.1)	N/A	ND (0.1)	ND (0.1)
Antimony	ug/g dry	1.0	7.5 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Arsenic	ug/g dry	1.0	18 ug/g dry	2.8	3.8	3.3	N/A	4.8	2.8
Barium	ug/g dry	1.0	390 ug/g dry	55.8	53.6	108	N/A	69.9	79.3
Beryllium	ug/g dry	1.0	4 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)
Boron	ug/g dry	1.0	120 ug/g dry	6.6	ND (5.0)	ND (5.0)	N/A	ND (5.0)	5.1
Cadmium	ug/g dry	0.5	1.2 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	N/A	ND (0.5)	ND (0.5)
Chromium	ug/g dry	1.0	160 ug/g dry	11.7	20.3	26.2	N/A	20.0	16.3
Cobalt	ug/g dry	1.0	22 ug/g dry	5.2	4.8	6.7	N/A	5.1	5.8
Copper	ug/g dry	1.0	140 ug/g dry	15.5	12.1	18.1	N/A	12.2	13.8
Lead	ug/g dry	1.0	120 ug/g dry	4.2	9.0	16.1	N/A	11.9	13.3
Molybdenum	ug/g dry	1.0	6.9 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Nickel	ug/g dry	1.0	100 ug/g dry	9.4	10.1	14.6	N/A	11.0	10.9
Selenium	ug/g dry	1.0	2.4 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Silver	ug/g dry	0.5	20 ug/g dry	ND (0.3)	ND (0.3)	ND (0.3)	N/A	ND (0.3)	ND (0.3)
Thallium	ug/g dry	1.0	1 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Uranium	ug/g dry	1.0	23 ug/g dry	ND (1.0)	1.0	ND (1.0)	N/A	ND (1.0)	ND (1.0)
Vanadium	ug/g dry	1.0	86 ug/g dry	15.4	30.2	35.5	N/A	26.9	23.1
Zinc	ug/g dry	1.0	340 ug/g dry	26.3	31.8	43.6	N/A	38.4	28.3
General Inorganics									
SAR	N/A	0.01	5 N/A	N/A	2.93	N/A	N/A	3.56	0.60
Conductivity	uS/cm	5	0.7 mS/cm (700 uS/cm)	N/A	534	N/A	N/A	529	200
pH	pH Units	0.05		7.93	N/A	N/A	7.61	N/A	N/A

2

Sample exceeds MECP Table 7 Residential Coarse Grained Standard

ND (0.5)

No concentrations identified above the MDL

NA

Parameter not analysed

Parameter	Units	MDL	Regulation	BH1-GW1	BH2-GW1	BH3-GW1	BH4-GW1	BH5-GW1	BH6-GW1	BH7-GW1	BH8-GW1	BH9-GW1	BH11-GW1	BH12-GW1	BH13-20-GW1
Screen Interval (m)			MECP Table 7	11.96-14.96	2.51-5.51	2.51-5.51	3.02-6.02	12.24-15.24	3.02-6.02	4.34-5.84	4.14-5.64	2.89-5.89	2.54-5.54	12.26-15.26	2.43-5.43
Sample Date			Coarse Grained	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	05-Aug-20
Volatiles															
Acetone	ug/L	5.0	100000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	ug/L	0.5	0.5 ug/L	1.2	4.3	43.7	1.0	2.8	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	ug/L	0.5	67000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	ug/L	0.5	5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	ug/L	0.5	0.89 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	ug/L	0.2	0.2 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	ug/L	0.5	140 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	ug/L	0.5	2 ug/L	5.4	ND (0.5)	ND (0.5)	ND (0.5)	11.4	0.9	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	19.6	ND (0.5)
Dibromochloromethane	ug/L	0.5	65000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	ug/L	1.0	3500 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	ug/L	0.5	150 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	ug/L	0.5	7600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	ug/L	0.5	11 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	ug/L	0.5	0.58 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	17.5	51.6	0.7	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide	ug/L	0.2	0.2 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	ug/L	1.0	5 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone	ug/L	5.0	21000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	ug/L	5.0	5200 ug/L	ND (5.0)	ND (5.0)	64.5	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	ug/L	2.0	15 ug/L	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	ug/L	5.0	26 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	ug/L	0.5	43 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	ug/L	0.5	320 ug/L	0.9	ND (0.5)	0.9	ND (0.5)	1.3	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	ug/L	0.5	23 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	ug/L	1.0	2000 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	14.3	41.7	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	14.3	41.7	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

ND (0.5)

No concentrations identified above the MDL

MDL

Method Detection Limit

NA

Parameter Not Analysed

Parameter	Units	MDL	Regulation	BH6-20-SS2	BH9-20-SS2	BH12-20-SS2
Sample Depth (m)			MECP Table 7 Residential Coarse	0.75-1.25	0.80-1.40	0.70-1.20
Sample Date				14-Jul-20	14-Jul-20	15-Jul-20
Semi-Volatiles						
Acenaphthene	ug/g dry	0.02	7.9 ug/g dry	ND (0.02)	0.04	ND (0.02)
Acenaphthylene	ug/g dry	0.02	0.15 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)
Anthracene	ug/g dry	0.02	0.67 ug/g dry	ND (0.02)	0.41	0.04
Benzo[a]anthracene	ug/g dry	0.02	0.5 ug/g dry	ND (0.02)	0.56	0.05
Benzo[a]pyrene	ug/g dry	0.02	0.3 ug/g dry	ND (0.02)	0.45	0.05
Benzo[b]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	ND (0.02)	0.50	0.06
Benzo[g,h,i]perylene	ug/g dry	0.02	6.6 ug/g dry	ND (0.02)	0.25	0.03
Benzo[k]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	ND (0.02)	0.27	0.03
Chrysene	ug/g dry	0.02	7 ug/g dry	ND (0.02)	0.55	0.05
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1 ug/g dry	ND (0.02)	0.07	ND (0.02)
Fluoranthene	ug/g dry	0.02	0.69 ug/g dry	ND (0.02)	1.29	0.12
Fluorene	ug/g dry	0.02	62 ug/g dry	ND (0.02)	0.08	ND (0.02)
Indeno[1,2,3-cd]pyrene	ug/g dry	0.02	0.38 ug/g dry	ND (0.02)	0.23	0.03
1-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)
2-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)
Methylnaphthalene (1&2)	ug/g dry	0.04	0.99 ug/g dry	ND (0.04)	ND (0.04)	ND (0.04)
Naphthalene	ug/g dry	0.01	0.6 ug/g dry	ND (0.01)	0.01	ND (0.01)
Phenanthrene	ug/g dry	0.02	6.2 ug/g dry	ND (0.02)	0.80	0.10
Pyrene	ug/g dry	0.02	78 ug/g dry	0.02	0.98	0.09

2

ND (0.5)

Sample exceeds MECP Table 7 Residential  
Coarse Grained Standard  
No concentrations identified above the  
MDL

Parameter	Units	MDL	Regulation	BH6-GW1	BH7-GW1	BH11-GW1	BH12-GW1
Screen Interval (m)			MECP Table 7 Coarse Grained	3.02-6.02	4.34-5.84	2.54-5.54	12.26-15.26
Sample Date				28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20
<i>Semi-Volatiles</i>							
Acenaphthene	ug/L	0.05	17 ug/L	0.42	ND (0.05)	ND (0.05)	ND (0.05)
Acenaphthylene	ug/L	0.05	1 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Anthracene	ug/L	0.05	1 ug/L	0.08	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[a]anthracene	ug/L	0.05	1.8 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[a]pyrene	ug/L	0.01	0.81 ug/L	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Benzo[b]fluoranthene	ug/L	0.05	0.75 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Benzo[g,h,i]perylene	ug/L	0.05	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Benzo[k]fluoranthene	ug/L	0.05	0.4 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chrysene	ug/L	0.05	0.7 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibenzo[a,h]anthracene	ug/L	0.05	0.4 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Fluoranthene	ug/L	0.05	44 ug/L	0.06	ND (0.01)	ND (0.01)	0.06
Fluorene	ug/L	0.05	290 ug/L	0.46	ND (0.05)	ND (0.05)	ND (0.05)
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1-Methylnaphthalene	ug/L	0.05	1500 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
2-Methylnaphthalene	ug/L	0.05	1500 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylnaphthalene (1&2)	ug/L	0.071	1500 ug/L	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
Naphthalene	ug/L	0.05	7 ug/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Phenanthrene	ug/L	0.03	380 ug/L	0.18	ND (0.05)	ND (0.05)	0.07
Pyrene	ug/L	0.05	5.7 ug/L	0.11	ND (0.01)	ND (0.01)	0.05

Parameter	Units	MDL	Regulation	BH1-20-SS3	BH3-20-SS3	BH6-20-SS4	BH7-20-SS5	BH8-20-SS3	BH11-20-SS3	DUP	BH12-20-SS4
Sample Depth (m)			MECP Table 7 Residential Coarse	1.50-2.01	1.50-2.01	2.13-2.33	3.00-3.22	1.50-2.10	1.50-2.01	1.50-2.01	2.30-2.62
Sample Date				10-Jul-20	13-Jul-20	14-Jul-20	14-Jul-20	14-Jul-20	15-Jul-20	15-Jul-20	15-Jul-20
<b>Volatiles</b>											
Benzene	ug/g dry	0.02	0.21 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene	ug/g dry	0.05	2.3 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
m/p-Xylene	ug/g dry	0.05		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	ug/g dry	0.05		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	ug/g dry	0.05	3.1 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
<b>Hydrocarbons</b>											
F1 PHCs (C6-C10)	ug/g dry	7	55 ug/g dry	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)
F2 PHCs (C10-C16)	ug/g dry	4	98 ug/g dry	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (40)
F3 PHCs (C16-C34)	ug/g dry	8	300 ug/g dry	177	49	98	384	11	ND (8)	ND (8)	405
F4 PHCs (C34-C50)	ug/g dry	6	2800 ug/g dry	163	64	142	314	15	ND (6)	ND (6)	564
F4G PHCs (gravimetric)	ug/g dry	50	2800 ug/g dry	408	N/A	327	568	N/A	N/A	N/A	1370

2	Sample exceeds MECP Table 7 Residential Coarse Grained Standard
ND (0.5)	No concentrations identified above the MDL
NA	Parameter not analysed

Parameter	Units	MDL	Regulation	BH1-GW1	BH2-GW1	BH3-GW1	BH4-GW1
Sample Depth (m)			MECP Table 7 Residential Coarse	11.96-14.96	2.51-5.51	2.51-5.51	3.02-6.02
Sample Date				28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20
<i>Volatiles</i>							
Benzene	ug/L	0.5	0.5 ug/L	1.2	4.3	43.7	1.0
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	17.5	51.6	0.7
Toluene	ug/L	0.5	320 ug/L	0.9	ND (0.5)	0.9	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	14.3	41.7	ND (0.5)
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	14.3	41.7	ND (0.5)
<i>Hydrocarbons</i>							
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND (25)	845	568	ND (25)
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	ND (100)	ND (100)	ND (100)	ND (100)
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit

Parameter	Units	MDL	Regulation	BH5-GW1	BH6-GW1	BH7-GW1	BH8-GW1
Sample Depth (m)			MECP Table 7 Residential Coarse	12.24-15.24	3.02-6.02	4.34-5.84	4.14-5.64
Sample Date				28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20
Volatiles							
Benzene	ug/L	0.5	0.5 ug/L	2.8	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	ug/L	0.5	320 ug/L	1.3	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Hydrocarbons							
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND (25)	ND (25)	ND (25)	ND (25)
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	ND (100)	244	ND (100)	ND (100)
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	ND (100)	292	ND (100)	364
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit



Parameter	Units	MDL	Regulation	BH9-GW1	BH11-GW1	BH12-GW1	BH13-20-GW1
Sample Depth (m)			MECP Table 7 Residential Coarse	2.89-5.89	2.54-5.54	12.26-15.26	2.43-5.43
Sample Date				28-Jul-20	28-Jul-20	28-Jul-20	05-Aug-20
<i>Volatiles</i>							
Benzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	ug/L	0.5	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
<i>Hydrocarbons</i>							
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND (25)	ND (25)	ND (25)	ND (25)
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	387	ND (100)	ND (100)	ND (100)
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	334	212	281	ND (100)
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND (100)	ND (100)	113	ND (100)

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit

## Certificate of Analysis

**Paterson Group Consulting Engineers**

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

Client PO: 30540  
Project: PE4936  
Custody: 128049

Report Date: 10-Aug-2020  
Order Date: 7-Aug-2020

**Order #: 2032517**

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

**Paracel ID**

2032517-01

**Client ID**

BH13-20-GW1

Approved By:



Dale Robertson, BSc  
Laboratory Director

Certificate of Analysis

Report Date: 10-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 7-Aug-2020

Client PO: 30540

Project Description: PE4936

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	7-Aug-20	8-Aug-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	10-Aug-20	10-Aug-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	7-Aug-20	8-Aug-20

Certificate of Analysis

Report Date: 10-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 7-Aug-2020

Client PO: 30540

Project Description: PE4936

Client ID:	BH13-20-GW1	-	-	-
Sample Date:	05-Aug-20 12:00	-	-	-
Sample ID:	2032517-01	-	-	-
MDL/Units	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	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethane, 1,2-)	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	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 10-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 7-Aug-2020

Client PO: 30540

Project Description: PE4936

	Client ID:	BH13-20-GW1	-	-	-
	Sample Date:	05-Aug-20 12:00	-	-	-
	Sample ID:	2032517-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	105%	-	-	-
Dibromofluoromethane	Surrogate	97.2%	-	-	-
Toluene-d8	Surrogate	101%	-	-	-

#### Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis

Report Date: 10-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 7-Aug-2020

Client PO: 30540

Project Description: PE4936

## Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
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						
<b>Volatiles</b>									
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	86.2		ug/L		108	50-140			
Surrogate: Dibromofluoromethane	76.3		ug/L		95.4	50-140			
Surrogate: Toluene-d8	82.4		ug/L		103	50-140			

Certificate of Analysis

Report Date: 10-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 7-Aug-2020

Client PO: 30540

Project Description: PE4936

**Method Quality Control: Duplicate**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
<b>Volatiles</b>									
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	83.8		ug/L		105	50-140			
Surrogate: Dibromofluoromethane	76.1		ug/L		95.1	50-140			
Surrogate: Toluene-d8	82.3		ug/L		103	50-140			

Certificate of Analysis

Report Date: 10-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 7-Aug-2020

Client PO: 30540

Project Description: PE4936

## Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	1700	25	ug/L	ND	85.0	68-117			
F2 PHCs (C10-C16)	1500	100	ug/L	ND	93.7	60-140			
F3 PHCs (C16-C34)	4010	100	ug/L	ND	102	60-140			
F4 PHCs (C34-C50)	2760	100	ug/L	ND	111	60-140			
<b>Volatiles</b>									
Acetone	79.5	5.0	ug/L	ND	79.5	50-140			
Benzene	38.7	0.5	ug/L	ND	96.6	60-130			
Bromodichloromethane	32.3	0.5	ug/L	ND	80.8	60-130			
Bromoform	49.6	0.5	ug/L	ND	124	60-130			
Bromomethane	33.7	0.5	ug/L	ND	84.4	50-140			
Carbon Tetrachloride	27.0	0.2	ug/L	ND	67.6	60-130			
Chlorobenzene	38.5	0.5	ug/L	ND	96.3	60-130			
Chloroform	34.4	0.5	ug/L	ND	86.0	60-130			
Dibromochloromethane	37.2	0.5	ug/L	ND	92.9	60-130			
Dichlorodifluoromethane	38.6	1.0	ug/L	ND	96.4	50-140			
1,2-Dichlorobenzene	43.8	0.5	ug/L	ND	110	60-130			
1,3-Dichlorobenzene	42.1	0.5	ug/L	ND	105	60-130			
1,4-Dichlorobenzene	43.1	0.5	ug/L	ND	108	60-130			
1,1-Dichloroethane	32.3	0.5	ug/L	ND	80.7	60-130			
1,2-Dichloroethane	43.2	0.5	ug/L	ND	108	60-130			
1,1-Dichloroethylene	30.2	0.5	ug/L	ND	75.4	60-130			
cis-1,2-Dichloroethylene	36.3	0.5	ug/L	ND	90.8	60-130			
trans-1,2-Dichloroethylene	33.3	0.5	ug/L	ND	83.2	60-130			
1,2-Dichloropropane	39.1	0.5	ug/L	ND	97.8	60-130			
cis-1,3-Dichloropropylene	42.5	0.5	ug/L	ND	106	60-130			
trans-1,3-Dichloropropylene	42.6	0.5	ug/L	ND	107	60-130			
Ethylbenzene	37.8	0.5	ug/L	ND	94.6	60-130			
Ethylene dibromide (dibromoethane, 1,2-	35.3	0.2	ug/L	ND	88.4	60-130			
Hexane	30.2	1.0	ug/L	ND	75.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	99.0	5.0	ug/L	ND	99.0	50-140			
Methyl Isobutyl Ketone	107	5.0	ug/L	ND	107	50-140			
Methyl tert-butyl ether	88.2	2.0	ug/L	ND	88.2	50-140			
Methylene Chloride	32.2	5.0	ug/L	ND	80.4	60-130			
Styrene	39.2	0.5	ug/L	ND	97.9	60-130			
1,1,1,2-Tetrachloroethane	37.8	0.5	ug/L	ND	94.4	60-130			
1,1,1,2,2-Tetrachloroethane	30.7	0.5	ug/L	ND	76.8	60-130			
Tetrachloroethylene	38.3	0.5	ug/L	ND	95.8	60-130			
Toluene	39.4	0.5	ug/L	ND	98.5	60-130			
1,1,1-Trichloroethane	30.3	0.5	ug/L	ND	75.8	60-130			
1,1,2-Trichloroethane	38.2	0.5	ug/L	ND	95.4	60-130			
Trichloroethylene	43.5	0.5	ug/L	ND	109	60-130			
Trichlorofluoromethane	33.4	1.0	ug/L	ND	83.5	60-130			
Vinyl chloride	40.8	0.5	ug/L	ND	102	50-140			
m,p-Xylenes	78.8	0.5	ug/L	ND	98.5	60-130			
o-Xylene	39.9	0.5	ug/L	ND	99.8	60-130			
Surrogate: 4-Bromofluorobenzene	89.1		ug/L		111	50-140			
Surrogate: Dibromofluoromethane	79.4		ug/L		99.2	50-140			
Surrogate: Toluene-d8	79.7		ug/L		99.6	50-140			



Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30540

Report Date: 10-Aug-2020

Order Date: 7-Aug-2020

Project Description: PE4936

**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.



## Certificate of Analysis

**Paterson Group Consulting Engineers**

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

Client PO: 30497  
Project: PE4936  
Custody: 128585,128584

Report Date: 5-Aug-2020  
Order Date: 29-Jul-2020

**Order #: 2031305**

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

Paracel ID	Client ID
2031305-01	BH1-GW1
2031305-02	BH2-GW1
2031305-03	BH3-GW1
2031305-04	BH4-GW1
2031305-05	BH5-GW1
2031305-06	BH6-GW1
2031305-07	BH7-GW1
2031305-08	BH8-GW1
2031305-09	BH9-GW1
2031305-10	BH11-GW1
2031305-11	BH12-GW1
2031305-12	DUP

Approved By:



Dale Robertson, BSc  
Laboratory Director

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	29-Jul-20	30-Jul-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	31-Jul-20	31-Jul-20
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	4-Aug-20	4-Aug-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	29-Jul-20	30-Jul-20

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	BH4-GW1
	Sample Date:	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00
	Sample ID:	2031305-01	2031305-02	2031305-03	2031305-04
	MDL/Units	Water	Water	Water	Water
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	1.2	4.3	43.7	1.0
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	5.4	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	17.5	51.6	0.7
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	64.5	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	0.9	<0.5	0.9	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	MDL/Units	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	BH4-GW1
		Sample Date:	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00
		Sample ID:	2031305-01	2031305-02	2031305-03	2031305-04
			Water	Water	Water	Water
1,1,2-Trichloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L		<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L		<0.5	14.3	41.7	<0.5
o-Xylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L		<0.5	14.3	41.7	<0.5
4-Bromofluorobenzene	Surrogate		105%	103%	103%	106%
Dibromofluoromethane	Surrogate		95.2%	89.4%	87.3%	95.3%
Toluene-d8	Surrogate		102%	101%	101%	102%

#### Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	845	568	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	MDL/Units	Client ID:	BH5-GW1	BH6-GW1	BH7-GW1	BH8-GW1
		Sample Date:	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00
		Sample ID:	2031305-05	2031305-06	2031305-07	2031305-08
			Water	Water	Water	Water
<b>Volatiles</b>						
Acetone	5.0 ug/L		<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L		2.8	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L		<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L		11.4	0.9	<0.5	<0.5
Dibromochloromethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L		<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane, 1	0.2 ug/L		<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L		<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L		<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L		<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L		<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L		<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,1,1,2,2-Tetrachloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L		1.3	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	MDL/Units	Client ID: Sample Date: Sample ID:	BH5-GW1 28-Jul-20 09:00 2031305-05 Water	BH6-GW1 28-Jul-20 09:00 2031305-06 Water	BH7-GW1 28-Jul-20 09:00 2031305-07 Water	BH8-GW1 28-Jul-20 09:00 2031305-08 Water
1,1,1-Trichloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L		<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L		<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate		102%	106%	106%	105%
Dibromofluoromethane	Surrogate		97.4%	95.0%	95.8%	95.0%
Toluene-d8	Surrogate		102%	101%	102%	102%
<b>Hydrocarbons</b>						
F1 PHCs (C6-C10)	25 ug/L		<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L		<100	244	<100	<100
F3 PHCs (C16-C34)	100 ug/L		<100	292	<100	364
F4 PHCs (C34-C50)	100 ug/L		<100	<100	<100	<100
<b>Semi-Volatiles</b>						
Acenaphthene	0.05 ug/L		-	0.42	<0.05	-
Acenaphthylene	0.05 ug/L		-	<0.05	<0.05	-
Anthracene	0.01 ug/L		-	0.08	<0.01	-
Benzo [a] anthracene	0.01 ug/L		-	<0.01	<0.01	-
Benzo [a] pyrene	0.01 ug/L		-	<0.01	<0.01	-
Benzo [b] fluoranthene	0.05 ug/L		-	<0.05	<0.05	-
Benzo [g,h,i] perylene	0.05 ug/L		-	<0.05	<0.05	-
Benzo [k] fluoranthene	0.05 ug/L		-	<0.05	<0.05	-
Chrysene	0.05 ug/L		-	<0.05	<0.05	-
Dibenzo [a,h] anthracene	0.05 ug/L		-	<0.05	<0.05	-
Fluoranthene	0.01 ug/L		-	0.06	<0.01	-
Fluorene	0.05 ug/L		-	0.46	<0.05	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L		-	<0.05	<0.05	-
1-Methylnaphthalene	0.05 ug/L		-	<0.05	<0.05	-
2-Methylnaphthalene	0.05 ug/L		-	<0.05	<0.05	-
Methylnaphthalene (1&2)	0.10 ug/L		-	<0.10	<0.10	-
Naphthalene	0.05 ug/L		-	<0.05	<0.05	-
Phenanthrene	0.05 ug/L		-	0.18	<0.05	-



Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	Client ID:	BH5-GW1	BH6-GW1	BH7-GW1	BH8-GW1
	Sample Date:	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00
	Sample ID:	2031305-05	2031305-06	2031305-07	2031305-08
	MDL/Units	Water	Water	Water	Water
Pyrene	0.01 ug/L	-	0.11	<0.01	-
2-Fluorobiphenyl	Surrogate	-	89.6%	89.4%	-
Terphenyl-d14	Surrogate	-	95.9%	106%	-

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	Client ID: BH9-GW1    BH11-GW1    BH12-GW1    DUP				
	Sample Date: 28-Jul-20 09:00    28-Jul-20 09:00    28-Jul-20 09:00    28-Jul-20 09:00				
	Sample ID: 2031305-09    2031305-10    2031305-11    2031305-12				
	MDL/Units	Water	Water	Water	Water
<b>Volatiles</b>					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	19.6	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane, 1	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	Client ID: Sample Date: Sample ID:	BH9-GW1 28-Jul-20 09:00 2031305-09 Water	BH11-GW1 28-Jul-20 09:00 2031305-10 Water	BH12-GW1 28-Jul-20 09:00 2031305-11 Water	DUP 28-Jul-20 09:00 2031305-12 Water
	MDL/Units				
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	106%	105%	103%	107%
Dibromofluoromethane	Surrogate	96.5%	94.8%	96.6%	96.0%
Toluene-d8	Surrogate	102%	101%	102%	102%

**Hydrocarbons**

F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	387	<100	<100	266
F3 PHCs (C16-C34)	100 ug/L	334	212	281	222
F4 PHCs (C34-C50)	100 ug/L	<100	<100	113	<100

**Semi-Volatiles**

Acenaphthene	0.05 ug/L	-	<0.05	<0.05	-
Acenaphthylene	0.05 ug/L	-	<0.05	<0.05	-
Anthracene	0.01 ug/L	-	<0.01	<0.01	-
Benzo [a] anthracene	0.01 ug/L	-	<0.01	<0.01	-
Benzo [a] pyrene	0.01 ug/L	-	<0.01	<0.01	-
Benzo [b] fluoranthene	0.05 ug/L	-	<0.05	<0.05	-
Benzo [g,h,i] perylene	0.05 ug/L	-	<0.05	<0.05	-
Benzo [k] fluoranthene	0.05 ug/L	-	<0.05	<0.05	-
Chrysene	0.05 ug/L	-	<0.05	<0.05	-
Dibenzo [a,h] anthracene	0.05 ug/L	-	<0.05	<0.05	-
Fluoranthene	0.01 ug/L	-	<0.01	0.06	-
Fluorene	0.05 ug/L	-	<0.05	<0.05	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	-	<0.05	<0.05	-
1-Methylnaphthalene	0.05 ug/L	-	<0.05	<0.05	-
2-Methylnaphthalene	0.05 ug/L	-	<0.05	<0.05	-
Methylnaphthalene (1&2)	0.10 ug/L	-	<0.10	<0.10	-
Naphthalene	0.05 ug/L	-	<0.05	<0.05	-
Phenanthrene	0.05 ug/L	-	<0.05	0.07	-

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

	Client ID:	BH9-GW1	BH11-GW1	BH12-GW1	DUP
	Sample Date:	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00	28-Jul-20 09:00
	Sample ID:	2031305-09	2031305-10	2031305-11	2031305-12
	MDL/Units	Water	Water	Water	Water
Pyrene	0.01 ug/L	-	<0.01	0.05	-
2-Fluorobiphenyl	Surrogate	-	88.9%	89.7%	-
Terphenyl-d14	Surrogate	-	96.5%	91.0%	-

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

## Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
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						
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	18.7		ug/L		93.4	50-140			
Surrogate: Terphenyl-d14	24.0		ug/L		120	50-140			
<b>Volatiles</b>									
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						

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

### Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	85.3		ug/L		107	50-140			
Surrogate: Dibromofluoromethane	78.2		ug/L		97.7	50-140			
Surrogate: Toluene-d8	82.0		ug/L		103	50-140			

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

## Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
<b>Volatiles</b>									
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	84.7		ug/L		106	50-140			
Surrogate: Dibromofluoromethane	79.4		ug/L		99.2	50-140			
Surrogate: Toluene-d8	82.3		ug/L		103	50-140			

Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

## Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	1840	25	ug/L	ND	92.1	68-117			
F2 PHCs (C10-C16)	1720	100	ug/L	ND	108	60-140			
F3 PHCs (C16-C34)	4070	100	ug/L	ND	104	60-140			
F4 PHCs (C34-C50)	2720	100	ug/L	ND	109	60-140			
<b>Semi-Volatiles</b>									
Acenaphthene	5.12	0.05	ug/L	ND	102	50-140			
Acenaphthylene	4.63	0.05	ug/L	ND	92.5	50-140			
Anthracene	4.77	0.01	ug/L	ND	95.4	50-140			
Benzo [a] anthracene	4.51	0.01	ug/L	ND	90.2	50-140			
Benzo [a] pyrene	4.78	0.01	ug/L	ND	95.5	50-140			
Benzo [b] fluoranthene	5.89	0.05	ug/L	ND	118	50-140			
Benzo [g,h,i] perylene	4.90	0.05	ug/L	ND	98.0	50-140			
Benzo [k] fluoranthene	5.43	0.05	ug/L	ND	109	50-140			
Chrysene	4.96	0.05	ug/L	ND	99.2	50-140			
Dibenzo [a,h] anthracene	5.11	0.05	ug/L	ND	102	50-140			
Fluoranthene	4.70	0.01	ug/L	ND	93.9	50-140			
Fluorene	4.71	0.05	ug/L	ND	94.2	50-140			
Indeno [1,2,3-cd] pyrene	5.17	0.05	ug/L	ND	103	50-140			
1-Methylnaphthalene	5.01	0.05	ug/L	ND	100	50-140			
2-Methylnaphthalene	5.42	0.05	ug/L	ND	108	50-140			
Naphthalene	4.97	0.05	ug/L	ND	99.4	50-140			
Phenanthrene	4.54	0.05	ug/L	ND	90.8	50-140			
Pyrene	4.72	0.01	ug/L	ND	94.3	50-140			
Surrogate: 2-Fluorobiphenyl	19.9		ug/L		99.5	50-140			
Surrogate: Terphenyl-d14	24.0		ug/L		120	50-140			
<b>Volatiles</b>									
Acetone	79.2	5.0	ug/L	ND	79.2	50-140			
Benzene	36.5	0.5	ug/L	ND	91.4	60-130			
Bromodichloromethane	26.1	0.5	ug/L	ND	65.4	60-130			
Bromoform	24.2	0.5	ug/L	ND	60.6	60-130			
Bromomethane	32.8	0.5	ug/L	ND	82.1	50-140			
Carbon Tetrachloride	26.1	0.2	ug/L	ND	65.2	60-130			
Chlorobenzene	37.0	0.5	ug/L	ND	92.4	60-130			
Chloroform	31.8	0.5	ug/L	ND	79.5	60-130			
Dibromochloromethane	33.7	0.5	ug/L	ND	84.2	60-130			
Dichlorodifluoromethane	38.4	1.0	ug/L	ND	96.0	50-140			
1,2-Dichlorobenzene	40.3	0.5	ug/L	ND	101	60-130			
1,3-Dichlorobenzene	38.9	0.5	ug/L	ND	97.2	60-130			
1,4-Dichlorobenzene	39.3	0.5	ug/L	ND	98.2	60-130			
1,1-Dichloroethane	29.0	0.5	ug/L	ND	72.6	60-130			
1,2-Dichloroethane	40.9	0.5	ug/L	ND	102	60-130			
1,1-Dichloroethylene	30.0	0.5	ug/L	ND	74.9	60-130			
cis-1,2-Dichloroethylene	34.2	0.5	ug/L	ND	85.4	60-130			
trans-1,2-Dichloroethylene	30.9	0.5	ug/L	ND	77.3	60-130			
1,2-Dichloropropane	36.5	0.5	ug/L	ND	91.3	60-130			
cis-1,3-Dichloropropylene	26.4	0.5	ug/L	ND	66.1	60-130			
trans-1,3-Dichloropropylene	31.4	0.5	ug/L	ND	78.5	60-130			
Ethylbenzene	38.1	0.5	ug/L	ND	95.3	60-130			



Certificate of Analysis

Report Date: 05-Aug-2020

Client: Paterson Group Consulting Engineers

Order Date: 29-Jul-2020

Client PO: 30497

Project Description: PE4936

## Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylene dibromide (dibromoethane, 1,2-	32.0	0.2	ug/L	ND	79.9	60-130			
Hexane	34.3	1.0	ug/L	ND	85.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	98.3	5.0	ug/L	ND	98.3	50-140			
Methyl Isobutyl Ketone	97.1	5.0	ug/L	ND	97.1	50-140			
Methyl tert-butyl ether	79.9	2.0	ug/L	ND	79.9	50-140			
Methylene Chloride	28.0	5.0	ug/L	ND	69.9	60-130			
Styrene	34.7	0.5	ug/L	ND	86.7	60-130			
1,1,1,2-Tetrachloroethane	33.4	0.5	ug/L	ND	83.6	60-130			
1,1,2,2-Tetrachloroethane	34.6	0.5	ug/L	ND	86.4	60-130			
Tetrachloroethylene	34.6	0.5	ug/L	ND	86.5	60-130			
Toluene	37.2	0.5	ug/L	ND	92.9	60-130			
1,1,1-Trichloroethane	27.8	0.5	ug/L	ND	69.4	60-130			
1,1,2-Trichloroethane	34.5	0.5	ug/L	ND	86.2	60-130			
Trichloroethylene	33.0	0.5	ug/L	ND	82.4	60-130			
Trichlorofluoromethane	29.4	1.0	ug/L	ND	73.6	60-130			
Vinyl chloride	37.8	0.5	ug/L	ND	94.4	50-140			
m,p-Xylenes	76.6	0.5	ug/L	ND	95.8	60-130			
o-Xylene	38.2	0.5	ug/L	ND	95.5	60-130			
Surrogate: 4-Bromofluorobenzene	82.5		ug/L		103	50-140			
Surrogate: Dibromofluoromethane	78.8		ug/L		98.5	50-140			
Surrogate: Toluene-d8	79.7		ug/L		99.7	50-140			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30497

Report Date: 05-Aug-2020

Order Date: 29-Jul-2020

Project Description: PE4936

**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.



203/305

Nº 128585

Client Name: <b>PATERSON</b>	Project Ref: <b>PE4936</b>	Page <b>1</b> of <b>2</b>
Contact Name: <b>MARK D'ARCY</b>	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address: <b>154 COLONNADE Rd. S. OTTAWA, ON.</b>	PO #: <b>30497</b>	
Telephone: <b>(613) - 226 - 7381</b>	E-mail: <b>Mdarcy@PatersonGroup.ca</b>	
Date Required:		

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis											
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO	Matrix	Air Volume	# of Containers	Sample Taken	Date	Time	PHCs F1-F4+BTEX	VOCs & PHCs F1-F4	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA													
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm													
<input checked="" type="checkbox"/> Table <b>7</b> For RSC: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Mun: _____ <input type="checkbox"/> Other: _____															
Sample ID/Location Name																	
1	BH1 - GW1			GW	-	3	July 28/20										
2	BH2 - GW1				-	3											
3	BH3 - GW1				-	3											
4	BH4 - GW1				-	3											
5	BH5 - GW1				-	3											
6	BH6 - GW1				-	4											
7	BH7 - GW1				-	4											
8	BH8 - GW1				-	3											
9	BH9 - GW1				-	3											
10	BH11 - GW1				-	4											

Comments:		Method of Delivery: <b>Paracel</b>	
Relinquished By (Sign):	Received By Driver/Depot: <b>M. J. J. J.</b>	Received at Lab:	Verified By:
Relinquished By (Print): <b>Mark D'Arcy</b>	Date/Time: <b>29/07/20 1:05</b>	Date/Time: <b>7-29-2014</b>	Date/Time: <b>7-29-2014</b>
Date/Time: <b>July 29/2020</b>	Temperature: <b>17</b> °C	Temperature: <b>12</b> °C	pH Verified: <input type="checkbox"/> By: _____



## Certificate of Analysis

### Paterson Group Consulting Engineers

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

Client PO: 30369  
Project: PE4936  
Custody: 128491,128489

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

**Order #: 2029545**

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

Paracel ID	Client ID
2029545-01	BH1-20-SS3
2029545-02	BH2-20-SS2
2029545-03	BH3-20-SS3
2029545-04	BH6-20-SS2
2029545-05	BH6-20-SS4
2029545-06	BH7-20-AU1
2029545-07	BH7-20-SS5
2029545-08	BH8-20-SS3
2029545-09	BH9-20-SS2
2029545-10	BH11-20-SS3
2029545-11	BH12-20-SS2
2029545-12	BH12-20-SS4
2029545-13	Dup

Approved By:



Dale Robertson, BSc  
Laboratory Director

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

## Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	20-Jul-20	20-Jul-20
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	20-Jul-20	23-Jul-20
Conductivity	MOE E3138 - probe @25 °C, water ext	22-Jul-20	22-Jul-20
Mercury by CVAA	EPA 7471B - CVAA, digestion	22-Jul-20	22-Jul-20
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	22-Jul-20	22-Jul-20
PHC F1	CWS Tier 1 - P&T GC-FID	20-Jul-20	20-Jul-20
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	21-Jul-20	23-Jul-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	21-Jul-20	21-Jul-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	22-Jul-20	22-Jul-20
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	21-Jul-20	21-Jul-20
SAR	Calculated	22-Jul-20	23-Jul-20
Solids, %	Gravimetric, calculation	23-Jul-20	23-Jul-20



Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

	Client ID:	BH1-20-SS3	BH2-20-SS2	BH3-20-SS3	BH6-20-SS2
	Sample Date:	10-Jul-20 10:00	10-Jul-20 11:00	13-Jul-20 09:00	14-Jul-20 10:00
	Sample ID:	2029545-01	2029545-02	2029545-03	2029545-04
	MDL/Units	Soil	Soil	Soil	Soil

#### Physical Characteristics

% Solids	0.1 % by Wt.	93.2	94.3	94.7	82.7
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#### General Inorganics

SAR	0.01 N/A	-	-	-	2.93
Conductivity	5 uS/cm	-	-	-	534
pH	0.05 pH Units	-	7.93	-	-

#### Metals

Antimony	1.0 ug/g dry	-	<1.0	-	<1.0
Arsenic	1.0 ug/g dry	-	2.8	-	3.8
Barium	1.0 ug/g dry	-	55.8	-	53.6
Beryllium	0.5 ug/g dry	-	<0.5	-	<0.5
Boron	5.0 ug/g dry	-	6.6	-	<5.0
Cadmium	0.5 ug/g dry	-	<0.5	-	<0.5
Chromium	5.0 ug/g dry	-	11.7	-	20.3
Chromium (VI)	0.2 ug/g dry	-	<0.2	-	<0.2
Cobalt	1.0 ug/g dry	-	5.2	-	4.8
Copper	5.0 ug/g dry	-	15.5	-	12.1
Lead	1.0 ug/g dry	-	4.2	-	9.0
Mercury	0.1 ug/g dry	-	<0.1	-	<0.1
Molybdenum	1.0 ug/g dry	-	<1.0	-	<1.0
Nickel	5.0 ug/g dry	-	9.4	-	10.1
Selenium	1.0 ug/g dry	-	<1.0	-	<1.0
Silver	0.3 ug/g dry	-	<0.3	-	<0.3
Thallium	1.0 ug/g dry	-	<1.0	-	<1.0
Uranium	1.0 ug/g dry	-	<1.0	-	1.0
Vanadium	10.0 ug/g dry	-	15.4	-	30.2
Zinc	20.0 ug/g dry	-	26.3	-	31.8

#### Volatiles

Benzene	0.02 ug/g dry	<0.02	-	<0.02	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	<0.05	-
Toluene	0.05 ug/g dry	<0.05	-	<0.05	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	<0.05	-
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	117%	-	116%	-

#### Hydrocarbons

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

	Client ID:	BH1-20-SS3	BH2-20-SS2	BH3-20-SS3	BH6-20-SS2
	Sample Date:	10-Jul-20 10:00	10-Jul-20 11:00	13-Jul-20 09:00	14-Jul-20 10:00
	Sample ID:	2029545-01	2029545-02	2029545-03	2029545-04
	MDL/Units	Soil	Soil	Soil	Soil
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	177	-	49	-
F4 PHCs (C34-C50)	6 ug/g dry	163 [2]	-	64	-
F4G PHCs (gravimetric)	50 ug/g dry	408	-	-	-

**Semi-Volatiles**

Acenaphthene	0.02 ug/g dry	-	-	-	<0.02
Acenaphthylene	0.02 ug/g dry	-	-	-	<0.02
Anthracene	0.02 ug/g dry	-	-	-	<0.02
Benzo [a] anthracene	0.02 ug/g dry	-	-	-	<0.02
Benzo [a] pyrene	0.02 ug/g dry	-	-	-	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	-	-	-	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	-	-	-	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	-	-	-	<0.02
Chrysene	0.02 ug/g dry	-	-	-	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	-	-	<0.02
Fluoranthene	0.02 ug/g dry	-	-	-	<0.02
Fluorene	0.02 ug/g dry	-	-	-	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	-	-	<0.02
1-Methylnaphthalene	0.02 ug/g dry	-	-	-	<0.02
2-Methylnaphthalene	0.02 ug/g dry	-	-	-	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	-	-	-	<0.04
Naphthalene	0.01 ug/g dry	-	-	-	<0.01
Phenanthrene	0.02 ug/g dry	-	-	-	<0.02
Pyrene	0.02 ug/g dry	-	-	-	0.02
2-Fluorobiphenyl	Surrogate	-	-	-	77.3%
Terphenyl-d14	Surrogate	-	-	-	93.5%



Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

	Client ID:	BH6-20-SS4	BH7-20-AU1	BH7-20-SS5	BH8-20-SS3
	Sample Date:	14-Jul-20 10:00	14-Jul-20 13:00	14-Jul-20 13:00	14-Jul-20 14:00
	Sample ID:	2029545-05	2029545-06	2029545-07	2029545-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	91.7	86.5	82.7	94.6
General Inorganics					
pH	0.05 pH Units	-	-	7.61	-
Metals					
Antimony	1.0 ug/g dry	-	<1.0	-	-
Arsenic	1.0 ug/g dry	-	3.3	-	-
Barium	1.0 ug/g dry	-	108	-	-
Beryllium	0.5 ug/g dry	-	<0.5	-	-
Boron	5.0 ug/g dry	-	<5.0	-	-
Cadmium	0.5 ug/g dry	-	<0.5	-	-
Chromium	5.0 ug/g dry	-	26.2	-	-
Chromium (VI)	0.2 ug/g dry	-	<0.2	-	-
Cobalt	1.0 ug/g dry	-	6.7	-	-
Copper	5.0 ug/g dry	-	18.1	-	-
Lead	1.0 ug/g dry	-	16.1	-	-
Mercury	0.1 ug/g dry	-	<0.1	-	-
Molybdenum	1.0 ug/g dry	-	<1.0	-	-
Nickel	5.0 ug/g dry	-	14.6	-	-
Selenium	1.0 ug/g dry	-	<1.0	-	-
Silver	0.3 ug/g dry	-	<0.3	-	-
Thallium	1.0 ug/g dry	-	<1.0	-	-
Uranium	1.0 ug/g dry	-	<1.0	-	-
Vanadium	10.0 ug/g dry	-	35.5	-	-
Zinc	20.0 ug/g dry	-	43.6	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	-	<0.05	<0.05
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
Toluene-d8	Surrogate	120%	-	119%	118%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	<4	<4

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

	MDL/Units	Client ID:	BH6-20-SS4	BH7-20-AU1	BH7-20-SS5	BH8-20-SS3
		Sample Date:	14-Jul-20 10:00	14-Jul-20 13:00	14-Jul-20 13:00	14-Jul-20 14:00
		Sample ID:	2029545-05	2029545-06	2029545-07	2029545-08
			Soil	Soil	Soil	Soil
F3 PHCs (C16-C34)	8 ug/g dry		98	-	384 [3]	11
F4 PHCs (C34-C50)	6 ug/g dry		142 [2]	-	314 [2]	15
F4G PHCs (gravimetric)	50 ug/g dry		327	-	568	-

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

<b>Client ID:</b>	BH9-20-SS2	BH11-20-SS3	BH12-20-SS2	BH12-20-SS4
<b>Sample Date:</b>	14-Jul-20 15:00	15-Jul-20 10:00	15-Jul-20 11:00	15-Jul-20 11:30
<b>Sample ID:</b>	2029545-09	2029545-10	2029545-11	2029545-12
<b>MDL/Units</b>	Soil	Soil	Soil	Soil

**Physical Characteristics**

% Solids	0.1 % by Wt.	89.1	92.1	90.2	94.5
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**General Inorganics**

SAR	0.01 N/A	3.56	-	0.60	-
Conductivity	5 uS/cm	529	-	200	-

**Metals**

Antimony	1.0 ug/g dry	<1.0	-	<1.0	-
Arsenic	1.0 ug/g dry	4.8	-	2.8	-
Barium	1.0 ug/g dry	69.9	-	79.3	-
Beryllium	0.5 ug/g dry	<0.5	-	<0.5	-
Boron	5.0 ug/g dry	<5.0	-	5.1	-
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	-
Chromium	5.0 ug/g dry	20.0	-	16.3	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	<0.2	-
Cobalt	1.0 ug/g dry	5.1	-	5.8	-
Copper	5.0 ug/g dry	12.2	-	13.8	-
Lead	1.0 ug/g dry	11.9	-	13.3	-
Mercury	0.1 ug/g dry	<0.1	-	<0.1	-
Molybdenum	1.0 ug/g dry	<1.0	-	<1.0	-
Nickel	5.0 ug/g dry	11.0	-	10.9	-
Selenium	1.0 ug/g dry	<1.0	-	<1.0	-
Silver	0.3 ug/g dry	<0.3	-	<0.3	-
Thallium	1.0 ug/g dry	<1.0	-	<1.0	-
Uranium	1.0 ug/g dry	<1.0	-	<1.0	-
Vanadium	10.0 ug/g dry	26.9	-	23.1	-
Zinc	20.0 ug/g dry	38.4	-	28.3	-

**Volatiles**

Benzene	0.02 ug/g dry	-	<0.02	-	<0.02
Ethylbenzene	0.05 ug/g dry	-	<0.05	-	<0.05
Toluene	0.05 ug/g dry	-	<0.05	-	<0.05
m,p-Xylenes	0.05 ug/g dry	-	<0.05	-	<0.05
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	-	119%	-	115%

**Hydrocarbons**

F1 PHCs (C6-C10)	7 ug/g dry	-	<7	-	<7
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Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

	Client ID:	BH9-20-SS2	BH11-20-SS3	BH12-20-SS2	BH12-20-SS4
	Sample Date:	14-Jul-20 15:00	15-Jul-20 10:00	15-Jul-20 11:00	15-Jul-20 11:30
	Sample ID:	2029545-09	2029545-10	2029545-11	2029545-12
	MDL/Units	Soil	Soil	Soil	Soil
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	-	<40 [1]
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	-	405
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	-	564 [2]
F4G PHCs (gravimetric)	50 ug/g dry	-	-	-	1370

**Semi-Volatiles**

Acenaphthene	0.02 ug/g dry	0.04	-	<0.02	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	<0.02	-
Anthracene	0.02 ug/g dry	0.41	-	0.04	-
Benzo [a] anthracene	0.02 ug/g dry	0.56	-	0.05	-
Benzo [a] pyrene	0.02 ug/g dry	0.45	-	0.05	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.50	-	0.06	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.25	-	0.03	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.27	-	0.03	-
Chrysene	0.02 ug/g dry	0.55	-	0.05	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.07	-	<0.02	-
Fluoranthene	0.02 ug/g dry	1.29	-	0.12	-
Fluorene	0.02 ug/g dry	0.08	-	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.23	-	0.03	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	<0.04	-
Naphthalene	0.01 ug/g dry	0.01	-	<0.01	-
Phenanthrene	0.02 ug/g dry	0.80	-	0.10	-
Pyrene	0.02 ug/g dry	0.98	-	0.09	-
2-Fluorobiphenyl	Surrogate	103%	-	117%	-
Terphenyl-d14	Surrogate	107%	-	124%	-

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

Client ID:	Dup	-	-	-
Sample Date:	15-Jul-20 11:30	-	-	-
Sample ID:	2029545-13	-	-	-
MDL/Units	Soil	-	-	-

#### Physical Characteristics

% Solids	0.1 % by Wt.	92.2	-	-	-
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#### Volatiles

Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
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	-	-	-
Toluene-d8	Surrogate	117%	-	-	-

#### Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
Conductivity	ND	5	uS/cm						
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
F4G PHCs (gravimetric)	ND	50	ug/g						
<b>Metals</b>									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	1.64		ug/g		123	50-140			
Surrogate: Terphenyl-d14	1.73		ug/g		130	50-140			
<b>Volatiles</b>									
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						

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

**Method Quality Control: Blank**

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Toluene-d8	3.70		ug/g		116	50-140			

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

## Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>General Inorganics</b>									
SAR	0.04	0.01	N/A	0.04			0.0	30	
Conductivity	86.3	5	uS/cm	85.3			1.2	5	
pH	7.24	0.05	pH Units	7.25			0.1	2.3	
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	18	4	ug/g dry	21			16.0	30	
F3 PHCs (C16-C34)	33	8	ug/g dry	36			7.8	30	
F4 PHCs (C34-C50)	7	6	ug/g dry	ND			NC	30	
<b>Metals</b>									
Antimony	ND	1.0	ug/g dry	ND			NC	30	
Arsenic	2.8	1.0	ug/g dry	2.8			0.2	30	
Barium	60.2	1.0	ug/g dry	55.8			7.6	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron	7.2	5.0	ug/g dry	6.6			8.0	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g dry	ND			NC	35	
Chromium	11.9	5.0	ug/g dry	11.7			1.5	30	
Cobalt	5.2	1.0	ug/g dry	5.2			0.8	30	
Copper	14.9	5.0	ug/g dry	15.5			3.9	30	
Lead	4.2	1.0	ug/g dry	4.2			0.4	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	10.0	5.0	ug/g dry	9.4			6.5	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	14.5	10.0	ug/g dry	15.4			6.4	30	
Zinc	24.0	20.0	ug/g dry	26.3			9.0	30	
<b>Physical Characteristics</b>									
% Solids	77.9	0.1	% by Wt.	74.4			4.6	25	
<b>Semi-Volatiles</b>									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Chrysene	0.020	0.02	ug/g dry	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	ND	0.02	ug/g dry	ND			NC	40	
Pyrene	0.022	0.02	ug/g dry	0.021			6.4	40	
Surrogate: 2-Fluorobiphenyl	1.74		ug/g dry		108	50-140			
Surrogate: Terphenyl-d14	1.82		ug/g dry		113	50-140			
<b>Volatiles</b>									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	



Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

### Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	4.93		ug/g dry		121	50-140			

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

## Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Hydrocarbons</b>									
F1 PHCs (C6-C10)	176	7	ug/g	ND	87.8	80-120			
F2 PHCs (C10-C16)	95	4	ug/g	21	75.9	60-140			
F3 PHCs (C16-C34)	231	8	ug/g	36	81.8	60-140			
F4 PHCs (C34-C50)	134	6	ug/g	ND	88.6	60-140			
F4G PHCs (gravimetric)	1170	50	ug/g	ND	117	80-120			
<b>Metals</b>									
Antimony	41.3	1.0	ug/g	ND	82.3	70-130			
Arsenic	47.5	1.0	ug/g	1.1	92.8	70-130			
Barium	66.4	1.0	ug/g	22.3	88.2	70-130			
Beryllium	44.1	0.5	ug/g	ND	87.8	70-130			
Boron	42.6	5.0	ug/g	ND	79.9	70-130			
Cadmium	44.3	0.5	ug/g	ND	88.5	70-130			
Chromium (VI)	0.1	0.2	ug/g	ND	62.0	70-130			QM-05
Chromium	49.7	5.0	ug/g	ND	90.1	70-130			
Cobalt	46.1	1.0	ug/g	2.1	88.1	70-130			
Copper	48.3	5.0	ug/g	6.2	84.1	70-130			
Lead	40.3	1.0	ug/g	1.7	77.3	70-130			
Mercury	1.61	0.1	ug/g	ND	107	70-130			
Molybdenum	43.6	1.0	ug/g	ND	86.7	70-130			
Nickel	46.1	5.0	ug/g	ND	84.6	70-130			
Selenium	44.8	1.0	ug/g	ND	89.4	70-130			
Silver	45.6	0.3	ug/g	ND	91.1	70-130			
Thallium	47.2	1.0	ug/g	ND	94.4	70-130			
Uranium	47.1	1.0	ug/g	ND	93.8	70-130			
Vanadium	51.3	10.0	ug/g	ND	90.2	70-130			
Zinc	52.5	20.0	ug/g	ND	84.0	70-130			
<b>Semi-Volatiles</b>									
Acenaphthene	0.204	0.02	ug/g	ND	101	50-140			
Acenaphthylene	0.182	0.02	ug/g	ND	90.2	50-140			
Anthracene	0.185	0.02	ug/g	ND	91.9	50-140			
Benzo [a] anthracene	0.187	0.02	ug/g	ND	92.6	50-140			
Benzo [a] pyrene	0.195	0.02	ug/g	ND	96.8	50-140			
Benzo [b] fluoranthene	0.272	0.02	ug/g	ND	135	50-140			
Benzo [g,h,i] perylene	0.208	0.02	ug/g	ND	103	50-140			
Benzo [k] fluoranthene	0.242	0.02	ug/g	ND	120	50-140			
Chrysene	0.214	0.02	ug/g	ND	106	50-140			
Dibenzo [a,h] anthracene	0.199	0.02	ug/g	ND	98.9	50-140			
Fluoranthene	0.187	0.02	ug/g	ND	93.0	50-140			
Fluorene	0.190	0.02	ug/g	ND	94.5	50-140			
Indeno [1,2,3-cd] pyrene	0.207	0.02	ug/g	ND	103	50-140			
1-Methylnaphthalene	0.261	0.02	ug/g	ND	129	50-140			
2-Methylnaphthalene	0.280	0.02	ug/g	ND	139	50-140			
Naphthalene	0.226	0.01	ug/g	ND	112	50-140			
Phenanthrene	0.192	0.02	ug/g	ND	95.2	50-140			
Pyrene	0.188	0.02	ug/g	0.021	83.0	50-140			
Surrogate: 2-Fluorobiphenyl	1.88		ug/g		117	50-140			
Surrogate: Terphenyl-d14	1.70		ug/g		105	50-140			

## Volatiles

Certificate of Analysis

Report Date: 23-Jul-2020

Client: Paterson Group Consulting Engineers

Order Date: 17-Jul-2020

Client PO: 30369

Project Description: PE4936

### Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	3.01	0.02	ug/g	ND	75.2	60-130			
Ethylbenzene	4.48	0.05	ug/g	ND	112	60-130			
Toluene	4.32	0.05	ug/g	ND	108	60-130			
m,p-Xylenes	8.80	0.05	ug/g	ND	110	60-130			
o-Xylene	4.62	0.05	ug/g	ND	115	60-130			
Surrogate: Toluene-d8	2.81		ug/g		87.8	50-140			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 30369

Report Date: 23-Jul-2020

Order Date: 17-Jul-2020

Project Description: PE4936

**Qualifier Notes:**

***Sample Qualifiers :***

- 1 : Elevated detection limits due to the nature of the sample matrix.
- 2 : GC-FID signal did not return to baseline by C50
- 3 : Some peak(s) in the GC-FID Chromatogram are not typical of petroleum hydrocarbon distillates. May be the result of high concentrations of non-mineral based compounds not completely removed by the method cleanup. Results may be biased high.

***QC Qualifiers :***

QM-05 : The spike recovery was outside acceptance limits for the matrix spike due to matrix interference.

**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.

Parcel ID: 2029545



Blvd.  
4J8  
s.com

Parcel Order Number  
(Lab Use Only)

2029545

Chain Of Custody  
(Lab Use Only)

No 128491

Client Name: <u>Patterson</u>	Quote #: <u>PE4936</u>	Page <u>1</u> of <u>2</u>
Contact Name: <u>Mark D'Arcy</u>	Quote #: <u>30369</u>	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address:	E-mail:	
Telephone: <u>226-7781</u>	Date Required: _____	

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis												
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO	Matrix	Air Volume	# of Containers	Sample Taken	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PH
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA														
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU-Sani	<input type="checkbox"/> SU-Storm														
Mun: _____																		
For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No																		
Sample ID/Location Name																		
1	BH1-20-SS3				S		2	July 10/20	10am									
2	BH2-20-SS2						2	" "	11am									
3	BH3-20-SS3						2	July 13/20	9am									
4	BH6-20-SS2						2	July 14/20	10am									
5	BH6-20-SS4						2	" "	"									
6	BH7-20-AU1						1	"	1pm									
7	BH7-20-SS5						2	"	"									
8	BH8-20-SS3						2	"	2pm									
9	BH9-20-SS2						1	"	3pm									
10	BH11-20-SS3						2	July 15	10am									

Comments:		Method of Delivery: <u>Parade</u>	
Relinquished By (Sign): <u>[Signature]</u>	Received By Driver/Depot: <u>[Signature]</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Mark D'Arcy</u>	Date/Time: <u>17/07/20 3:34</u>	Date/Time: <u>7-17-2016</u>	Date/Time: <u>7-17-2016</u>
Date/Time: <u>July 17/20</u>	Temperature: _____ °C	Temperature: <u>19.5</u> °C	pH Verified: <input type="checkbox"/> By: _____



22845

Nº 128489

Client Name: <b>PGI</b>	Project Ref: <b>PE4936</b>	Page <b>2</b> of <b>2</b>
Contact Name:	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address:	PO #: <b>30369</b>	
Telephone:	E-mail:	
		Date Required: _____

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis														
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO																
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA																
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm																
<input checked="" type="checkbox"/> Table 7			Mun: _____																	
For RSC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																				
Sample ID/Location Name					Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)				
1	BH12-20-SS2				S		1	July 15	11 am											
2	BH12-20-SS4				S		2	2020	11:30	✓										
3	DUP				S		2	-	-	✓										
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:		Method of Delivery: <b>Hand Delivered</b>	
Relinquished By (Sign):	Received By Driver/Depot: <b>A. J. Cousens</b>	Received at Lab: <b>[Signature]</b>	Verified By: <b>[Signature]</b>
Relinquished By (Print):	Date/Time: <b>17/07/20 3:34</b>	Date/Time: <b>7-17-20 16:23</b>	Date/Time: <b>7-17-20 16:23</b>
Date/Time:	Temperature: <b>19.5</b> °C	Temperature: <b>19.5</b> °C	pH Verified: <input type="checkbox"/> By: _____