



**PATERSON  
GROUP**

# **Phase II Environmental Site Assessment**

44 Eccles Street  
Ottawa, Ontario

Prepared for Cornerstone Housing for Women

**Report: PE5434-2**  
**July 13, 2022**



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## **EXECUTIVE SUMMARY**

### **Assessment**

A Phase II ESA was conducted for the property addressed 44 Eccles Street, in the Ottawa, Ontario. The purpose of the Phase II ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I ESA and considered to result in areas of potential environmental concern (APECs) on the Phase II ESA Property.

The subsurface investigation consisted of four (4) boreholes, three of which were instrumented with groundwater monitoring wells. The general soil profile encountered during the field program consisted of fill material consisting of silty sand with some to trace clay, gravel and cobbles, overlying glacial till (silty sand with cobbles and boulders), followed by limestone bedrock.

Groundwater samples from monitoring wells BH1-21, BH2-21, BH4-21, MW3, MW6, MW9, and MW11 were collected during the sampling events from September to November of 2021. Free product or petroleum hydrocarbon sheen was noted within MW9 during the groundwater sampling events.

Groundwater samples were analyzed for VOCs, PHCs, PAHs and metals. Concentrations of benzene and PHC F2 were detected above the MECP Table 7 standards in Sample BH4-21-GW. The remaining groundwater results comply with the MECP Table 7 Standards.

### **Recommendations**

Based on the soil and groundwater test results, impacted soil and groundwater is present on the Phase II Property. Further soil and groundwater sampling should be conducted as part of the redevelopment of the site. Additional site-specific recommendations can be discussed as part of the redevelopment plans for the property.

### **Monitoring Wells**

If the monitoring wells installed on the subject site are not going to be used in the future or will be destroyed during site redevelopment, they should be abandoned according to Ontario Regulation 903, however, it is our recommendation that the wells be maintained for future monitoring purposes. The wells will be registered with the MECP under this regulation. Further Information can be provided upon request in this regard.

## 1.0 INTRODUCTION

At the request of Cornerstone Housing for Women, Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment at 44 Eccles Street, 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 ESA Property, during the Phase I ESA conducted by Paterson in September of 2021.

### 1.1 Site Description

Address: 44 Eccles Street, Ottawa, Ontario

Location: The site is located on the south side of the Eccles Street, between Booth Street and Lebreton Street North, in the City of Ottawa, Ontario. Refer to Figure 1 - Key Plan in the Figures section following the text.

Legal Description: PLAN 4908 LOTS 14 AND 15 PT; LOTS 5 AND 6.

Latitude and Longitude: 45° 24' 31.55" N, 75° 42' 33.74" W

#### Site Description:

Configuration: Rectangular

Area: 2,583 m<sup>2</sup> (approximately)

Zoning: GM[65] F(1.5) H(13.5) – General Mixed Use Zone.

### 1.2 Property Ownership

Paterson was engaged to conduct this Phase I-ESA by Ms. Sarah Davis of Cornerstone Housing for Women. The head office is located at 314 Booth Street, Ottawa, Ontario.

### 1.3 Current and Proposed Future Uses

The Phase II ESA Property is currently occupied by an office building and associated asphaltic concrete paved parking lot.

It is our understanding that the Phase II ESA Property will be redeveloped by retrofitting the interior of the office building currently present on the property.

## 1.4 Applicable Site Condition Standard

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

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

Section 35 of O.Reg. 153/04 does apply to the Phase II ESA Property in that the property does not rely upon potable groundwater.

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

Section 43.1 of O.Reg. 153/04 does apply to the Phase II ESA Property in that the property is a shallow soil property or the property is within 30 m of a water body.

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

## 2.0 BACKGROUND INFORMATION

### 2.1 Physical Setting

The Phase II property is a rectangular shaped parcel located south of Eccles Street, approximately 30 metres east of Booth Street, in the City of Ottawa, Ontario. Adjacent properties to the west, east, and south include residential dwellings, with commercial buildings (automotive repair garage adjacent south, office, and restaurant buildings adjacent east) present. The Phase I property features a three-storey brick clad office building on the north portion of the site, along Eccles Street, with the associated asphaltic parking area in the southern portion of the site.

## 2.2 Past Investigations

- ❑ 'Phase I Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,' prepared by Paterson, dated November 17, 2005;
- ❑ 'Phase II Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,' prepared by Paterson, dated February 28, 2006;
- ❑ 'Environmental Remediation Program, 44 Eccles Street, Ottawa, Ontario,' prepared by Paterson, dated April 27, 2006;

Paterson conducted environmental work on the Phase I property in 2005 and 2006, culminating in an environmental remediation program. Following the Phase I ESA investigation, a Phase II ESA was conducted to identify potential soil and groundwater impacts from former heating methods, specifically furnace oil. The Phase II ESA involved placing ten (10) boreholes on the Phase I property, of which one (1) was completed as a groundwater monitoring well. Based on the results of the Phase II - ESA, it was considered likely that a furnace oil UST had been used on site resulting in the observed contamination of the subsurface environment, and a remediation program was recommended and subsequently conducted. The remediation project consisted of the excavation and off-site disposal of 820 metric tonnes of petroleum hydrocarbon impacted soil from the subject property surrounding the identified tank nest location, located south of the building. A total of 18,000 litres of impacted groundwater were also removed during the remediation program. It should be noted that at the time of this environmental work, the MOE 2004 site standards were used, and as such, soil and/or groundwater may be in excess of current MECP standards.

- ❑ "Phase I Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario," prepared by CM3 Environmental Inc, dated September 27, 2016;

Based on the report, several potentially contaminating activities (PCAs) within the Phase I study area were identified. These PCAs resulted in the following APECs:

- ❑ APEC 1 – Former UST on-site and remediation to 2004 MOE Standards may not be in compliance with current MECP Standards;
- ❑ APEC 2 – Former Auto Body facility (347 Booth) may be a source for solvents and metals;

- ❑ APEC 3 – Existing Automotive Garage at 70 LeBreton;
- ❑ APEC 4 – Existing and former Automotive Garages at 297 Booth and Laundries at 304 and 313 Booth;
- ❑ APEC 5 – Former Gasoline Service Stations at 770 Somerset and Dry Cleaners at 716 Somerset;
- ❑ APEC 6 – Various former Laundries at 777, 787, 789 and 791 Somerset;
- ❑ APEC 7 – Former Glazier and Leaded Glass at 52-1/2 LeBreton.

As a result of the Phase I ESA findings, a Phase II ESA was recommended to address the above noted potential environmental concerns.

- ❑ 'Phase II Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,' prepared by CM3 Environmental, dated December 2017;

The Phase II ESA involved drilling 12 boreholes across the Phase I property, 10 of which were instrumented with groundwater monitoring wells, to assess soil and groundwater quality. The subsurface profile consists of asphalt or topsoil over silty sand and gravel fill, extending to shallow limestone bedrock, encountered between 1.22 m to 2.44 m below ground surface.

A total of 39 soil samples were obtained by means of split-spoon sampling, of which 12 were submitted for analysis of BTEX, PHCs, VOCs, metals and/or PAHs. Six (6) samples were found to exceed the MECP Table 7 Commercial standards for PHCs fraction F2 and/or F3 (MW1 SA4, MW3 SA1, MW8 SA3, MW11 SA3, MW12 SA4, MW10 SA3) while two (2) samples exceeded the MECP Table 7 standards for metals concentrations (MW12 SA3, MW1 SA4; lead and thallium respectively). The remaining four (4) soil samples analyzed did not identify any concentrations in excess of the MECP Table 7 standards.

Groundwater samples were obtained from the 10 onsite monitoring wells, and analyzed for BTEX, PHCs, VOCs, metals, and/or PAHs. Three (3) groundwater samples were found to be in excess of MECP Table 7 Standards, for PHCs (MW3), PAHs (MW6), and both PHCs and PAHs (MW9). The remaining samples analyzed did not identify any concentrations in excess of MECP Table 7 standards.



Based on the results of the CM3 Phase II ESA, contaminants of concern identified on the Phase I property include PHCs and metals in the soil, and PHCs and PAHs in the groundwater.

- *“Phase I Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,”* prepared by Paterson Group Inc., dated July 13, 2022.

Based on the historical review, records update and site visit, several potentially contaminating activities (PCAs) were identified on the Phase I property and within the Phase I study area considered to represent Areas of Potential Environmental Concern (APECs) on the subject site. The following APECs are considered to exist on the Phase I ESA property:

- APEC 1 – Former UST;
- APEC 2 – Former Auto Body Shop;
- APEC 3 – Existing Automotive Garage;
- APEC 4 –Automotive Service Garage and Dry Cleaners;
- APEC 5 – Former Gasoline Service Stations and Dry Cleaners;
- APEC 6 – Existing Transformer;
- APEC 7 – Former Glazier and Glass Works;
- APEC 8 – Fill Material of Unknown Quality.

No other PCAs were considered to represent APECs on the Phase I ESA Property were identified during the Phase I ESA Update.

## **3.0 SCOPE OF INVESTIGATION**

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

The subsurface investigation was conducted on October 21, 2021 and November 11, 2021. The field program consisted of drilling four (4) boreholes to address the APECs identified on the Phase II ESA Property. All of the boreholes (BH1-21 through BH4-21) were cored into the bedrock and completed with monitoring well installations, with the exception of BH3-21. Boreholes were drilled to a maximum depth of 7.7 m below the ground surface (mbgs).

### **3.2 Media Investigated**

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

Contaminants of potential concern on the Phase II ESA Property include benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, F1-F4) and metals (including arsenic, antimony and selenium). These CPCs may be present in the soil and/or groundwater beneath the Phase II ESA Property.

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

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

The Phase I property is located in an area of interbedded limestone and shale of the Verulam formation, with an overburden consisting of glacial till and an approximate drift thickness of 0 to 3 m (Geological Survey of Canada, Urban Geology of the National Capital Area). Based on information from previous environmental investigations, the overburden depth ranges from 1.2 to 2.4 m below existing ground surface, generally containing silty sand and gravel fill, with some areas of native silty sand to sandy silt extending to bedrock.

The topography of the site slopes downwards to the south, while the regional topography slopes down towards the northwest, towards the Ottawa River. Groundwater on the Phase I property is inferred to flow in a western direction. Based on the 2017 Phase II ESA groundwater monitoring event, the interpreted flow direction is towards the southwest.

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

No water bodies or areas of natural significance were identified on the site or in the Phase I study area.

#### **Drinking Water Wells**

No drinking water wells are located at the subject site or within the Phase I study area.

#### **Existing Buildings and Structures**

The property features a three-storey brick clad poured foundation office building, with an asphaltic concrete parking area in the southern portion of the site. The building features a flat modified bituminous roof. The building was constructed the mid 1930s.

## Subsurface Structures and Utilities

Underground utilities on the Phase II property include a private hydro wire extending along the east property line from the on-site southern pad mounted transformer and connecting to the southern building face. Private gate wires are present in the northeast and northwest property corners, as well as water and sewer utilities extending from the north building face towards Eccles Street.

## Neighbouring Land Use

Neighbouring land use is commercial (auto repair centre, take-out restaurant) and residential.

## Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Section 7.1 of this report, the APECs are summarized in Table 2, along with their respective locations and contaminants of potential concern (CPCs).

| <b>Table 2: Potentially Contaminating Activities and Areas of Potential Environmental Concern</b> |  |   |  |  |  |
|---|--|---|--|--|--|
| <b>Area of Potential Environmental Concern</b>  | <b>Location of Area of Potential Environmental Concern</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 (Groundwater, Soil, and/or Sediment)</b> |
| APEC 1<br>Former UST  | Central portion of the Phase I property                    | Item 28 – Gasoline and Associated Products Storage in Fixed Tanks   | On-Site                                      | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX | Soil and Groundwater   |
| APEC 2<br>Former Auto Body Shop   | Southwest corner of the Phase I property                   | Item 10 – Commercial Autobody Shops   | 40 metres South of the Phase I Property      | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX | Groundwater  |
| APEC 3<br>Existing Automotive Service Garage  | Southern portion of the Phase I property                   | Item 52 – Storage, Maintenance, fuelling and repair of equipment vehicles, and material used to maintain transportation systems | Adjacent Southeast of the Phase I Property   | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX | Groundwater  |

| <b>Table 2: Potentially Contaminating Activities and Areas of Potential Environmental Concern</b> |  |   |   |  |  |
|---|--|---|---|--|--|
| <b>Area of Potential Environmental Concern</b>  | <b>Location of Area of Potential Environmental Concern</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 (Groundwater, Soil, and/or Sediment)</b> |
| APEC 4<br>Automotive Service<br>Garage and Dry<br>Cleaners  | Northern portion<br>of the Phase I<br>Property             | Item 52 – Storage,<br>Maintenance,<br>fuelling and repair of<br>equipment vehicles,<br>and material used to<br>maintain<br>transportation<br>systems<br><br>Item 37 - Operation<br>of Dry Cleaning<br>Equipment (where<br>chemicals are used) | North of<br>the Phase<br>I Property<br>(Various<br>Places)        | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX<br>VOCs | Groundwater  |
| APEC 5<br>Former Gasoline<br>Service Stations and<br>Dry Cleaners                                 | Northeastern<br>portion of the<br>Phase I Property         | Item 28 – Gasoline<br>and Associated<br>Products Storage in<br>Fixed Tanks<br><br>Item 37 - Operation<br>of Dry Cleaning<br>Equipment (where<br>chemicals are used)   | Northeast<br>of the<br>Phase I<br>Property<br>(Various<br>Places) | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX<br>VOCs | Groundwater  |
| APEC 6<br>Existing Transformer  | Southeast<br>corner of the<br>Phase I property             | Item 55: Transformer<br>Manufacturing,<br>Processing and Use  | On-Site   | PCBs   | Soil   |
| APEC 7<br>Former Glazier and<br>Glass Works   | Northeastern<br>portion of Phase<br>I Property             | Item 29 - Glass<br>Manufacturing  | Adjacent<br>East of the<br>Phase I<br>Property                    | Metals   | Groundwater  |

| <b>Table 2: Potentially Contaminating Activities and Areas of Potential Environmental Concern</b> |  |   |  |  |  |
|---|--|---|--|--|--|
| <b>Area of Potential Environmental Concern</b>  | <b>Location of Area of Potential Environmental Concern</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 (Groundwater, Soil, and/or Sediment)</b> |
| APEC 8<br>Fill Material of Unknown Quality  | Throughout the Phase I property                            | Item 30 – Importation of Fill Material of Unknown Quality | On-Site                                      | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX<br>PAHs<br>Metals | Soil   |

The remaining PCAs are not considered to represent an APEC on the subject site based on their separation distance and/or their down/cross gradient locations.

### **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 potentially contaminating activities (PCAs) on the Phase I property that have resulted in areas of potential environmental concern (APECs). The presence of PCAs generating APECs was confirmed by a variety of independent sources. As such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

## **3.4 Impediments**

No physical impediments were encountered during the Phase II ESA field program.

## **4.0 INVESTIGATION METHOD**

### **4.1 Subsurface Investigation**

The subsurface investigation conducted for this Phase II ESA consisted of drilling four (4) boreholes (BH1-21 through BH4-21) across the Phase II ESA Property. The boreholes were drilled to a maximum depth of 7.7 m below ground surface (bgs) to intercept groundwater.

The boreholes were drilled using a low clearance track mounted drill rig operated by George Downing Estate Drilling of Hawkesbury, Ontario, under full-time

supervision of Paterson personnel. The borehole locations are indicated on the attached Drawing PE5434-3 - Test Hole Location Plan.

## 4.2 Soil Sampling

A total of 8 soil samples and eleven (11) rock core samples were obtained from the boreholes by means of grab sampling from auger flights/auger samples and split spoon sampling. Split spoon samples were taken at approximate 0.76 m intervals.

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

The borehole profiles generally consist of fill material consisting of silty sand, traces of gravel, crushed stone, brick, and cobble, overlying glacial till (silty sand with gravel, cobbles and boulders) followed by limestone bedrock.

## 4.3 Field Screening Measurements

Soil samples recovered at the time of sampling were placed immediately into airtight plastic bags with nominal headspace. All lumps of soil inside the bags were broken by hand, and the soil was allowed to come to room temperature prior to conducting the vapour survey. Allowing the samples to stabilize to room temperature ensures consistency of readings between samples.

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

No sufficient amount of sample was recovered to obtain vapour readings. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1. The results of the vapour survey are presented on the Soil Profile and Test Data sheets.

## 4.4 Groundwater Monitoring Well Installation

Three (3) groundwater monitoring wells were installed on the Phase II ESA Property as part of the subsurface investigation. The monitoring wells consisted of 32 mm diameter, Schedule 40 threaded PVC risers and screens. Monitoring well

construction details are listed below in Table 2 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

Borehole locations and elevations were surveyed geodetically by Paterson personnel.

| Well ID | Ground Surface Elevation | Total Depth (m BGS) | Screened Interval (m BGS) | Sand Pack (m BGS) | Bentonite Seal (m BGS) | Casing Type |
|---------|--------------------------|---------------------|---------------------------|-------------------|------------------------|-------------|
| BH1-21  | 68.78                    | 4.57                | 1.52-4.57                 | 1.22-4.57         | 0.18-1.22              | Flushmount  |
| BH2-21  | 69.55                    | 7.62                | 4.57-7.62                 | 4.27-7.62         | 0.18-4.27              | Flushmount  |
| BH4-21  | 68.53                    | 4.01                | 0.97-4.01                 | 0.81-4.01         | 0.18-0.81              | Flushmount  |

## 4.5 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.

## 4.6 Analytical Testing

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

| Sample ID                 | Screened Interval | Parameters Analyzed |      |      |        | Rationale  |
|---------------------------|-------------------|---------------------|------|------|--------|--|
|                           |                   | PHCs (F1-F4)        | VOCs | PAHs | Metals |  |
| <b>September 1, 2021</b>  |                   |                     |      |      |        |  |
| MW3-GW                    | 2.56-5.61         | x                   |      |      |        | Confirm groundwater quality identified in previous reports |
| MW6-GW                    | 2.13-5.18         |                     |      | x    |        |  |
| MW11-GW                   | 2.89-5.94         |                     |      |      | x      |  |
| <b>September 27, 2021</b> |                   |                     |      |      |        |  |

| <b>TABLE 3: Groundwater Samples Submitted and Analyzed Parameters</b> |                   |                     |      |      |        |  |
|---|-------------------|---------------------|------|------|--------|--|
| Sample ID   | Screened Interval | Parameters Analyzed |      |      |        | Rationale  |
|   |                   | PHCs (F1-F4)        | VOCs | PAHs | Metals |  |
| MW3-GW2   | 2.56-5.61         | x                   |      |      |        | Confirm groundwater quality identified in previous reports   |
| MW6-GW2   | 2.13-5.18         |                     |      | x    |        |  |
| <b>October 25, 2021</b>   |                   |                     |      |      |        |  |
| MW9-GW  | 2.08-5.13         | x                   | x    |      |        | Confirm groundwater quality identified in previous reports   |
| BH1-21-GW   | 1.55-4.60         | x                   | x    |      |        | Assess groundwater for potential impacts related to the identified potentially contaminating activities on-site. |
| BH2-21-GW   | 4.65-7.70         | x                   | x    |      |        |  |
| <b>November 18, 2021</b>  |                   |                     |      |      |        |  |
| BH4-21-GW   | 0.96-4.01         |                     |      |      | x      | Assess groundwater for potential impacts related to the identified potentially contaminating activities on-site. |

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.

#### **4.7 Residue Management**

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

#### **4.8 Elevation Surveying**

Boreholes were surveyed at geodetic elevations by Paterson personnel.



## 5.0 REVIEW AND EVALUATION

### 5.1 Geology

Site soils consist of fill material consisting of silty sand, traces of gravel, crushed stone, brick, and cobble, overlying glacial till (silty sand with gravel, cobbles and boulders) followed by limestone bedrock.

Bedrock was encountered at depths ranging from 0.5 to 2.4 m below the existing grade. The upper bedrock is fractured, becoming more competent with depth. Groundwater was encountered in this unit and is considered to be an aquifer.

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

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

Groundwater levels were measured during the groundwater sampling events on October 25, 2021 and November 18, 2021 using an electronic water level meter. Groundwater levels are summarized below in Table 5.

| <b>Borehole Location</b> | <b>Ground Surface Elevation (m)</b> | <b>Water Level Depth (m below grade)</b> | <b>Water Level Elevation (m ASL)</b> | <b>Date of Measurement</b> |
|--------------------------|-------------------------------------|--|--------------------------------------|----------------------------|
| BH1-21                   | 68.78                               | 1.39                                     | 58.62                                | October 25, 2021           |
| BH2-21                   | 69.55                               | 1.62                                     | 60.64                                | October 25, 2021           |
| BH4-21                   | 68.53                               | 1.08                                     | 61.42                                | November 18, 2021          |

Based on the groundwater elevations measured during the sampling events, groundwater contour mapping was completed. Groundwater contours are shown on Drawing PE5434-3 – Test Hole Location Plan.

Based on the contour mapping, groundwater flow at the subject site is in a westerly direction. A horizontal hydraulic gradient of approximately 0.026m/m was calculated.

### 5.3 Groundwater Quality

Groundwater samples from monitoring wells installed in BH1-21, BH2-21 and BH4-21 were submitted for laboratory analysis of VOCs and PHC (fractions, F1-F4) analyses. Several existing monitoring wells were resampled as part of this assessment and submitted for laboratory analysis of VOCs and PHCs, PAHs, and

metals. The groundwater samples were obtained from the screened intervals noted in Table 1. The results of the analytical testing are appended to this report. The laboratory certificates of analysis are provided in Appendix 1.

Detectable metals, VOCs, PAHs and PHCs were identified in the samples analyzed. Benzene and PHC F2 in Sample BH4-21-GW was identified to exceed the MECP Table 7 standards. The remaining groundwater results comply with the MECP Table 7 Standards.

The analytical results tested in groundwater are shown on Drawing PE5434-5– Analytical Testing Plan – Groundwater.

The maximum concentrations of analyzed parameters in the groundwater at the site are appended to this report.

Remaining parameters analysed were not identified above the laboratory method detection limits.

## **5.4 Quality Assurance and Quality Control Results**

All samples submitted as part of the March 2021 sampling events were handled in accordance with the Analytical Protocol with respect to preservation method, storage requirement, and container type.

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

Based on the analytical laboratory results, it is our opinion that the overall quality of the field data collected during this Phase II-ESA is considered to be sufficient to meet the overall objectives of this assessment.

## **5.5 Phase II Conceptual Site Model**

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

## Site Description

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

Based on the results of the Phase I ESA and the Phase I ESA Update completed for the Phase II ESA property, the following APECs were identified on the Phase II ESA property. The APECs are summarized in Table 1.

| <b>Table 1. Areas of Potential Environmental Concern</b>    |   |   |  |  |  |
|---|---|---|--|--|--|
| <b>Area of Potential Environmental Concern</b>              | <b>Location of Area of Potential Environmental Concern with respect to Phase I 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 (Groundwater, Soil, and/or Sediment)</b> |
| APEC 1<br>Former UST  | Central portion of the Phase I property   | Item 28 – Gasoline and Associated Products Storage in Fixed Tanks   | On-Site  | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX         | Soil and Groundwater   |
| APEC 2<br>Former Auto Body Shop                             | Southwest corner of the Phase I property  | Item 10 – Commercial Autobody Shops   | 40 metres South of the Phase I Property            | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX         | Soil and Groundwater   |
| APEC 3<br>Existing Automotive Service Garage                | Southern portion of the Phase I property  | Item 52 – Storage, Maintenance, fuelling and repair of equipment vehicles, and material used to maintain transportation systems   | Adjacent Southeast of the Phase I Property         | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX         | Soil and Groundwater   |
| APEC 4<br>Automotive Service Garage and Dry Cleaners        | Northern portion of the Phase I Property  | Item 52 – Storage, Maintenance, fuelling and repair of equipment vehicles, and material used to maintain transportation systems<br><br>Item 37 - Operation of Dry Cleaning Equipment (where chemicals are used) | North of the Phase I Property (Various Places)     | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX<br>VOCs | Groundwater  |
| APEC 5<br>Former Gasoline Service Stations and Dry Cleaners | Northeastern portion of the Phase I Property  | Item 28 – Gasoline and Associated Products Storage in Fixed Tanks<br><br>Item 37 - Operation of Dry Cleaning  | Northeast of the Phase I Property (Various Places) | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX<br>VOCs | 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 with respect to Phase I 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 (Groundwater, Soil, and/or Sediment)</b> |
|  |   | Equipment (where chemicals are used)                      |  |  |  |
| APEC 6 Existing Transformer                              | Southeast corner of the Phase I property  | Item 55: Transformer Manufacturing, Processing and Use    | On-Site                                      | PCBs   | Soil   |
| APEC 7 Former Glazier and Glass Works                    | Northeastern portion of Phase I Property  | Item 29 - Glass Manufacturing                             | Adjacent East of the Phase I Property        | Metals   | Groundwater  |
| APEC 8 Fill Material of Unknown Quality                  | Throughout the Phase I property   | Item 30 – Importation of Fill Material of Unknown Quality | On-Site                                      | PHCs (F <sub>1</sub> -F <sub>4</sub> )<br>BTEX<br>PAHs<br>Metals | Soil   |

### **Contaminants of Potential Concern**

The contaminants of potential concern (CPCs) identified in the Phase II ESA property include Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Petroleum Hydrocarbons (PHCs, F<sub>1</sub>-F<sub>4</sub>), VOCs, PAHs, PCBs, and Metals in the soil and/or groundwater.

### **Subsurface Structures and Utilities**

Underground utilities on the Phase II property include a private hydro wire extending along the east property line from the on-site southern pad mounted transformer and connecting to the southern building face. Private gate wires are present in the northeast and northwest property corners, as well as water and sewer utilities extending from the north building face towards Eccles Street.

## Physical Setting

### Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is illustrated on the attached cross-section. The stratigraphy of the Phase II ESA property generally consists of:

- ❑ Asphaltic concrete, ranging in thickness from 0.05 to 0.10 m, with a concrete slab approximately 0.25 m in thickness in the building footprint area.
- ❑ Fill, consisting of brown silty sand with some to trace clay, gravel, brick, and cobbles, varying in thickness from 0.5 to 2.4 m. The fill material is not expected to be a significant water bearing unit at the Phase II ESA property. Groundwater was not observed in this stratigraphic unit.
- ❑ Intermittent layer of native glacial till, consisting of brown silty sand with gravel, cobbles, and boulders, varying in thickness from 0.2 to 0.4 m.
- ❑ Grey limestone bedrock, encountered at depths ranging from 0.5 to 2.4 m below the existing grade. The upper bedrock is fractured, becoming more competent with depth. Groundwater was encountered in this unit and is considered to be an aquifer.

### Hydrogeological Setting

The Geological Survey of Canada (GSC) website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, the Phase II property is located in an area of interbedded limestone and shale of the Verulam formation, with an overburden consisting of glacial till and an approximate drift thickness of 0 to 3 m. The geological description of the site on the GSC web site was generally consistent with the results of the previous subsurface investigations, with overburden encountered to be between 0.5 m and 2.4 m thick.

Based on the 2017 Phase II ESA, groundwater beneath the Phase II property was inferred to flow in a southwesterly direction.

### Approximate Depth to Bedrock

Bedrock was encountered approximately 1.2 to 2.4 m below the existing ground surface (0.5 m below the top of the building slab).

## **Approximate Depth to Water Table**

Depth to the water table at the Phase II property varied from approximately 1.0 to 2.0 m below the existing ground surface based on recent groundwater monitoring events.

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

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the Phase II ESA property. A search for areas of natural significance and features was completed on the Ontario Ministry of Natural Resources (MNR) website as part of the Phase I ESA within the Phase I ESA Study Area (250m Radius from site boundary) and did not reveal any areas of natural significance or environmentally sensitive areas within the Phase I ESA Study Area.

Section 43.1 of the Regulation does apply to the Phase II ESA property in that the subject site is a shallow soil property.

## **Fill Placement**

Fill material is present on-site as the uppermost layer of overburden soil, comprising the majority of on-site soil. Visual screening and analytical testing indicate that the fill material is contaminated with PHCs (F2-F3) and metals (lead and thallium) exceeding MECP Table 7 Standards

## **Existing Structures and Utilities**

The Phase II ESA property is currently occupied by a three-storey brick clad commercial office building.

Underground utilities on the Phase II property include a private hydro wire extending along the east property line from the southern pad mounted transformer and connecting to the southern building face. Private gate wires are present in the northeast and northwest property corners, as well as water and sewer utilities extending from the north building face towards Eccles Street. A natural gas pipeline extends from Eccles Street along the western property line and connects near the centre of the southern building face.

The utility trenches are not expected to affect contaminant distribution and transport, based their shallow depth and the nature of the contaminants.

## **Proposed Buildings and Other Structures**

The proposed development plans for the property include a retrofit of the interior of the existing building, including the addition of elevators for access.

## **Environmental Condition**

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

Based on the analytical test results, fill material exceeding the selected MECP Table 7 Residential Standards for metals (lead and thallium) and PHCs is present beneath the rear parking area of the Phase II property.

Analytical results for groundwater exceeded the MECP Table 7 Standards for BTEX and PHCs adjacent to the wall of the building. All other groundwater sampling locations are considered to be in compliance with the MECP Table 7 Standards.

### **Types of Contaminants**

Based on the analytical test results, the contaminants of concern on the Phase II ESA property include Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Petroleum Hydrocarbons (PHCs, F1-F4), and/or Metals in the soil and/or groundwater.

### **Contaminated Media**

Based on the results of the Phase II ESA, soil on the Phase II property is contaminated with lead, thallium, and PHCs (F2-F3), and groundwater is contaminated with PHCs (F2-F3) and benzene.

### **What Is Known About Areas where Contaminants are Present**

The impacted soil is considered to be related to the importation of fill material prior to the construction of the rear parking lot. The source of the impacted groundwater is not known at this time.

### **Distribution of Contaminants**

The impacted soil is considered to be present throughout the rear parking area of the site, while the impacted groundwater is confined to the southeastern building corner.

## **Discharge of Contaminants**

The impacted fill material is considered to be associated with the placement of poor-quality fill material, and not a specific discharge event. The conditions leading to the impacted groundwater on the Phase II ESA property is not known at this time.

## **Distribution and Migration of Contaminants**

Based on the findings of the Phase II ESA, the distribution of BTEX and PHC contaminants in groundwater appear to be adjacent to the southeast building corner. Based on the analytical test results from the adjacent monitoring wells, it appears that the migration of impacted water is limited. The groundwater within the rear parking area is in compliance with the applicable standards. The impacts associated with the poor quality fill material are not considered to have migrated.

## **Climatic and Meteorological Conditions**

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally. Based on the results of the subsurface investigation, BTEX and PHC contaminant distribution is likely to have occurred at the Phase II property.

## **Potential for Vapour Intrusion**

Based on the nature of the contaminated material, and the footings of the building likely extending to the bedrock surface, the potential for vapour intrusion is considered to be low.



## 6.0 CONCLUSIONS

### Assessment

A Phase II ESA was conducted for the property addressed 44 Eccles Street, in the Ottawa, Ontario. The purpose of the Phase II ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I ESA and considered to result in areas of potential environmental concern (APECs) on the Phase II ESA Property.

The subsurface investigation consisted of four (4) boreholes, three of which were instrumented with groundwater monitoring wells. The general soil profile encountered during the field program consisted of fill material consisting of silty sand with some to trace clay, gravel and cobbles, overlying glacial till (silty sand with cobbles and boulders), followed by limestone bedrock.

Groundwater samples from monitoring wells BH1-21, BH2-21, BH4-21, MW3, MW6, MW9, and MW11 were collected during the sampling events from September to November of 2021. Free product or petroleum hydrocarbon sheen was noted within MW9 during the groundwater sampling events.

Groundwater samples were analyzed for VOCs, PHCs, PAHs and metals. Concentrations of benzene and PHC F2 were detected above the MECP Table 7 standards in Sample BH4-21-GW. The remaining groundwater results comply with the MECP Table 7 Standards.

### Recommendations

Based on the soil and groundwater test results, impacted soil and groundwater is present on the Phase II Property. Further soil and groundwater sampling should be conducted as part of the redevelopment of the site. Additional site-specific recommendations can be discussed as part of the redevelopment plans for the property.

#### Monitoring Wells

If the monitoring wells installed on the subject site are not going to be used in the future or will be destroyed during site redevelopment, they should be abandoned according to Ontario Regulation 903, however, it is our recommendation that the wells be maintained for future monitoring purposes. The wells will be registered with the MECP under this regulation. Further Information can be provided upon request in this regard.

## 7.0 STATEMENT OF LIMITATIONS

This Phase II - Environmental Site Assessment report has been prepared under the supervision of a Qualified Person, in general accordance with O.Reg. 153/04, as amended, and meets the requirements of CSA Z769-00 (reaffirmed 2022). The conclusions presented herein are based on information gathered from a limited sampling and testing program. The test results represent conditions at specific test locations at the time of the field program.

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

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

This report was prepared for the sole use of Cornerstone Housing for Women. Notification from Cornerstone Housing for Women and Paterson Group will be required to release this report to any other party.

### **Paterson Group Inc.**

Joshua Dempsey, B.Sc.



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



### **Report Distribution:**

- Cornerstone Housing for Women
- Paterson Group

# **FIGURES**

**Figure 1 - Key Plan**

**Drawing PE5434-3 – Test Hole Location Plan**

**Drawing PE5434-4 – Analytical Testing Plan – Soil**

**Drawing PE5434-4A – Cross-section A-A' – Soil**

**Drawing PE5434-5 – Analytical Testing Plan - Groundwater**

**Drawing PE5434-5A – Cross-section A-A' – Groundwater**

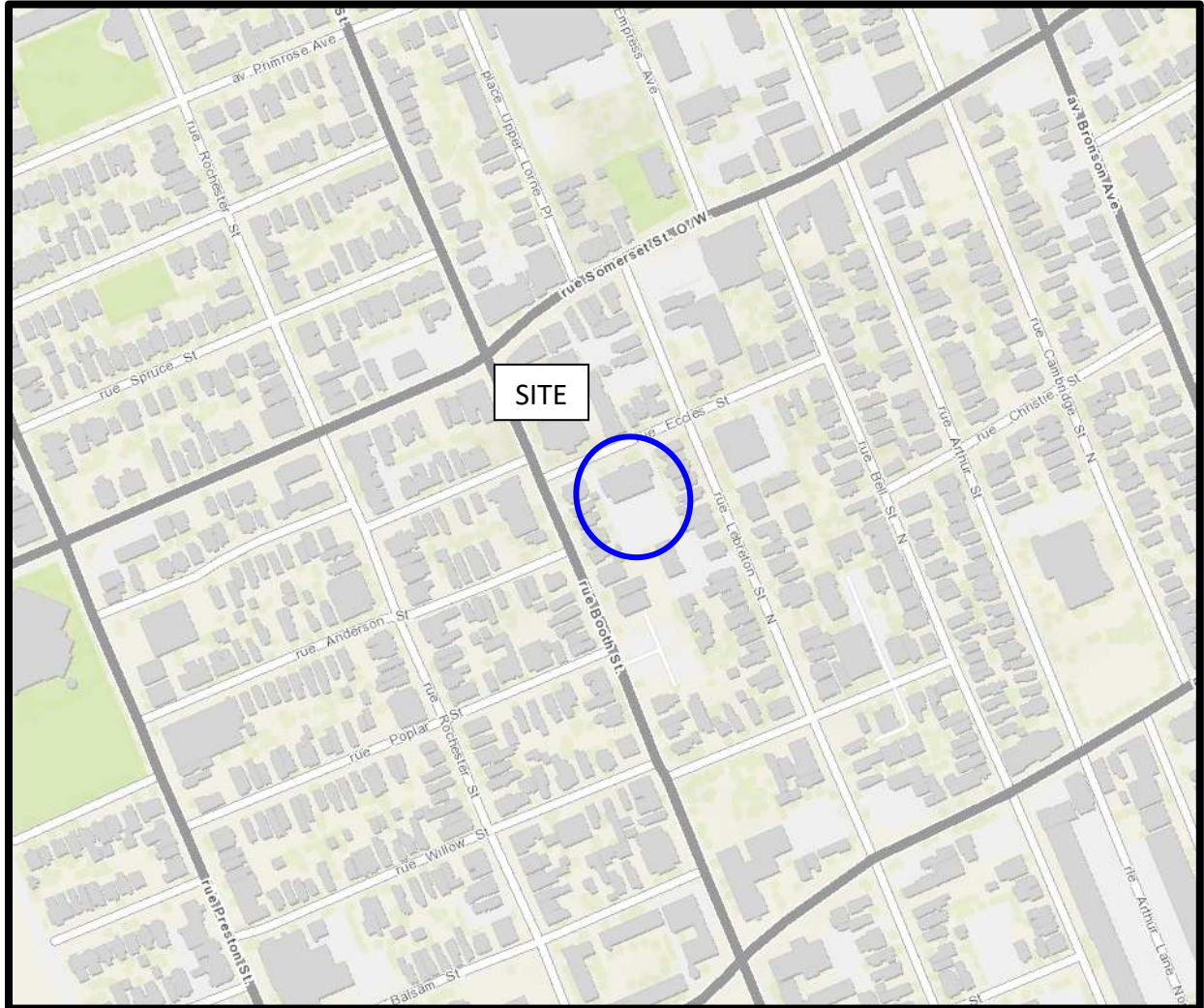
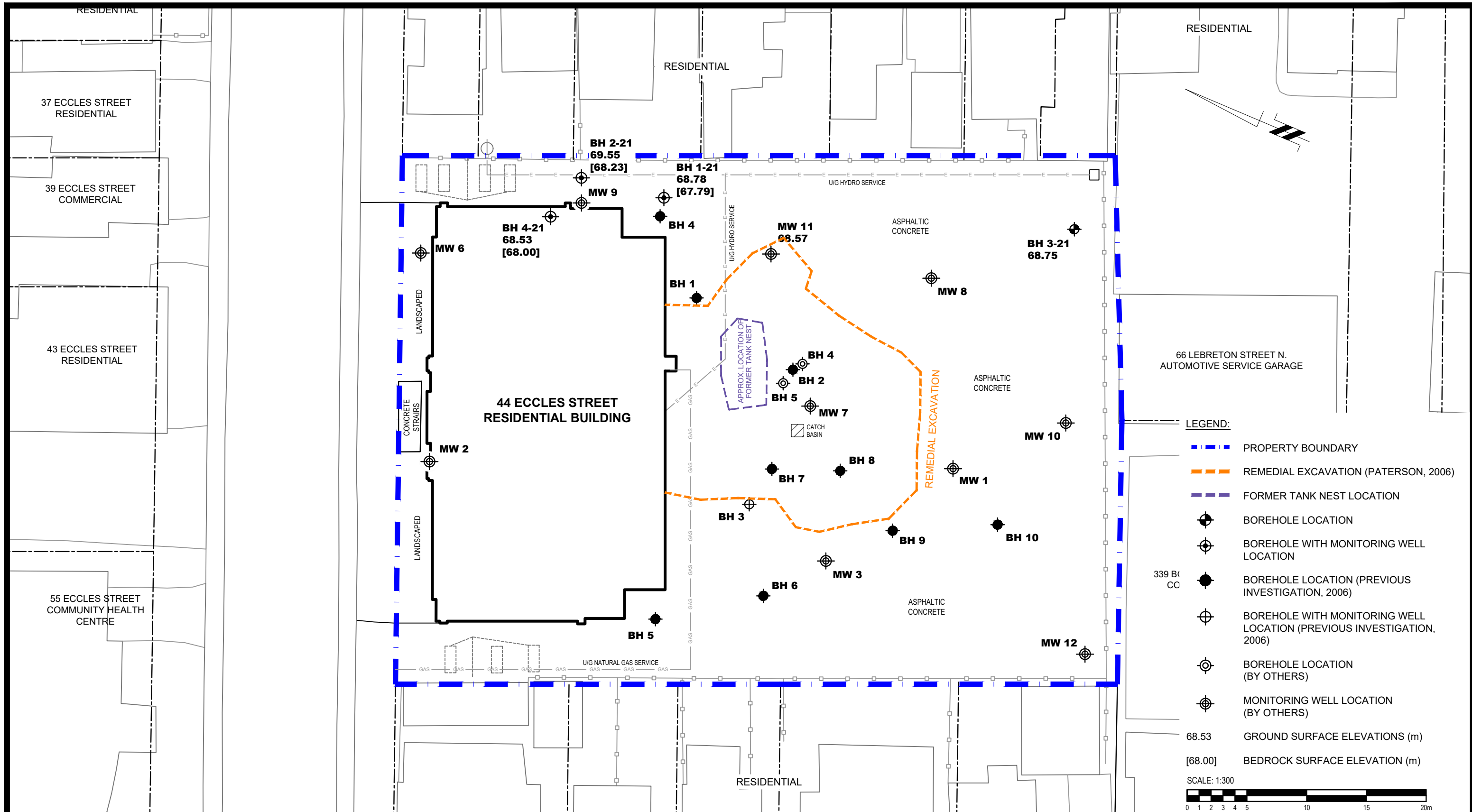


Figure 1:  
KEY PLAN



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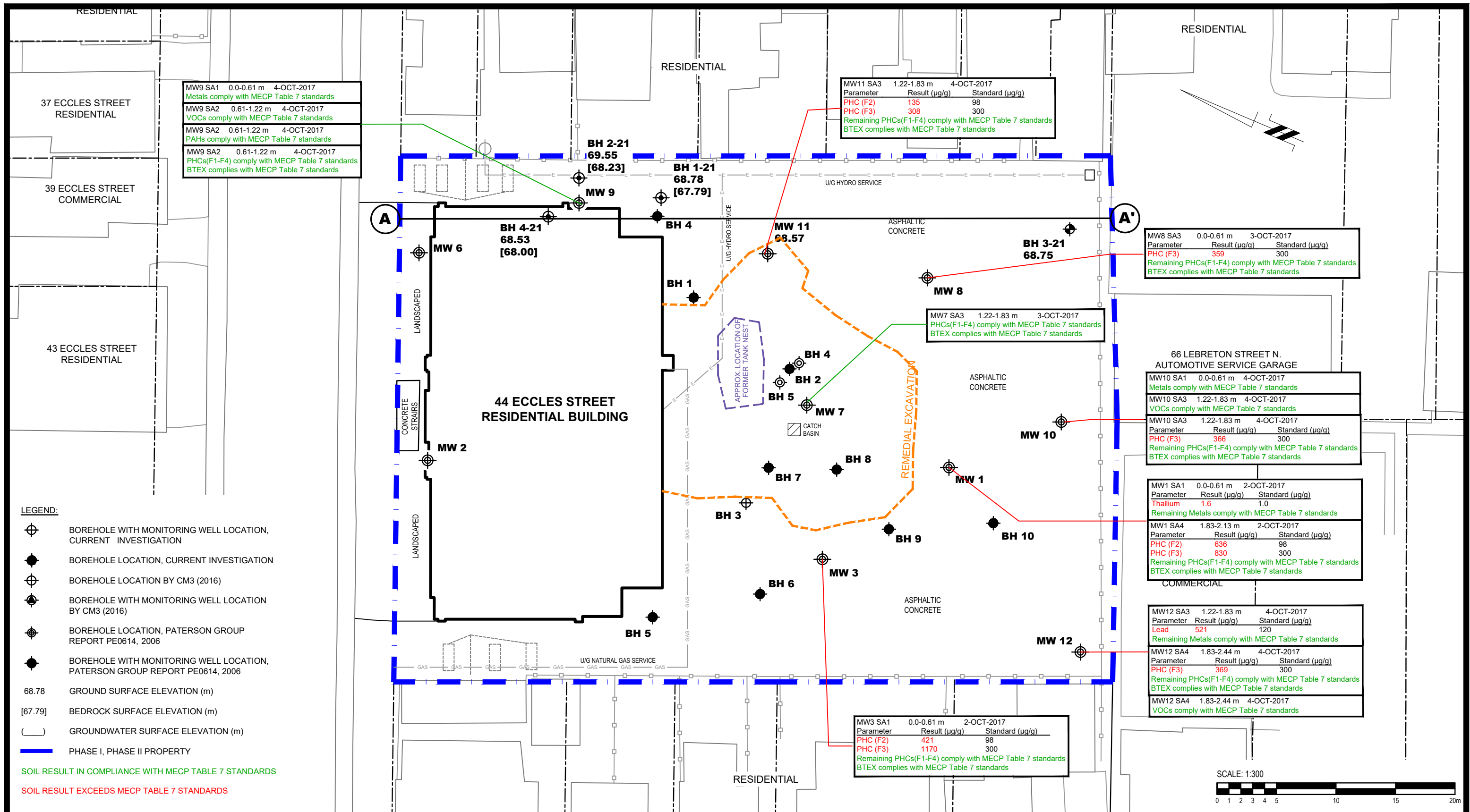
**CORNERSTONE HOUSING FOR WOMEN  
PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE  
44 ECCLES STREET**

OTTAWA, ONTARIO

**TEST HOLE LOCATION PLAN**

|              |       |               |                 |
|--------------|-------|---------------|-----------------|
| Scale:       | 1:300 | Date:         | 10/2021         |
| Drawn by:    | RCG   | Report No.:   | PE5434-1        |
| Checked by:  | JA    | Dwg. No.:     | <b>PE5434-3</b> |
| Approved by: | MB    | Revision No.: |                 |

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**LEGEND:**

- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION BY CM3 (2016)
- BOREHOLE WITH MONITORING WELL LOCATION BY CM3 (2016)
- BOREHOLE LOCATION, PATERSON GROUP REPORT PE0614, 2006
- BOREHOLE WITH MONITORING WELL LOCATION, PATERSON GROUP REPORT PE0614, 2006
- 68.78 GROUND SURFACE ELEVATION (m)
- [67.79] BEDROCK SURFACE ELEVATION (m)
- ( ) GROUNDWATER SURFACE ELEVATION (m)
- PHASE I, PHASE II PROPERTY

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

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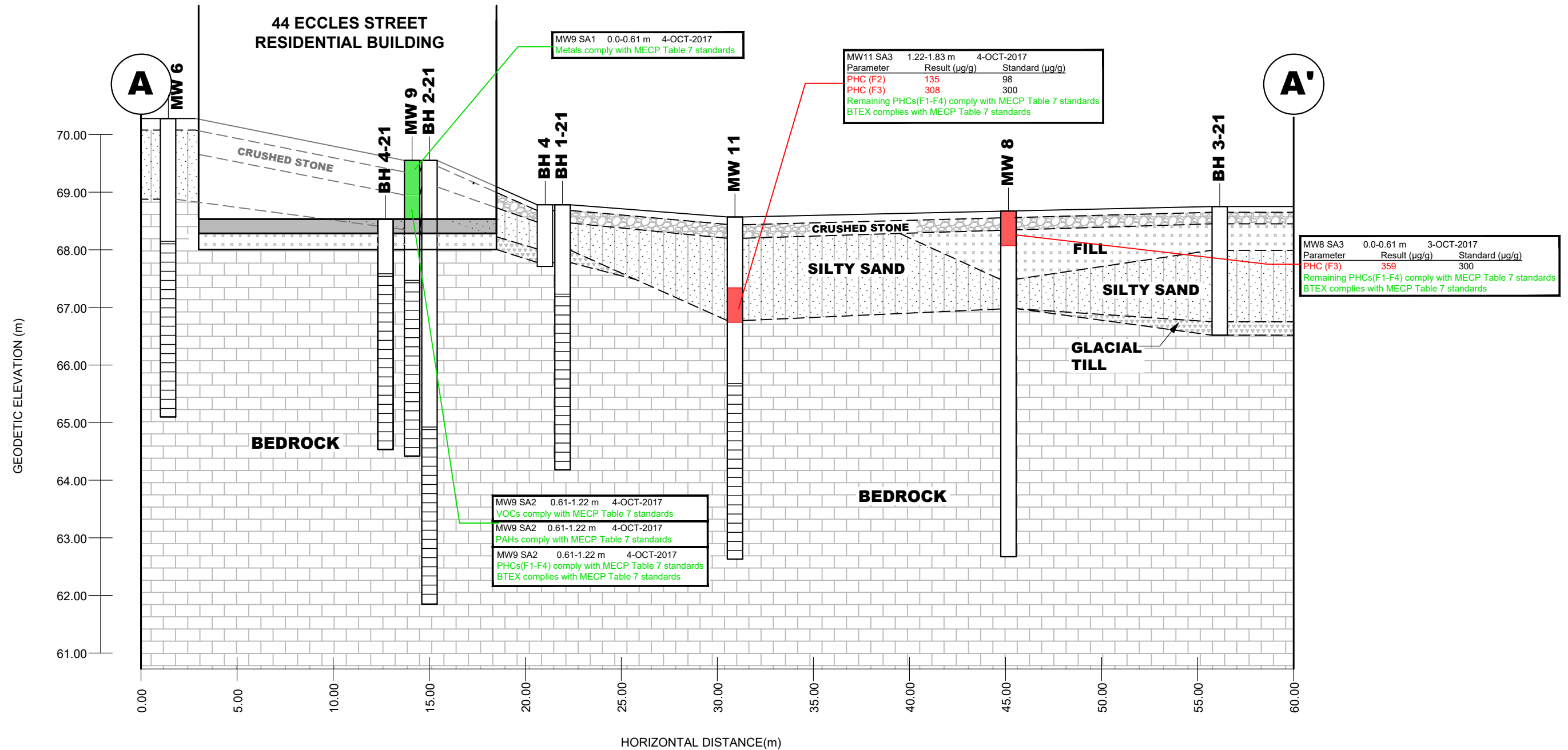
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**CORNERSTONE HOUSING FOR WOMEN  
PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE  
44 ECCLES STREET**

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**ANALYTICAL TESTING PLAN - SOIL**

|              |       |               |                 |
|--------------|-------|---------------|-----------------|
| Scale:       | 1:300 | Date:         | 12/2021         |
| Drawn by:    | RCG   | Report No.:   | PE5434-1        |
| Checked by:  | JA    | Dwg. No.:     | <b>PE5434-4</b> |
| Approved by: | MB    | Revision No.: |                 |



**LEGEND:**  
 SOIL RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS  
 SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

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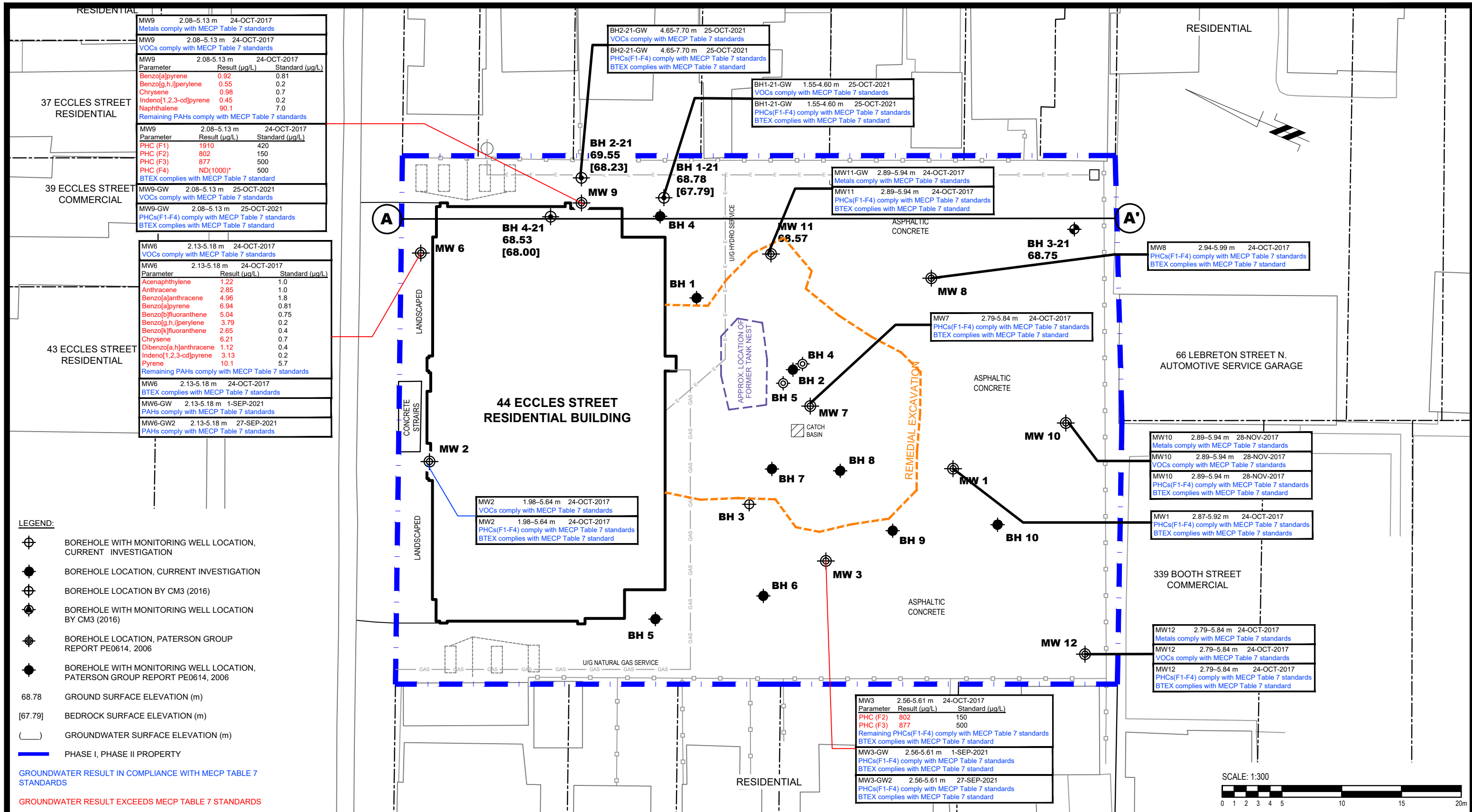
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Title: **CROSS SECTION A-A' - SOIL**

|              |          |               |                  |
|--------------|----------|---------------|------------------|
| Scale:       | AS SHOWN | Date:         | 12/2021          |
| Drawn by:    | RCG      | Report No.:   | PE5434-1         |
| Checked by:  | JA       | Dwg. No.:     | <b>PE5434-4A</b> |
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**ANALYTICAL TESTING PLAN - GROUNDWATER**

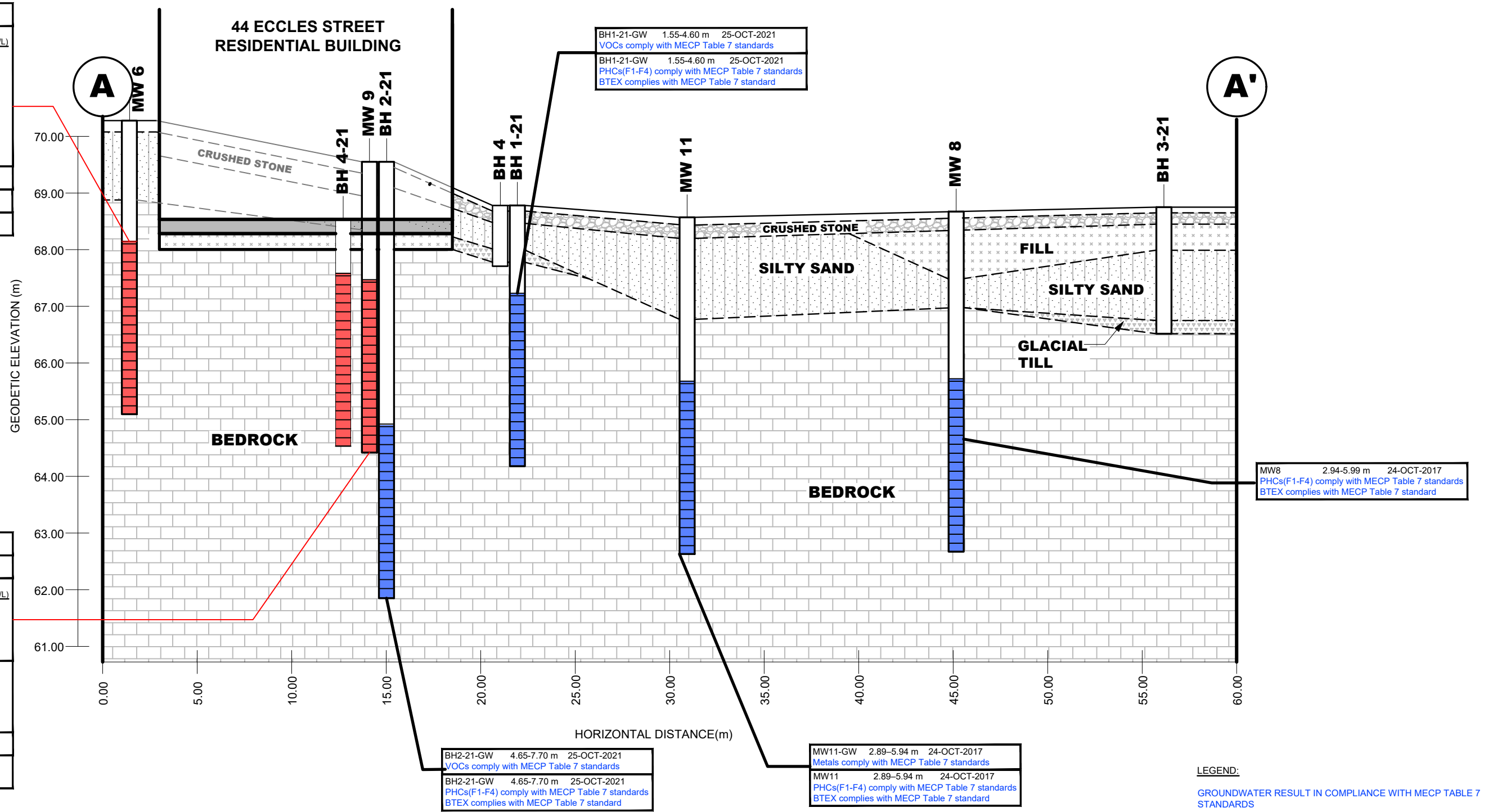
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| Scale: 1:300    | Date: 12/2021             |
| Drawn by: RCG   | Report No.: PE5434-1      |
| Checked by: JA  | Dwg. No.: <b>PE5434-5</b> |
| Approved by: MB | Revision No.:             |

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|         |             |             |   |               |
|---------|-------------|-------------|---|---------------|
| MW6     | 2.13-5.18 m | 24-OCT-2017 | VOCs comply with MECP Table 7 standards           |               |
| MW6     | 2.13-5.18 m | 24-OCT-2017 | Parameter   | Result (µg/L) |
|         |             |             | Standard (µg/L)                                   |               |
|         |             |             | Acenaphthylene                                    | 1.22          |
|         |             |             | Anthracene  | 2.85          |
|         |             |             | Benzo[a]anthracene                                | 4.96          |
|         |             |             | Benzo[a]pyrene                                    | 6.94          |
|         |             |             | Benzo[b]fluoranthene                              | 5.04          |
|         |             |             | Benzo[g,h,i]perylene                              | 3.79          |
|         |             |             | Benzo[k]fluoranthene                              | 2.65          |
|         |             |             | Chrysene  | 6.21          |
|         |             |             | Dibenzo[a,h]anthracene                            | 1.12          |
|         |             |             | Indeno[1,2,3-cd]pyrene                            | 3.13          |
|         |             |             | Pyrene  | 10.1          |
|         |             |             | Remaining PAHs comply with MECP Table 7 standards |               |
| MW6     | 2.13-5.18 m | 24-OCT-2017 | BTEX complies with MECP Table 7 standards         |               |
| MW6-GW  | 2.13-5.18 m | 1-SEP-2021  | PAHs comply with MECP Table 7 standards           |               |
| MW6-GW2 | 2.13-5.18 m | 27-SEP-2021 | PAHs comply with MECP Table 7 standards           |               |

|        |             |             |   |               |
|--------|-------------|-------------|---|---------------|
| MW9    | 2.08-5.13 m | 24-OCT-2017 | Metals comply with MECP Table 7 standards         |               |
| MW9    | 2.08-5.13 m | 24-OCT-2017 | VOCs comply with MECP Table 7 standards           |               |
| MW9    | 2.08-5.13 m | 24-OCT-2017 | Parameter   | Result (µg/L) |
|        |             |             | Standard (µg/L)                                   |               |
|        |             |             | Benzo[a]pyrene                                    | 0.92          |
|        |             |             | Benzo[g,h,i]perylene                              | 0.55          |
|        |             |             | Chrysene  | 0.98          |
|        |             |             | Indeno[1,2,3-cd]pyrene                            | 0.45          |
|        |             |             | Naphthalene                                       | 90.1          |
|        |             |             | Remaining PAHs comply with MECP Table 7 standards |               |
| MW9    | 2.08-5.13 m | 24-OCT-2017 | Parameter   | Result (µg/L) |
|        |             |             | Standard (µg/L)                                   |               |
|        |             |             | PHC (F1)  | 1910          |
|        |             |             | PHC (F2)  | 802           |
|        |             |             | PHC (F3)  | 877           |
|        |             |             | PHC (F4)  | ND(1000)*     |
|        |             |             | BTEX complies with MECP Table 7 standard          |               |
| MW9-GW | 2.08-5.13 m | 25-OCT-2021 | VOCs comply with MECP Table 7 standards           |               |
| MW9-GW | 2.08-5.13 m | 25-OCT-2021 | PHCs(F1-F4) comply with MECP Table 7 standards    |               |
|        |             |             | BTEX complies with MECP Table 7 standard          |               |



**LEGEND:**  
 GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS  
 GROUNDWATER RESULT EXCEEDS MECP TABLE 7 STANDARDS

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**CORNERSTONE HOUSING FOR WOMEN  
 PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE  
 44 ECCLES STREET**

OTTAWA, ONTARIO

**CROSS SECTION A-A' - GROUNDWATER**

|              |          |               |                  |
|--------------|----------|---------------|------------------|
| Scale:       | AS SHOWN | Date:         | 12/2021          |
| Drawn by:    | RCG      | Report No.:   | PE5434-1         |
| Checked by:  | JA       | Dwg. No.:     | <b>PE5434-5A</b> |
| Approved by: | MB       | Revision No.: |                  |

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# **APPENDIX 1**

**SOIL PROFILE AND TEST DATA SHEETS**

**SYMBOLS AND TERMS**

**ANALYTICAL TABLES**

**LABORATORY CERTIFICATES OF ANALYSIS**

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE October 21, 2021

FILE NO. **PE5434**

HOLE NO. **BH 1-21**

| 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   | 0.05        |        |        |            |                | 0         | 68.78     |                               |                           |    |    |                              |
| FILL: Crushed stone  | 0.30        |        |        |            |                |           |           |                               |                           |    |    |                              |
| FILL: Brown silty sand, some clay, trace gravel                              | 0.76        | AU     | 1      |            |                |           |           |                               |                           |    |    |                              |
| GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders | 0.99        | SS     | 2      | 14         | 50+            | 1         | 67.78     |                               |                           |    |    |                              |
|  |             | RC     | 1      | 100        | 33             |           |           |                               |                           |    |    |                              |
|  |             |        |        |            |                | 2         | 66.78     |                               |                           |    |    |                              |
|  |             | RC     | 2      | 100        | 75             |           |           |                               |                           |    |    |                              |
| BEDROCK: Poor to good quality, grey limestone                                |             |        |        |            |                | 3         | 65.78     |                               |                           |    |    |                              |
|  |             | RC     | 3      | 100        | 87             |           |           |                               |                           |    |    |                              |
|  |             |        |        |            |                | 4         | 64.78     |                               |                           |    |    |                              |
| End of Borehole  | 4.60        |        |        |            |                |           |           |                               |                           |    |    |                              |

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

## SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment  
44 Eccles Street  
Ottawa, Ontario

DATUM Geodetic

FILE NO. **PE5434**

REMARKS

HOLE NO. **BH 2-21**

BORINGS BY CME-55 Low Clearance Drill

DATE October 21, 2021

| SOIL DESCRIPTION   | STRATA PLOT | SAMPLE |        |            |                | DEPTH (m) | ELEV. (m) | Photo Ionization Detector  |    |    |  | Monitoring Well Construction |
|--|-------------|--------|--------|------------|----------------|-----------|-----------|--|----|----|--|------------------------------|
|  |             | TYPE   | NUMBER | RECOVERY % | N VALUE or RQD |           |           | <input type="radio"/> Volatile Organic Rdg. (ppm)<br><input type="radio"/> Lower Explosive Limit % |    |    |  |                              |
| GROUND SURFACE   |             |        |        |            |                |           | 20        | 40   | 60 | 80 |  |                              |
| Asphaltic concrete   | 0.10        |        |        |            |                | 0         | 69.55     |  |    |    |  |                              |
| FILL: Crushed stone  | 0.46        | AU     | 1      |            |                |           |           |  |    |    |  |                              |
| FILL: Brown silty sand, some clay, trace gravel                        | 0.91        | SS     | 2      | 18         | 50+            | 1         | 68.55     |  |    |    |  |                              |
| GLACIAL TILL: Dense, brown isly sand with gravel, cobbles and boulders | 1.32        | RC     | 1      | 100        | 82             |           |           |  |    |    |  |                              |
|  |             | RC     | 2      | 100        | 70             | 2         | 67.55     |  |    |    |  |                              |
|  |             | RC     | 3      | 100        | 95             | 4         | 65.55     |  |    |    |  |                              |
| <b>BEDROCK:</b> Good to excellent quality, grey limestone              |             | RC     | 4      | 100        | 93             | 5         | 64.55     |  |    |    |  |                              |
|  |             | RC     | 5      | 100        | 96             | 7         | 62.55     |  |    |    |  |                              |
| End of Borehole  | 7.70        |        |        |            |                |           |           |  |    |    |  |                              |

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

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE October 21, 2021

FILE NO. **PE5434**

HOLE NO. **BH 3-21**

| 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         |        |        |            |                | 0         | 68.75     |                               |                           |    |    |                              |
| FILL: Crushed stone  | 0.30         |        |        |            |                |           |           |                               |                           |    |    |                              |
| FILL: Brown silty sand, trace gravel                                   | 0.76         | AU     | 1      |            |                |           |           |                               |                           |    |    |                              |
| Loose to compact, brown <b>SILTY SAND</b> , trace gravel               |              | SS     | 2      | 0          | 4              | 1         | 67.75     |                               |                           |    |    |                              |
|  |              | SS     | 3      | 29         | 15             |           |           |                               |                           |    |    |                              |
| GLACIAL TILL: Brown/black silty sand with gravel, cobbles and boulders | 1.98<br>2.23 |        |        |            |                | 2         | 66.75     |                               |                           |    |    |                              |
| End of Borehole  |              |        |        |            |                |           |           |                               |                           |    |    |                              |
| Practical refusal to augering at 2.23m depth.                          |              |        |        |            |                |           |           |                               |                           |    |    |                              |

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

DATUM Geodetic

REMARKS

BORINGS BY Portable Drill

DATE November 11, 2021

FILE NO. **PE5434**

HOLE NO. **BH 4-21**

| 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 |                              |  |
| Concrete slab   | 0.25        |        |        |            |                | 0         | 68.53     |                               |                           |    |    |                              |  |
| <b>FILL:</b> Brown silty sand with crushed stone, gravel and cobbles                                  | 0.53        | AU     | 1      |            |                |           |           |                               |                           |    |    |                              |  |
| <b>BEDROCK:</b> Fair to excellent quality, grey limestone<br><br>- 12mm thick mud seam at 1.65m depth |             | RC     | 1      | 95         | 64             | 1         | 67.53     |                               |                           |    |    |                              |  |
|   |             | RC     | 2      | 100        | 65             | 2         | 66.53     |                               |                           |    |    |                              |  |
|   |             | RC     | 3      | 100        | 94             | 3         | 65.53     |                               |                           |    |    |                              |  |
| End of Borehole   | 4.01        |        |        |            |                | 4         | 64.53     |                               |                           |    |    |                              |  |

100 200 300 400 500

**RKI Eagle Rdg. (ppm)**

▲ Full Gas Resp. △ Methane Elim.

| Parameter        | Units    | MDL | Regulation   | MW1 SA1  | MW12 SA3  | MW10 SA1 | MW9 SA1  |
|------------------|----------|-----|--|----------|-----------|----------|----------|
| Sample Depth (m) |          |     | Reg 153/04 (2011) - Table<br>7 Residential, Coarse | 0.0-0.61 | 1.22-1.83 | 0.0-0.61 | 0.0-0.61 |
| Sample Date      |          |     |  | 2-Oct-17 | 4-Oct-17  | 4-Oct-17 | 4-Oct-17 |
| <b>Metals</b>    |          |     |  |          |           |          |          |
| Antimony         | ug/g dry | 1.0 | 7.5 ug/g dry                                       | ND (1.0) | 2         | ND (1.0) | ND (1.0) |
| Arsenic          | ug/g dry | 1.0 | 18 ug/g dry  | 3.7      | 12.2      | 2.1      | 3.4      |
| Barium           | ug/g dry | 1.0 | 390 ug/g dry                                       | 67.8     | 258       | 47.1     | 53.6     |
| Beryllium        | ug/g dry | 1.0 | 4 ug/g dry   | ND (1.0) | ND (1.0)  | ND (1.0) | ND (1.0) |
| Boron            | ug/g dry | 1.0 | 120 ug/g dry                                       | 9.7      | 10.8      | 3.7      | 4.9      |
| Cadmium          | ug/g dry | 0.5 | 1.2 ug/g dry                                       | ND (0.5) | ND (0.5)  | ND (0.5) | ND (0.5) |
| Chromium         | ug/g dry | 1.0 | 160 ug/g dry                                       | 11.2     | 18.1      | 18.4     | 15.6     |
| Cobalt           | ug/g dry | 1.0 | 22 ug/g dry  | 3.5      | 7         | 4.6      | 10.2     |
| Copper           | ug/g dry | 1.0 | 140 ug/g dry                                       | 9.5      | 49.8      | 13.5     | 11.2     |
| Lead             | ug/g dry | 1.0 | 120 ug/g dry                                       | 35.8     | 521       | 29.1     | 27.9     |
| Molybdenum       | ug/g dry | 1.0 | 6.9 ug/g dry                                       | ND (1.0) | 1.3       | ND (1.0) | 2        |
| Nickel           | ug/g dry | 1.0 | 100 ug/g dry                                       | 9.7      | 16        | 10.4     | 19.3     |
| Selenium         | ug/g dry | 1.0 | 2.4 ug/g dry                                       | ND (1.0) | ND (1.0)  | ND (1.0) | ND(1.0)  |
| Silver           | ug/g dry | 0.5 | 20 ug/g dry  | ND (0.5) | ND (0.5)  | ND (0.5) | 0.6      |
| Thallium         | ug/g dry | 1.0 | 1.0 ug/g dry                                       | 1.6      | ND (1.0)  | ND (1.0) | ND (1.0) |
| Uranium          | ug/g dry | 1.0 | 23 ug/g dry  | ND (1.0) | ND (1.0)  | ND (1.0) | ND (1.0) |
| Vanadium         | ug/g dry | 1.0 | 86 ug/g dry  | 17.7     | 25.2      | 20.6     | 14       |
| Zinc             | ug/g dry | 1.0 | 340 ug/g dry                                       | 35       | 121       | 52.6     | 22.8     |

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                                 | MW12      | MW10      | MW9       | MW11-GW   |
|---------------------|-------|-----|--|-----------|-----------|-----------|-----------|
| Screen Interval (m) |       |     | Table 7 Non-Potable<br>Groundwater, Coarse | 2.79-5.84 | 2.89-5.94 | 2.08-5.13 | 2.89-5.94 |
| Sample Date         |       |     |  | 24-Oct-17 | 28-Nov-17 | 24-Oct-17 | 1-Sep-21  |
| <b>Metals</b>       |       |     |  |           |           |           |           |
| Antimony            | ug/L  | 0.5 | 16000 ug/L                                 | ND (0.5)  | ND (0.5)  | ND (0.5)  | 0.7       |
| Arsenic             | ug/L  | 1   | 1500 ug/L                                  | 7         | ND (1)    | ND (1)    | 2         |
| Barium              | ug/L  | 1   | 23000 ug/L                                 | 726       | 726       | 901       | 320       |
| Beryllium           | ug/L  | 0.5 | 53 ug/L                                    | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  |
| Boron               | ug/L  | 10  | 36000 ug/L                                 | 138       | 394       | 139       | 431       |
| Cadmium             | ug/L  | 0.1 | 2.1 ug/L                                   | ND (0.1)  | ND (0.1)  | ND (0.1)  | ND (0.1)  |
| Chromium            | ug/L  | 1   | 640 ug/L                                   | ND (1)    | ND (1)    | ND (1)    | ND (1)    |
| Cobalt              | ug/L  | 0.5 | 52 ug/L                                    | 3.4       | 0.5       | 3.3       | ND (0.5)  |
| Copper              | ug/L  | 0.5 | 69 ug/L                                    | ND (0.5)  | ND (0.5)  | ND (0.5)  | 0.9       |
| Lead                | ug/L  | 0.1 | 20 ug/L                                    | 0.2       | ND (0.1)  | ND (0.1)  | 0.2       |
| Molybdenum          | ug/L  | 0.5 | 7300 ug/L                                  | 3.1       | 0.5       | 0.6       | 5.4       |
| Nickel              | ug/L  | 1   | 390 ug/L                                   | 2         | 1         | 3         | 2         |
| Selenium            | ug/L  | 1   | 50 ug/L                                    | ND (1)    | ND (1)    | ND (1)    | ND (1)    |
| Silver              | ug/L  | 0.1 | 1.2 ug/L                                   | ND (0.1)  | ND (0.1)  | ND (0.1)  | ND (0.1)  |
| Sodium              | ug/L  | 200 | 1800000 ug/L                               | 1270000   | 1090000   | 936000    | 3120000   |
| Thallium            | ug/L  | 0.1 | 400 ug/L                                   | ND (0.1)  | ND (0.1)  | 0.1       | ND (0.1)  |
| Uranium             | ug/L  | 0.1 | 330 ug/L                                   | 1.9       | 1.5       | 4.1       | 3.5       |
| Vanadium            | ug/L  | 0.5 | 200 ug/L                                   | 4.5       | ND (0.5)  | ND (0.5)  | 0.9       |
| Zinc                | ug/L  | 5   | 890 ug/L                                   | 7         | ND (5)    | 11        | 7         |

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit



| Parameter                   | Units    | MDL  | Regulation   | MW12 SA4  |
|-----------------------------|----------|------|--|-----------|
| Sample Depth (m)            |          |      | Reg 153/04 (2011) - Table<br>7 Residential, Coarse | 1.83-2.44 |
| Sample Date                 |          |      |  | 4-Oct-17  |
| <b>Volatiles</b>            |          |      |  |           |
| Acetone                     | ug/g dry | 0.50 | 16 ug/g dry  | ND (0.50) |
| Benzene                     | ug/g dry | 0.02 | 0.21 ug/g dry                                      | ND (0.02) |
| Bromodichloromethane        | ug/g dry | 0.05 | 13 ug/g dry  | ND (0.05) |
| Bromoform                   | ug/g dry | 0.05 | 0.27 ug/g dry                                      | ND (0.05) |
| Bromomethane                | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| Carbon Tetrachloride        | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| Chlorobenzene               | ug/g dry | 0.05 | 2.4 ug/g dry                                       | ND (0.05) |
| Chloroform                  | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| Dibromochloromethane        | ug/g dry | 0.05 | 9.4 ug/g dry                                       | ND (0.05) |
| Dichlorodifluoromethane     | ug/g dry | 0.05 | 16 ug/g dry  | ND (0.05) |
| 1,2-Dichlorobenzene         | ug/g dry | 0.05 | 3.4 ug/g dry                                       | ND (0.05) |
| 1,3-Dichlorobenzene         | ug/g dry | 0.05 | 4.8 ug/g dry                                       | ND (0.05) |
| 1,4-Dichlorobenzene         | ug/g dry | 0.05 | 0.083 ug/g dry                                     | ND (0.05) |
| 1,1-Dichloroethane          | ug/g dry | 0.05 | 3.5 ug/g dry                                       | ND (0.05) |
| 1,2-Dichloroethane          | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| 1,1-Dichloroethylene        | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| cis-1,2-Dichloroethylene    | ug/g dry | 0.05 | 3.4 ug/g dry                                       | ND (0.05) |
| trans-1,2-Dichloroethylene  | ug/g dry | 0.05 | 0.084 ug/g dry                                     | ND (0.05) |
| 1,2-Dichloropropane         | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| cis-1,3-Dichloropropylene   | ug/g dry | 0.05 |  | ND (0.05) |
| trans-1,3-Dichloropropylene | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| 1,3-Dichloropropene, total  | ug/g dry | 0.05 |  | ND (0.05) |
| Ethylbenzene                | ug/g dry | 0.05 | 2 ug/g dry   | ND (0.05) |
| Ethylene dibromide          | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| Hexane                      | ug/g dry | 0.05 | 2.8 ug/g dry                                       | ND (0.05) |
| Methyl Ethyl Ketone         | ug/g dry | 0.50 | 16 ug/g dry  | ND (0.50) |
| Methyl Isobutyl Ketone      | ug/g dry | 0.50 | 1.7 ug/g dry                                       | ND (0.50) |
| Methyl tert-butyl ether     | ug/g dry | 0.05 | 0.75 ug/g dry                                      | ND (0.05) |
| Methylene Chloride          | ug/g dry | 0.05 | 0.1 ug/g dry                                       | ND (0.05) |
| Styrene                     | ug/g dry | 0.05 | 0.7 ug/g dry                                       | ND (0.05) |
| 1,1,1,2-Tetrachloroethane   | ug/g dry | 0.05 | 0.058 ug/g dry                                     | ND (0.05) |
| 1,1,2,2-Tetrachloroethane   | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| Tetrachloroethylene         | ug/g dry | 0.05 | 0.28 ug/g dry                                      | ND (0.05) |
| Toluene                     | ug/g dry | 0.05 | 2.3 ug/g dry                                       | ND (0.05) |
| 1,1,1-Trichloroethane       | ug/g dry | 0.05 | 0.38 ug/g dry                                      | ND (0.05) |
| 1,1,2-Trichloroethane       | ug/g dry | 0.05 | 0.05 ug/g dry                                      | ND (0.05) |
| Trichloroethylene           | ug/g dry | 0.05 | 0.061 ug/g dry                                     | ND (0.05) |
| Trichlorofluoromethane      | ug/g dry | 0.05 | 4 ug/g dry   | ND (0.05) |
| Vinyl Chloride              | ug/g dry | 0.02 | 0.02 ug/g dry                                      | ND (0.02) |
| m/p-Xylene                  | ug/g dry | 0.05 |  | ND (0.05) |
| o-Xylene                    | ug/g dry | 0.05 | 3.1 ug/g dry                                       | ND (0.05) |
| Xylenes, total              | ug/g dry | 0.05 |  | ND (0.05) |

ND (0.5)

No concentrations identified above the MDL

MDL

Method Detection Limit

| Parameter                   | Units | MDL | Regulation                                 | MW12      | MW10      | MW2       | MW6       | MW9       | BH1-21-GW | BH2-21-GW | MW9-GW    |
|-----------------------------|-------|-----|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Screen Interval (m)         |       |     | Table 7 Non-Potable<br>Groundwater, Coarse | 2.79-5.84 | 2.89-5.94 | 1.98-5.64 | 2.13-5.18 | 2.08-5.13 | 1.55-4.60 | 4.65-7.70 | 2.08-5.13 |
| Sample Date                 |       |     |  | 24-Oct-17 | 28-Nov-17 | 24-Oct-17 | 24-Oct-17 | 24-Oct-17 | 25-Oct-21 | 25-Oct-21 | 25-Oct-21 |
| <b>Volatiles</b>            |       |     |  |           |           |           |           |           |           |           |           |
| 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)  |
| Benzene                     | 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| Chloroform                  | ug/L  | 0.5 | 2 ug/L                                     | ND (0.5)  | ND (0.5)  | ND (0.5)  | 1.8       | ND (0.5)  | ND (0.5)  | 0.5       | 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| trans-1,3-Dichloropropylene | 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)  |
| 1,3-Dichloropropene, total  | 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)  |
| Ethylbenzene                | ug/L  | 0.5 | 54 ug/L                                    | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | 27.2      | ND (0.5)  | 1.9       | 0.7       |
| 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)  |
| 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)  | 2         | 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)  |
| Methyl Isobutyl Ketone      | ug/L  | 5.0 | 5200 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| Toluene                     | ug/L  | 0.5 | 320 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| 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)  |
| m/p-Xylene                  | ug/L  | 0.5 |  | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | 20.2      | ND (0.5)  | 0.9       | 0.5       |
| o-Xylene                    | ug/L  | 0.5 | 72 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)  |
| Xylenes, total              | ug/L  | 0.5 |  | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | 20.2      | ND (0.5)  | 0.9       | 0.5       |

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  | MW9 SA2   |
|-------------------------|----------|------|---|-----------|
| Sample Depth (m)        |          |      | Reg 153/04 (2011) -<br>Table 7 Residential,<br>Coarse | 0.61-1.22 |
| Sample Date             |          |      |   | 4-Oct-17  |
| <b>Semi-Volatiles</b>   |          |      |   |           |
| Acenaphthene            | ug/g dry | 0.02 | 7.9 ug/g dry  | ND (0.02) |
| Acenaphthylene          | ug/g dry | 0.02 | 0.15 ug/g dry   | ND (0.02) |
| Anthracene              | ug/g dry | 0.02 | 0.67 ug/g dry   | ND (0.02) |
| Benzo[a]anthracene      | ug/g dry | 0.02 | 0.5 ug/g dry  | ND (0.02) |
| Benzo[a]pyrene          | ug/g dry | 0.02 | 0.3 ug/g dry  | ND (0.02) |
| Benzo[b]fluoranthene    | ug/g dry | 0.02 | 0.78 ug/g dry   | ND (0.02) |
| Benzo[g,h,i]perylene    | ug/g dry | 0.02 | 6.6 ug/g dry  | ND (0.02) |
| Benzo[k]fluoranthene    | ug/g dry | 0.02 | 0.78 ug/g dry   | ND (0.02) |
| Chrysene                | ug/g dry | 0.02 | 7 ug/g dry  | ND (0.02) |
| Dibenzo[a,h]anthracene  | ug/g dry | 0.02 | 0.1 ug/g dry  | ND (0.02) |
| Fluoranthene            | ug/g dry | 0.02 | 0.69 ug/g dry   | 0.03      |
| Fluorene                | ug/g dry | 0.02 | 62 ug/g dry   | ND (0.02) |
| Indeno[1,2,3-cd]pyrene  | ug/g dry | 0.02 | 0.38 ug/g dry   | ND (0.02) |
| 1-Methylnaphthalene     | ug/g dry | 0.02 | 0.99 ug/g dry   | ND (0.02) |
| 2-Methylnaphthalene     | ug/g dry | 0.02 | 0.99 ug/g dry   | ND (0.02) |
| Methylnaphthalene (1&2) | ug/g dry | 0.04 | 0.99 ug/g dry   | ND (0.04) |
| Naphthalene             | ug/g dry | 0.01 | 0.6 ug/g dry  | ND (0.01) |
| Phenanthrene            | ug/g dry | 0.02 | 6.2 ug/g dry  | ND (0.02) |
| Pyrene                  | ug/g dry | 0.02 | 78 ug/g dry   | 0.03      |

ND (0.5)

No concentrations identified above the MDL

MDL

Method Detection Limit

| Parameter               | Units | MDL  | Regulation          | MW6       | MW9        | MW6-GW    | MW6-GW2   |
|-------------------------|-------|------|---------------------|-----------|------------|-----------|-----------|
| Screen Interval (m)     |       |      | Table 7 Non-Potable | 2.13-5.18 | 2.08-5.13  | 2.13-5.18 | 2.13-5.18 |
| Sample Date             |       |      | Groundwater, Coarse | 24-Oct-17 | 24-Oct-17  | 1-Sep-21  | 27-Sep-21 |
| <b>Semi-Volatiles</b>   |       |      |                     |           |            |           |           |
| Acenaphthene            | ug/L  | 0.05 | 17 ug/L             | 0.99      | 10.9       | ND (0.05) | ND (0.05) |
| Acenaphthylene          | ug/L  | 0.05 | 1 ug/L              | 1.22      | ND (0.25)* | ND (0.05) | ND (0.05) |
| Anthracene              | ug/L  | 0.01 | 1 ug/L              | 2.85      | 0.56       | ND (0.01) | ND (0.01) |
| Benzo[a]anthracene      | ug/L  | 0.01 | 1.8 ug/L            | 4.96      | 0.74       | ND (0.01) | ND (0.01) |
| Benzo[a]pyrene          | ug/L  | 0.01 | 0.81 ug/L           | 6.94      | 0.92       | ND (0.01) | ND (0.01) |
| Benzo[b]fluoranthene    | ug/L  | 0.05 | 0.75 ug/L           | 5.04      | 0.72       | ND (0.05) | ND (0.05) |
| Benzo[g,h,i]perylene    | ug/L  | 0.05 | 0.2 ug/L            | 3.79      | 0.55       | ND (0.05) | ND (0.05) |
| Benzo[k]fluoranthene    | ug/L  | 0.05 | 0.4 ug/L            | 2.65      | 0.36       | ND (0.05) | ND (0.05) |
| Chrysene                | ug/L  | 0.05 | 0.7 ug/L            | 6.21      | 0.98       | ND (0.05) | ND (0.05) |
| Dibenzo[a,h]anthracene  | ug/L  | 0.05 | 0.4 ug/L            | 1.12      | ND (0.25)* | ND (0.05) | ND (0.05) |
| Fluoranthene            | ug/L  | 0.01 | 44 ug/L             | 11.1      | 32.22      | ND (0.01) | ND (0.01) |
| Fluorene                | ug/L  | 0.05 | 290 ug/L            | 0.95      | 8.12       | ND (0.05) | ND (0.05) |
| Indeno[1,2,3-cd]pyrene  | ug/L  | 0.05 | 0.2 ug/L            | 3.13      | 0.45       | ND (0.05) | ND (0.05) |
| 1-Methylnaphthalene     | ug/L  | 0.05 | 1500 ug/L           | 0.36      | 478        | ND (0.05) | 0.12      |
| 2-Methylnaphthalene     | ug/L  | 0.05 | 1500 ug/L           | 0.43      | 503        | ND (0.05) | 0.05      |
| Methylnaphthalene (1&2) | ug/L  | 0.10 | 1500 ug/L           | 0.79      | 981        | ND (0.10) | 0.17      |
| Naphthalene             | ug/L  | 0.05 | 7 ug/L              | 0.5       | 90.1       | ND (0.05) | ND (0.05) |
| Phenanthrene            | ug/L  | 0.05 | 380 ug/L            | 9.28      | 5.75       | ND (0.05) | ND (0.05) |
| Pyrene                  | ug/L  | 0.01 | 5.7 ug/L            | 10.1      | 1.84       | ND (0.01) | ND (0.01) |

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   | MW1 SA4   | MW3 SA1   | MW7 SA3   | MW8 SA3   | MW11 SA3  | MW12 SA4  | MW10 SA3  | MW9 SA2   |
|------------------------|----------|------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Sample Depth (m)       |          |      | Reg 153/04 (2011) - Table 7<br>Residential, Coarse | 1.83-2.13 | 0.0-0.61  | 1.22-1.83 | 1.22-1.68 | 1.22-1.83 | 1.83-2.44 | 1.22-1.83 | 0.61-1.22 |
| Sample Date            |          |      |  | 2-Oct-17  | 2-Oct-17  | 3-Oct-17  | 3-Oct-17  | 4-Oct-17  | 4-Oct-17  | 4-Oct-17  | 4-Oct-17  |
| <b>BTEX</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 |  | 0.7       | 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                                       | 0.7       | 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  | 11        | 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  | 636       | 421       | 24        | ND (40)*  | 135       | ND (40)*  | 11        | ND (4)    |
| F3 PHCs (C16-C34)      | ug/g dry | 8    | 300 ug/g dry                                       | 830       | 1170      | 259       | 359       | 308       | 369       | 366       | 9         |
| F4 PHCs (C34-C50)      | ug/g dry | 6    | 2800 ug/g dry                                      | ND (60)*  | 840       | 314       | 570       | 237       | 719       | 433       | 23        |
| F4G PHCs (gravimetric) | ug/g dry | 50   | 2800 ug/g dry                                      | ND (60)   | 840       | 368       | NA        | NA        | NA        | 401       | NA        |

2 Sample exceeds MECP Table 7 Residential Coarse Grained Standard

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit

| Parameter           | Units | MDL | Regulation                                 | MW1       | MW3       | MW7       | MW8       | MW11      | MW12      | MW10      | MW2       | MW6       | MW9        |
|---------------------|-------|-----|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Screen Interval (m) |       |     | Table 7 Non-Potable<br>Groundwater, Coarse | 2.87-5.92 | 2.56-5.61 | 2.79-5.84 | 2.94-5.99 | 2.89-5.94 | 2.79-5.84 | 2.89-5.94 | 1.98-5.64 | 2.13-5.18 | 2.08-5.13  |
| Sample Date         |       |     |  | 24-Oct-17 | 24-Oct-17 | 24-Oct-17 | 24-Oct-17 | 24-Oct-17 | 24-Oct-17 | 24-Oct-17 | 28-Nov-17 | 24-Oct-17 | 24-Oct-17  |
| <b>BTEX</b>         |       |     |  |           |           |           |           |           |           |           |           |           |            |
| Benzene             | 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)   |
| Ethylbenzene        | ug/L  | 0.5 | 54 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)  | 27.2       |
| Toluene             | ug/L  | 0.5 | 320 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)   |
| m/p-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)  | 20.2       |
| 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)   |
| Xylenes, total      | ug/L  | 0.5 | 72 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)  | 20.2       |
| <b>Hydrocarbons</b> |       |     |  |           |           |           |           |           |           |           |           |           |            |
| F1 PHCs (C6-C10)    | ug/L  | 25  | 420 ug/L                                   | ND (25)   | ND (25)   | ND (25)   | ND (25)   | ND (25)   | ND (25)   | ND (25)   | ND (25)   | NA        | 1910       |
| F2 PHCs (C10-C16)   | ug/L  | 100 | 150 ug/L                                   | ND (100)  | 802       | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | NA        | 72500      |
| F3 PHCs (C16-C34)   | ug/L  | 100 | 500 ug/L                                   | ND (100)  | 877       | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | NA        | 1520       |
| F4 PHCs (C34-C50)   | ug/L  | 100 | 500 ug/L                                   | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | NA        | ND (1000)* |

ND No concentrations identified above the MDL  
MDL Method Detection Limit

| Parameter           | Units | MDL | Regulation                              | MW3-GW    | MW3-GW2   | BH1-21-GW | BH2-21-GW | MW9-GW    | BH4-21-GW |
|---------------------|-------|-----|---|-----------|-----------|-----------|-----------|-----------|-----------|
| Screen Interval (m) |       |     | Table 7 Non-Potable Groundwater, Coarse | 2.56-5.61 | 2.56-5.61 | 1.55-4.60 | 4.65-7.70 | 2.08-5.13 | 0.96-4.01 |
| Sample Date         |       |     |   | 1-Sep-21  | 27-Sep-21 | 25-Oct-21 | 25-Oct-21 | 25-Oct-21 | 18-Nov-21 |
| <b>BTEX</b>         |       |     |   |           |           |           |           |           |           |
| Benzene             | ug/L  | 0.5 | 0.5 ug/L                                | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | 1.9       |
| Ethylbenzene        | ug/L  | 0.5 | 54 ug/L                                 | ND (0.5)  | ND (0.5)  | ND (0.5)  | 1.9       | 0.7       | 13.5      |
| Toluene             | ug/L  | 0.5 | 320 ug/L                                | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | 0.6       |
| m/p-Xylene          | ug/L  | 0.5 |   | ND (0.5)  | ND (0.5)  | ND (0.5)  | 0.9       | 0.5       | 10        |
| o-Xylene            | ug/L  | 0.5 |   | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | ND (0.5)  | 0.6       |
| Xylenes, total      | ug/L  | 0.5 | 72 ug/L                                 | ND (0.5)  | ND (0.5)  | ND (0.5)  | 0.9       | 0.5       | 10.6      |
| <b>Hydrocarbons</b> |       |     |   |           |           |           |           |           |           |
| F1 PHCs (C6-C10)    | ug/L  | 25  | 420 ug/L                                | ND (25)   | ND (25)   | ND (25)   | ND (25)   | ND (25)   | 346       |
| F2 PHCs (C10-C16)   | ug/L  | 100 | 150 ug/L                                | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | 1700      |
| F3 PHCs (C16-C34)   | ug/L  | 100 | 500 ug/L                                | ND (100)  | ND (100)  | ND (100)  | ND (100)  | 288       | ND (100)  |
| F4 PHCs (C34-C50)   | ug/L  | 100 | 500 ug/L                                | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  | ND (100)  |

ND 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: Mike Beaudoin

Client PO: 32096  
Project: PE5434  
Custody: 132418

Report Date: 26-Oct-2021  
Order Date: 25-Oct-2021

**Order #: 2144126**

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

| Parcel ID  | Client ID |
|------------|-----------|
| 2144126-01 | BH1-21-GW |
| 2144126-02 | BH2-21-GW |
| 2144126-03 | MW9-GW    |

Approved By:



Dale Robertson, BSc  
Laboratory Director



Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

**Analysis Summary Table**

| Analysis                   | Method Reference/Description    | Extraction Date | Analysis Date |
|----------------------------|---------------------------------|-----------------|---------------|
| PHC F1                     | CWS Tier 1 - P&T GC-FID         | 25-Oct-21       | 26-Oct-21     |
| PHCs F2 to F4              | CWS Tier 1 - GC-FID, extraction | 26-Oct-21       | 26-Oct-21     |
| REG 153: VOCs by P&T GC/MS | EPA 624 - P&T GC-MS             | 25-Oct-21       | 26-Oct-21     |

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

|  | Client ID:   | BH1-21-GW       | BH2-21-GW       | MW9-GW          | - |
|--|--------------|-----------------|-----------------|-----------------|---|
|  | Sample Date: | 25-Oct-21 09:25 | 25-Oct-21 09:25 | 25-Oct-21 09:25 | - |
|  | Sample ID:   | 2144126-01      | 2144126-02      | 2144126-03      | - |
|  | MDL/Units    | Water           | Water           | Water           | - |

| Volatiles                                |          |      |      |      |   |
|--|----------|------|------|------|---|
| Acetone                                  | 5.0 ug/L | <5.0 | <5.0 | <5.0 | - |
| Benzene                                  | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Bromodichloromethane                     | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Bromoform                                | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Bromomethane                             | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Carbon Tetrachloride                     | 0.2 ug/L | <0.2 | <0.2 | <0.2 | - |
| Chlorobenzene                            | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Chloroform                               | 0.5 ug/L | <0.5 | 0.5  | <0.5 | - |
| Dibromochloromethane                     | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Dichlorodifluoromethane                  | 1.0 ug/L | <1.0 | <1.0 | <1.0 | - |
| 1,2-Dichlorobenzene                      | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,3-Dichlorobenzene                      | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,4-Dichlorobenzene                      | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,1-Dichloroethane                       | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,2-Dichloroethane                       | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,1-Dichloroethylene                     | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| cis-1,2-Dichloroethylene                 | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| trans-1,2-Dichloroethylene               | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,2-Dichloropropane                      | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| cis-1,3-Dichloropropylene                | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| trans-1,3-Dichloropropylene              | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,3-Dichloropropene, total               | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Ethylbenzene                             | 0.5 ug/L | <0.5 | 1.9  | 0.7  | - |
| Ethylene dibromide (dibromoethane, 1,2-) | 0.2 ug/L | <0.2 | <0.2 | <0.2 | - |
| Hexane                                   | 1.0 ug/L | <1.0 | 2.0  | <1.0 | - |
| Methyl Ethyl Ketone (2-Butanone)         | 5.0 ug/L | <5.0 | <5.0 | <5.0 | - |
| Methyl Isobutyl Ketone                   | 5.0 ug/L | <5.0 | <5.0 | <5.0 | - |
| Methyl tert-butyl ether                  | 2.0 ug/L | <2.0 | <2.0 | <2.0 | - |
| Methylene Chloride                       | 5.0 ug/L | <5.0 | <5.0 | <5.0 | - |
| Styrene                                  | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,1,1,2-Tetrachloroethane                | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,1,2,2-Tetrachloroethane                | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Tetrachloroethylene                      | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| Toluene                                  | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |
| 1,1,1-Trichloroethane                    | 0.5 ug/L | <0.5 | <0.5 | <0.5 | - |

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

|                        | Client ID:   | BH1-21-GW       | BH2-21-GW       | MW9-GW          | - |
|------------------------|--------------|-----------------|-----------------|-----------------|---|
|                        | Sample Date: | 25-Oct-21 09:25 | 25-Oct-21 09:25 | 25-Oct-21 09:25 | - |
|                        | Sample ID:   | 2144126-01      | 2144126-02      | 2144126-03      | - |
|                        | MDL/Units    | Water           | Water           | Water           | - |
| 1,1,2-Trichloroethane  | 0.5 ug/L     | <0.5            | <0.5            | <0.5            | - |
| Trichloroethylene      | 0.5 ug/L     | <0.5            | <0.5            | <0.5            | - |
| Trichlorofluoromethane | 1.0 ug/L     | <1.0            | <1.0            | <1.0            | - |
| Vinyl chloride         | 0.5 ug/L     | <0.5            | <0.5            | <0.5            | - |
| m,p-Xylenes            | 0.5 ug/L     | <0.5            | 0.9             | 0.5             | - |
| o-Xylene               | 0.5 ug/L     | <0.5            | <0.5            | <0.5            | - |
| Xylenes, total         | 0.5 ug/L     | <0.5            | 0.9             | 0.5             | - |
| 4-Bromofluorobenzene   | Surrogate    | 106%            | 108%            | 114%            | - |
| Dibromofluoromethane   | Surrogate    | 88.9%           | 90.0%           | 104%            | - |
| Toluene-d8             | Surrogate    | 94.4%           | 94.0%           | 92.8%           | - |

**Hydrocarbons**

|                   |          |      |      |      |   |
|-------------------|----------|------|------|------|---|
| F1 PHCs (C6-C10)  | 25 ug/L  | <25  | <25  | <25  | - |
| F2 PHCs (C10-C16) | 100 ug/L | <100 | <100 | <100 | - |
| F3 PHCs (C16-C34) | 100 ug/L | <100 | <100 | 288  | - |
| F4 PHCs (C34-C50) | 100 ug/L | <100 | <100 | <100 | - |

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

**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         | 85.2   |                 | ug/L  |               | 107  | 50-140     |     |           |       |
| Surrogate: Dibromofluoromethane         | 71.7   |                 | ug/L  |               | 89.6 | 50-140     |     |           |       |
| Surrogate: Toluene-d8                   | 76.4   |                 | ug/L  |               | 95.6 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

**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        |       |
| F2 PHCs (C10-C16)                       | 1060   | 100             | ug/L  | 952           |      |            | 10.8 | 30        |       |
| F3 PHCs (C16-C34)                       | 890    | 100             | ug/L  | 857           |      |            | 3.9  | 30        |       |
| F4 PHCs (C34-C50)                       | ND     | 100             | 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                | 0.86   | 0.5             | ug/L  | 0.83          |      |            | 3.6  | 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                     | 0.83   | 0.5             | ug/L  | 0.76          |      |            | 8.8  | 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                       | 2.12   | 0.5             | ug/L  | 2.09          |      |            | 1.4  | 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         | 84.9   |                 | ug/L  |               | 106  | 50-140     |      |           |       |
| Surrogate: Dibromofluoromethane         | 71.2   |                 | ug/L  |               | 89.0 | 50-140     |      |           |       |
| Surrogate: Toluene-d8                   | 76.7   |                 | ug/L  |               | 95.9 | 50-140     |      |           |       |

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

**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)                        | 1730   | 25              | ug/L  | ND            | 86.6 | 68-117     |     |           |       |
| F2 PHCs (C10-C16)                       | 1500   | 100             | ug/L  | ND            | 93.8 | 60-140     |     |           |       |
| F3 PHCs (C16-C34)                       | 4060   | 100             | ug/L  | ND            | 104  | 60-140     |     |           |       |
| F4 PHCs (C34-C50)                       | 2760   | 100             | ug/L  | ND            | 111  | 60-140     |     |           |       |
| <b>Volatiles</b>                        |        |                 |       |               |      |            |     |           |       |
| Acetone                                 | 108    | 5.0             | ug/L  | ND            | 108  | 50-140     |     |           |       |
| Benzene                                 | 34.3   | 0.5             | ug/L  | ND            | 85.8 | 60-130     |     |           |       |
| Bromodichloromethane                    | 34.5   | 0.5             | ug/L  | ND            | 86.2 | 60-130     |     |           |       |
| Bromoform                               | 33.5   | 0.5             | ug/L  | ND            | 83.7 | 60-130     |     |           |       |
| Bromomethane                            | 43.1   | 0.5             | ug/L  | ND            | 108  | 50-140     |     |           |       |
| Carbon Tetrachloride                    | 34.9   | 0.2             | ug/L  | ND            | 87.2 | 60-130     |     |           |       |
| Chlorobenzene                           | 36.3   | 0.5             | ug/L  | ND            | 90.8 | 60-130     |     |           |       |
| Chloroform                              | 34.6   | 0.5             | ug/L  | ND            | 86.5 | 60-130     |     |           |       |
| Dibromochloromethane                    | 34.4   | 0.5             | ug/L  | ND            | 85.9 | 60-130     |     |           |       |
| Dichlorodifluoromethane                 | 35.2   | 1.0             | ug/L  | ND            | 88.0 | 50-140     |     |           |       |
| 1,2-Dichlorobenzene                     | 35.1   | 0.5             | ug/L  | ND            | 87.8 | 60-130     |     |           |       |
| 1,3-Dichlorobenzene                     | 35.7   | 0.5             | ug/L  | ND            | 89.2 | 60-130     |     |           |       |
| 1,4-Dichlorobenzene                     | 35.5   | 0.5             | ug/L  | ND            | 88.7 | 60-130     |     |           |       |
| 1,1-Dichloroethane                      | 34.4   | 0.5             | ug/L  | ND            | 86.0 | 60-130     |     |           |       |
| 1,2-Dichloroethane                      | 34.5   | 0.5             | ug/L  | ND            | 86.4 | 60-130     |     |           |       |
| 1,1-Dichloroethylene                    | 38.6   | 0.5             | ug/L  | ND            | 96.6 | 60-130     |     |           |       |
| cis-1,2-Dichloroethylene                | 30.6   | 0.5             | ug/L  | ND            | 76.4 | 60-130     |     |           |       |
| trans-1,2-Dichloroethylene              | 32.2   | 0.5             | ug/L  | ND            | 80.5 | 60-130     |     |           |       |
| 1,2-Dichloropropane                     | 36.2   | 0.5             | ug/L  | ND            | 90.5 | 60-130     |     |           |       |
| cis-1,3-Dichloropropylene               | 34.6   | 0.5             | ug/L  | ND            | 86.5 | 60-130     |     |           |       |
| trans-1,3-Dichloropropylene             | 37.2   | 0.5             | ug/L  | ND            | 93.0 | 60-130     |     |           |       |
| Ethylbenzene                            | 39.9   | 0.5             | ug/L  | ND            | 99.8 | 60-130     |     |           |       |
| Ethylene dibromide (dibromoethane, 1,2- | 37.7   | 0.2             | ug/L  | ND            | 94.3 | 60-130     |     |           |       |
| Hexane                                  | 32.0   | 1.0             | ug/L  | ND            | 80.1 | 60-130     |     |           |       |
| Methyl Ethyl Ketone (2-Butanone)        | 106    | 5.0             | ug/L  | ND            | 106  | 50-140     |     |           |       |
| Methyl Isobutyl Ketone                  | 112    | 5.0             | ug/L  | ND            | 112  | 50-140     |     |           |       |
| Methyl tert-butyl ether                 | 112    | 2.0             | ug/L  | ND            | 112  | 50-140     |     |           |       |
| Methylene Chloride                      | 36.1   | 5.0             | ug/L  | ND            | 90.2 | 60-130     |     |           |       |
| Styrene                                 | 30.9   | 0.5             | ug/L  | ND            | 77.2 | 60-130     |     |           |       |
| 1,1,1,2-Tetrachloroethane               | 44.2   | 0.5             | ug/L  | ND            | 110  | 60-130     |     |           |       |
| 1,1,1,2-Tetrachloroethane               | 42.2   | 0.5             | ug/L  | ND            | 106  | 60-130     |     |           |       |
| Tetrachloroethylene                     | 37.3   | 0.5             | ug/L  | ND            | 93.2 | 60-130     |     |           |       |
| Toluene                                 | 35.7   | 0.5             | ug/L  | ND            | 89.2 | 60-130     |     |           |       |
| 1,1,1-Trichloroethane                   | 39.0   | 0.5             | ug/L  | ND            | 97.4 | 60-130     |     |           |       |
| 1,1,2-Trichloroethane                   | 43.5   | 0.5             | ug/L  | ND            | 109  | 60-130     |     |           |       |
| Trichloroethylene                       | 34.7   | 0.5             | ug/L  | ND            | 86.8 | 60-130     |     |           |       |
| Trichlorofluoromethane                  | 37.9   | 1.0             | ug/L  | ND            | 94.8 | 60-130     |     |           |       |
| Vinyl chloride                          | 40.5   | 0.5             | ug/L  | ND            | 101  | 50-140     |     |           |       |
| m,p-Xylenes                             | 73.6   | 0.5             | ug/L  | ND            | 92.0 | 60-130     |     |           |       |
| o-Xylene                                | 37.3   | 0.5             | ug/L  | ND            | 93.3 | 60-130     |     |           |       |
| Surrogate: 4-Bromofluorobenzene         | 95.9   |                 | ug/L  |               | 120  | 50-140     |     |           |       |
| Surrogate: Dibromofluoromethane         | 80.5   |                 | ug/L  |               | 101  | 50-140     |     |           |       |
| Surrogate: Toluene-d8                   | 74.8   |                 | ug/L  |               | 93.5 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

**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.



2144126

No 132418

|  |  |  |
|--|--|--|
| Client Name: <b>PATERSON GROUP</b>               | Project Ref: <b>PE5434</b>                 | Page <u>1</u> of <u>1</u>  |
| Contact Name: <b>MIKE BEAUDOIN</b>               | Quote #:                                   | Turnaround Time<br><input checked="" type="checkbox"/> 1 day <input type="checkbox"/> 3 day<br><input type="checkbox"/> 2 day <input type="checkbox"/> Regular |
| Address: <b>154 COLONNADE Rd. S. OTTAWA, ON.</b> | PO #: <b>32096</b>                         |  |
| Telephone: <b>613 226 7381</b>                   | E-mail: <b>M.BEAUDOIN@PATERSONGROUP.CO</b> |  |

| Regulation 153/04                                  |   | Other Regulation                  |                                    | Matrix Type: S (Soil/Sed.) GW (Ground Water)<br>SW (Surface Water) SS (Storm/Sanitary Sewer)<br>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 |      | PHCs F1-F4+BTEX | VOCs | 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 <u>7</u> | For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No |                                   | Mun: _____                         | <input type="checkbox"/> Other: _____   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| Sample ID/Location Name                            |   | Matrix                            | Air Volume                         | # of Containers   | Date      | Time              | PHCs F1-F4+BTEX | VOCs         | PAHs | Metals by ICP   | Hg   | CrVI | B (HWS)       |    |      |         |  |  |  |  |  |  |  |  |  |
| 1  | BH1-21-GW   | GW                                | /                                  | 3   | OCT 25/21 | 9:25A             | /               | /            |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 2  | BH2-21-GW   | ↓                                 | /                                  | 3   | ↓         | 9:55A             | /               | /            |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 3  | MW9-GW  | ↓                                 | /                                  | 3   | ↓         |                   | /               | /            |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 4  |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 5  |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 6  |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 7  |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 8  |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 9  |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |
| 10   |   |                                   |                                    |   |           |                   |                 |              |      |                 |      |      |               |    |      |         |  |  |  |  |  |  |  |  |  |

|  |                           |                                      |   |
|--|---------------------------|--------------------------------------|---|
| Comments:                                      |                           | Method of Delivery: <b>Drop Box</b>  |   |
| Relinquished By (Sign):                        | Received By Driver/Depot: | Received at Lab: <b>Suneeporn</b>    | Verified By:                                    |
| Relinquished By (Print): <b>DOMINIC LANORA</b> | Date/Time:                | Date/Time: <b>OCT 25, 2021 04:50</b> | Date/Time: <b>OCT 25, 2021 5:00</b>             |
| Date/Time: <b>OCT 25, 2021</b>                 | Temperature: _____ °C     | Temperature: <b>14.2</b> °C          | pH Verified: <input type="checkbox"/> By: _____ |



## Certificate of Analysis

**Paterson Group Consulting Engineers**

154 Colonnade Road South  
Nepean, ON K2E 7J5  
Attn: Mike Beaudoin

Client PO: 32968  
Project: PE5434  
Custody: 132298

Report Date: 23-Nov-2021  
Order Date: 18-Nov-2021

**Order #: 2147505**

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

| Paracel ID | Client ID |
|------------|-----------|
| 2147505-01 | BH4-21-GW |

Approved By:



Dale Robertson, BSc  
Laboratory Director

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

**Analysis Summary Table**

| Analysis          | Method Reference/Description    | Extraction Date | Analysis Date |
|-------------------|---------------------------------|-----------------|---------------|
| BTEX by P&T GC-MS | EPA 624 - P&T GC-MS             | 21-Nov-21       | 21-Nov-21     |
| PHC F1            | CWS Tier 1 - P&T GC-FID         | 19-Nov-21       | 21-Nov-21     |
| PHCs F2 to F4     | CWS Tier 1 - GC-FID, extraction | 22-Nov-21       | 23-Nov-21     |

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

|                     |                 |   |   |   |
|---------------------|-----------------|---|---|---|
| <b>Client ID:</b>   | BH4-21-GW       | - | - | - |
| <b>Sample Date:</b> | 18-Nov-21 10:05 | - | - | - |
| <b>Sample ID:</b>   | 2147505-01      | - | - | - |
| <b>MDL/Units</b>    | Water           | - | - | - |

**Volatiles**

|                |           |       |   |   |   |
|----------------|-----------|-------|---|---|---|
| Benzene        | 0.5 ug/L  | 1.9   | - | - | - |
| Ethylbenzene   | 0.5 ug/L  | 13.5  | - | - | - |
| Toluene        | 0.5 ug/L  | 0.6   | - | - | - |
| m,p-Xylenes    | 0.5 ug/L  | 10.0  | - | - | - |
| o-Xylene       | 0.5 ug/L  | 0.6   | - | - | - |
| Xylenes, total | 0.5 ug/L  | 10.6  | - | - | - |
| Toluene-d8     | Surrogate | 92.5% | - | - | - |

**Hydrocarbons**

|                   |          |      |   |   |   |
|-------------------|----------|------|---|---|---|
| F1 PHCs (C6-C10)  | 25 ug/L  | 346  | - | - | - |
| F2 PHCs (C10-C16) | 100 ug/L | 1700 | - | - | - |
| F3 PHCs (C16-C34) | 100 ug/L | <100 | - | - | - |
| F4 PHCs (C34-C50) | 100 ug/L | <100 | - | - | - |

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

**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>      |        |                 |       |               |      |            |     |           |       |
| Benzene               | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Ethylbenzene          | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Toluene               | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| m,p-Xylenes           | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| o-Xylene              | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Xylenes, total        | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Surrogate: Toluene-d8 | 76.3   |                 | ug/L  |               | 95.4 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

**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>      |        |                 |       |               |      |            |     |           |       |
| Benzene               | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Ethylbenzene          | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Toluene               | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| m,p-Xylenes           | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| o-Xylene              | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Surrogate: Toluene-d8 | 76.3   |                 | ug/L  |               | 95.4 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

**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            | 84.9 | 68-117     |     |           |       |
| F2 PHCs (C10-C16)     | 1440   | 100             | ug/L  | ND            | 90.1 | 60-140     |     |           |       |
| F3 PHCs (C16-C34)     | 4050   | 100             | ug/L  | ND            | 103  | 60-140     |     |           |       |
| F4 PHCs (C34-C50)     | 1980   | 100             | ug/L  | ND            | 79.9 | 60-140     |     |           |       |
| <b>Volatiles</b>      |        |                 |       |               |      |            |     |           |       |
| Benzene               | 36.8   | 0.5             | ug/L  | ND            | 92.0 | 60-130     |     |           |       |
| Ethylbenzene          | 31.8   | 0.5             | ug/L  | ND            | 79.5 | 60-130     |     |           |       |
| Toluene               | 42.3   | 0.5             | ug/L  | ND            | 106  | 60-130     |     |           |       |
| m,p-Xylenes           | 90.0   | 0.5             | ug/L  | ND            | 112  | 60-130     |     |           |       |
| o-Xylene              | 32.0   | 0.5             | ug/L  | ND            | 80.0 | 60-130     |     |           |       |
| Surrogate: Toluene-d8 | 73.6   |                 | ug/L  |               | 92.0 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

**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.



3rd.  
4J8  
s.com

Parcel Order Number  
(Lab Use Only)

2147505

Chain Of Custody

(Lab Use Only)

No 132298

Client Name: **PATERSON**  
Contact Name: **MICHAEL BEAUDION**  
Address: **154 COLONNADE Rd. S, OTTAWA, ON**  
Telephone: **613 226 7381**

Project Ref: **PE5434**  
Quote #: \_\_\_\_\_  
PO #: **32968**  
E-mail: **MBEAUDION@PATERSONGROUP.CA**

Page \_\_\_ of \_\_\_  
Turnaround Time  
 1 day  3 day  
 2 day  Regular  
Date Required: \_\_\_\_\_

| Regulation 153/04   |                                     | Other Regulation                  |                                       | Matrix Type: S (Soil/Sed.) GW (Ground Water)<br>SW (Surface Water) SS (Storm/Sanitary Sewer)<br>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 |              | PHCs F1-F4+BTEX | VOCs                                | 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 <u>7</u>                |                                     |                                   | Mun: _____                            |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No |                                     |                                   | <input type="checkbox"/> Other: _____ |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| Sample ID/Location Name   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 1   | B44-21-GW                           |                                   |                                       |   |        | GW                |                 | 3            | Nov. 18/2021 | 10:05A          | <input checked="" type="checkbox"/> |      |               |    |      |         |  |
| 2   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 3   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 4   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 5   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 6   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 7   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 8   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 9   |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |
| 10  |                                     |                                   |                                       |   |        |                   |                 |              |              |                 |                                     |      |               |    |      |         |  |

Comments: \_\_\_\_\_

Method of Delivery: **TALACEL COURIER**

|  |  |                                     |   |
|--|--|-------------------------------------|---|
| Relinquished By (Sign): <i>[Signature]</i>     | Received By Driver/Depot: <i>A. FLOUVE</i> | Received at Lab: <i>[Signature]</i> | Verified By: <i>[Signature]</i>                 |
| Relinquished By (Print): <b>DOMINIC LANDRY</b> | Date/Time: <b>18/11/21 3:00</b>            | Date/Time: <b>Nov 18, 21 17:30</b>  | Date/Time: <b>Nov 19, 2021 10:07</b>            |
| Date/Time: <b>Nov. 18, 2021</b>                | Temperature: _____ °C <i>M.</i>            | Temperature: <b>14.8 °C</b>         | pH Verified: <input type="checkbox"/> By: _____ |

Chain of Custody (Env.) xlsx



## Certificate of Analysis

**Paterson Group Consulting Engineers**

154 Colonnade Road South  
Nepean, ON K2E 7J5  
Attn: Mike Beaudoin

Client PO: 32744  
Project: PE5434  
Custody: 133093

Report Date: 8-Sep-2021  
Order Date: 2-Sep-2021

**Order #: 2136528**

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

| Paracel ID | Client ID |
|------------|-----------|
| 2136528-01 | MW3-GW    |
| 2136528-02 | MW6-GW    |
| 2136528-03 | MW11-GW   |

Approved By:



Dale Robertson, BSc  
Laboratory Director

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

**Analysis Summary Table**

| Analysis               | Method Reference/Description    | Extraction Date | Analysis Date |
|------------------------|---------------------------------|-----------------|---------------|
| BTEX by P&T GC-MS      | EPA 624 - P&T GC-MS             | 4-Sep-21        | 4-Sep-21      |
| Metals, ICP-MS         | EPA 200.8 - ICP-MS              | 3-Sep-21        | 3-Sep-21      |
| PHC F1                 | CWS Tier 1 - P&T GC-FID         | 3-Sep-21        | 4-Sep-21      |
| PHCs F2 to F4          | CWS Tier 1 - GC-FID, extraction | 7-Sep-21        | 7-Sep-21      |
| REG 153: PAHs by GC-MS | EPA 625 - GC-MS, extraction     | 7-Sep-21        | 7-Sep-21      |

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

|  | Client ID:   | MW3-GW          | MW6-GW          | MW11-GW         | - |
|--|--------------|-----------------|-----------------|-----------------|---|
|  | Sample Date: | 01-Sep-21 10:30 | 01-Sep-21 11:30 | 01-Sep-21 16:00 | - |
|  | Sample ID:   | 2136528-01      | 2136528-02      | 2136528-03      | - |
|  | MDL/Units    | Water           | Water           | Water           | - |

**Metals**

|            | MDL/Units | MW3-GW | MW6-GW | MW11-GW | - |
|------------|-----------|--------|--------|---------|---|
| Antimony   | 0.5 ug/L  | -      | -      | 0.7     | - |
| Arsenic    | 1 ug/L    | -      | -      | 2       | - |
| Barium     | 1 ug/L    | -      | -      | 320     | - |
| Beryllium  | 0.5 ug/L  | -      | -      | <0.5    | - |
| Boron      | 10 ug/L   | -      | -      | 431     | - |
| Cadmium    | 0.1 ug/L  | -      | -      | <0.1    | - |
| Chromium   | 1 ug/L    | -      | -      | <1      | - |
| Cobalt     | 0.5 ug/L  | -      | -      | <0.5    | - |
| Copper     | 0.5 ug/L  | -      | -      | 0.9     | - |
| Lead       | 0.1 ug/L  | -      | -      | 0.2     | - |
| Molybdenum | 0.5 ug/L  | -      | -      | 5.4     | - |
| Nickel     | 1 ug/L    | -      | -      | 2       | - |
| Selenium   | 1 ug/L    | -      | -      | <1      | - |
| Silver     | 0.1 ug/L  | -      | -      | <0.1    | - |
| Sodium     | 200 ug/L  | -      | -      | 3120000 | - |
| Thallium   | 0.1 ug/L  | -      | -      | <0.1    | - |
| Uranium    | 0.1 ug/L  | -      | -      | 3.5     | - |
| Vanadium   | 0.5 ug/L  | -      | -      | 0.9     | - |
| Zinc       | 5 ug/L    | -      | -      | 7       | - |

**Volatiles**

|                | MDL/Units | MW3-GW | MW6-GW | MW11-GW | - |
|----------------|-----------|--------|--------|---------|---|
| Benzene        | 0.5 ug/L  | <0.5   | -      | -       | - |
| Ethylbenzene   | 0.5 ug/L  | <0.5   | -      | -       | - |
| Toluene        | 0.5 ug/L  | <0.5   | -      | -       | - |
| m,p-Xylenes    | 0.5 ug/L  | <0.5   | -      | -       | - |
| o-Xylene       | 0.5 ug/L  | <0.5   | -      | -       | - |
| Xylenes, total | 0.5 ug/L  | <0.5   | -      | -       | - |
| Toluene-d8     | Surrogate | 97.0%  | -      | -       | - |

**Hydrocarbons**

|                   | MDL/Units | MW3-GW | MW6-GW | MW11-GW | - |
|-------------------|-----------|--------|--------|---------|---|
| 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   | -      | -       | - |

**Semi-Volatiles**

|                | MDL/Units | MW3-GW | MW6-GW | MW11-GW | - |
|----------------|-----------|--------|--------|---------|---|
| Acenaphthene   | 0.05 ug/L | -      | <0.05  | -       | - |
| Acenaphthylene | 0.05 ug/L | -      | <0.05  | -       | - |

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

|                          | Client ID:   | MW3-GW          | MW6-GW          | MW11-GW         | - |
|--------------------------|--------------|-----------------|-----------------|-----------------|---|
|                          | Sample Date: | 01-Sep-21 10:30 | 01-Sep-21 11:30 | 01-Sep-21 16:00 | - |
|                          | Sample ID:   | 2136528-01      | 2136528-02      | 2136528-03      | - |
|                          | MDL/Units    | Water           | Water           | Water           | - |
| Anthracene               | 0.01 ug/L    | -               | <0.01           | -               | - |
| Benzo [a] anthracene     | 0.01 ug/L    | -               | <0.01           | -               | - |
| Benzo [a] pyrene         | 0.01 ug/L    | -               | <0.01           | -               | - |
| Benzo [b] fluoranthene   | 0.05 ug/L    | -               | <0.05           | -               | - |
| Benzo [g,h,i] perylene   | 0.05 ug/L    | -               | <0.05           | -               | - |
| Benzo [k] fluoranthene   | 0.05 ug/L    | -               | <0.05           | -               | - |
| Chrysene                 | 0.05 ug/L    | -               | <0.05           | -               | - |
| Dibenzo [a,h] anthracene | 0.05 ug/L    | -               | <0.05           | -               | - |
| Fluoranthene             | 0.01 ug/L    | -               | <0.01           | -               | - |
| Fluorene                 | 0.05 ug/L    | -               | <0.05           | -               | - |
| Indeno [1,2,3-cd] pyrene | 0.05 ug/L    | -               | <0.05           | -               | - |
| 1-Methylnaphthalene      | 0.05 ug/L    | -               | <0.05           | -               | - |
| 2-Methylnaphthalene      | 0.05 ug/L    | -               | <0.05           | -               | - |
| Methylnaphthalene (1&2)  | 0.10 ug/L    | -               | <0.10           | -               | - |
| Naphthalene              | 0.05 ug/L    | -               | <0.05           | -               | - |
| Phenanthrene             | 0.05 ug/L    | -               | <0.05           | -               | - |
| Pyrene                   | 0.01 ug/L    | -               | <0.01           | -               | - |
| 2-Fluorobiphenyl         | Surrogate    | -               | 94.3%           | -               | - |
| Terphenyl-d14            | Surrogate    | -               | 113%            | -               | - |

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

**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>Metals</b>               |        |                 |       |               |      |            |     |           |       |
| Antimony                    | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Arsenic                     | ND     | 1               | ug/L  |               |      |            |     |           |       |
| Barium                      | ND     | 1               | ug/L  |               |      |            |     |           |       |
| Beryllium                   | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Boron                       | ND     | 10              | ug/L  |               |      |            |     |           |       |
| Cadmium                     | ND     | 0.1             | ug/L  |               |      |            |     |           |       |
| Chromium                    | ND     | 1               | ug/L  |               |      |            |     |           |       |
| Cobalt                      | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Copper                      | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Lead                        | ND     | 0.1             | ug/L  |               |      |            |     |           |       |
| Molybdenum                  | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Nickel                      | ND     | 1               | ug/L  |               |      |            |     |           |       |
| Selenium                    | ND     | 1               | ug/L  |               |      |            |     |           |       |
| Silver                      | ND     | 0.1             | ug/L  |               |      |            |     |           |       |
| Sodium                      | ND     | 200             | ug/L  |               |      |            |     |           |       |
| Thallium                    | ND     | 0.1             | ug/L  |               |      |            |     |           |       |
| Uranium                     | ND     | 0.1             | ug/L  |               |      |            |     |           |       |
| Vanadium                    | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Zinc                        | ND     | 5               | ug/L  |               |      |            |     |           |       |
| <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 | 19.7   |                 | ug/L  |               | 98.7 | 50-140     |     |           |       |
| Surrogate: Terphenyl-d14    | 23.2   |                 | ug/L  |               | 116  | 50-140     |     |           |       |
| <b>Volatiles</b>            |        |                 |       |               |      |            |     |           |       |
| Benzene                     | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Ethylbenzene                | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Toluene                     | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| m,p-Xylenes                 | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| o-Xylene                    | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Xylenes, total              | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Surrogate: Toluene-d8       | 89.8   |                 | ug/L  |               | 112  | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

**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>Metals</b>         |        |                 |       |               |      |            |     |           |       |
| Antimony              | ND     | 0.5             | ug/L  | 0.53          |      |            | NC  | 20        |       |
| Arsenic               | ND     | 1               | ug/L  | ND            |      |            | NC  | 20        |       |
| Barium                | 22.3   | 1               | ug/L  | 22.5          |      |            | 0.7 | 20        |       |
| Beryllium             | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 20        |       |
| Boron                 | 23     | 10              | ug/L  | 22            |      |            | 5.4 | 20        |       |
| Cadmium               | ND     | 0.1             | ug/L  | ND            |      |            | NC  | 20        |       |
| Chromium              | ND     | 1               | ug/L  | ND            |      |            | NC  | 20        |       |
| Cobalt                | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 20        |       |
| Copper                | 1.10   | 0.5             | ug/L  | 1.10          |      |            | 0.3 | 20        |       |
| Lead                  | ND     | 0.1             | ug/L  | ND            |      |            | NC  | 20        |       |
| Molybdenum            | 1.80   | 0.5             | ug/L  | 1.79          |      |            | 0.5 | 20        |       |
| Nickel                | ND     | 1               | ug/L  | ND            |      |            | NC  | 20        |       |
| Selenium              | ND     | 1               | ug/L  | ND            |      |            | NC  | 20        |       |
| Silver                | ND     | 0.1             | ug/L  | ND            |      |            | NC  | 20        |       |
| Sodium                | 16700  | 200             | ug/L  | 17400         |      |            | 4.0 | 20        |       |
| Thallium              | ND     | 0.1             | ug/L  | ND            |      |            | NC  | 20        |       |
| Uranium               | ND     | 0.1             | ug/L  | ND            |      |            | NC  | 20        |       |
| Vanadium              | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 20        |       |
| Zinc                  | 9      | 5               | ug/L  | 9             |      |            | 7.9 | 20        |       |
| <b>Volatiles</b>      |        |                 |       |               |      |            |     |           |       |
| Benzene               | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Ethylbenzene          | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Toluene               | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| m,p-Xylenes           | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| o-Xylene              | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Surrogate: Toluene-d8 | 77.4   |                 | ug/L  |               | 96.8 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

**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)            | 1640   | 25              | ug/L  | ND            | 81.9 | 68-117     |     |           |       |
| F2 PHCs (C10-C16)           | 1290   | 100             | ug/L  | ND            | 80.7 | 60-140     |     |           |       |
| F3 PHCs (C16-C34)           | 3410   | 100             | ug/L  | ND            | 87.0 | 60-140     |     |           |       |
| F4 PHCs (C34-C50)           | 2130   | 100             | ug/L  | ND            | 85.8 | 60-140     |     |           |       |
| <b>Metals</b>               |        |                 |       |               |      |            |     |           |       |
| Antimony                    | 50.0   | 0.5             | ug/L  | 0.53          | 99.0 | 80-120     |     |           |       |
| Arsenic                     | 52.5   | 1               | ug/L  | ND            | 104  | 80-120     |     |           |       |
| Barium                      | 70.1   | 1               | ug/L  | 22.5          | 95.2 | 80-120     |     |           |       |
| Beryllium                   | 47.7   | 0.5             | ug/L  | ND            | 95.5 | 80-120     |     |           |       |
| Boron                       | 64     | 10              | ug/L  | 22            | 84.1 | 80-120     |     |           |       |
| Cadmium                     | 51.2   | 0.1             | ug/L  | ND            | 102  | 80-120     |     |           |       |
| Chromium                    | 52.5   | 1               | ug/L  | ND            | 104  | 80-120     |     |           |       |
| Cobalt                      | 51.1   | 0.5             | ug/L  | ND            | 102  | 80-120     |     |           |       |
| Copper                      | 50.0   | 0.5             | ug/L  | 1.10          | 97.8 | 80-120     |     |           |       |
| Lead                        | 42.3   | 0.1             | ug/L  | ND            | 84.4 | 80-120     |     |           |       |
| Molybdenum                  | 49.9   | 0.5             | ug/L  | 1.79          | 96.2 | 80-120     |     |           |       |
| Nickel                      | 49.9   | 1               | ug/L  | ND            | 98.8 | 80-120     |     |           |       |
| Selenium                    | 48.7   | 1               | ug/L  | ND            | 97.0 | 80-120     |     |           |       |
| Silver                      | 48.8   | 0.1             | ug/L  | ND            | 97.6 | 80-120     |     |           |       |
| Sodium                      | 26400  | 200             | ug/L  | 17400         | 90.6 | 80-120     |     |           |       |
| Thallium                    | 50.6   | 0.1             | ug/L  | ND            | 101  | 80-120     |     |           |       |
| Uranium                     | 49.1   | 0.1             | ug/L  | ND            | 98.2 | 80-120     |     |           |       |
| Vanadium                    | 52.9   | 0.5             | ug/L  | ND            | 105  | 80-120     |     |           |       |
| Zinc                        | 60     | 5               | ug/L  | 9             | 102  | 80-120     |     |           |       |
| <b>Semi-Volatiles</b>       |        |                 |       |               |      |            |     |           |       |
| Acenaphthene                | 4.93   | 0.05            | ug/L  | ND            | 98.5 | 50-140     |     |           |       |
| Acenaphthylene              | 4.49   | 0.05            | ug/L  | ND            | 89.7 | 50-140     |     |           |       |
| Anthracene                  | 5.03   | 0.01            | ug/L  | ND            | 101  | 50-140     |     |           |       |
| Benzo [a] anthracene        | 4.49   | 0.01            | ug/L  | ND            | 89.8 | 50-140     |     |           |       |
| Benzo [a] pyrene            | 5.37   | 0.01            | ug/L  | ND            | 107  | 50-140     |     |           |       |
| Benzo [b] fluoranthene      | 5.58   | 0.05            | ug/L  | ND            | 112  | 50-140     |     |           |       |
| Benzo [g,h,i] perylene      | 5.42   | 0.05            | ug/L  | ND            | 108  | 50-140     |     |           |       |
| Benzo [k] fluoranthene      | 4.94   | 0.05            | ug/L  | ND            | 98.7 | 50-140     |     |           |       |
| Chrysene                    | 5.12   | 0.05            | ug/L  | ND            | 102  | 50-140     |     |           |       |
| Dibenzo [a,h] anthracene    | 5.41   | 0.05            | ug/L  | ND            | 108  | 50-140     |     |           |       |
| Fluoranthene                | 4.75   | 0.01            | ug/L  | ND            | 95.0 | 50-140     |     |           |       |
| Fluorene                    | 4.66   | 0.05            | ug/L  | ND            | 93.2 | 50-140     |     |           |       |
| Indeno [1,2,3-cd] pyrene    | 4.64   | 0.05            | ug/L  | ND            | 92.7 | 50-140     |     |           |       |
| 1-Methylnaphthalene         | 4.96   | 0.05            | ug/L  | ND            | 99.2 | 50-140     |     |           |       |
| 2-Methylnaphthalene         | 5.30   | 0.05            | ug/L  | ND            | 106  | 50-140     |     |           |       |
| Naphthalene                 | 4.97   | 0.05            | ug/L  | ND            | 99.4 | 50-140     |     |           |       |
| Phenanthrene                | 4.54   | 0.05            | ug/L  | ND            | 90.9 | 50-140     |     |           |       |
| Pyrene                      | 4.87   | 0.01            | ug/L  | ND            | 97.4 | 50-140     |     |           |       |
| Surrogate: 2-Fluorobiphenyl | 20.5   |                 | ug/L  |               | 103  | 50-140     |     |           |       |
| Surrogate: Terphenyl-d14    | 23.2   |                 | ug/L  |               | 116  | 50-140     |     |           |       |
| <b>Volatiles</b>            |        |                 |       |               |      |            |     |           |       |
| Benzene                     | 38.8   | 0.5             | ug/L  | ND            | 97.1 | 60-130     |     |           |       |
| Ethylbenzene                | 38.8   | 0.5             | ug/L  | ND            | 97.1 | 60-130     |     |           |       |

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

**Method Quality Control: Spike**

| Analyte               | Result | Reporting Limit | Units | Source Result | %REC | %REC Limit | RPD | RPD Limit | Notes |
|-----------------------|--------|-----------------|-------|---------------|------|------------|-----|-----------|-------|
| Toluene               | 28.9   | 0.5             | ug/L  | ND            | 72.2 | 60-130     |     |           |       |
| m,p-Xylenes           | 81.0   | 0.5             | ug/L  | ND            | 101  | 60-130     |     |           |       |
| o-Xylene              | 31.9   | 0.5             | ug/L  | ND            | 79.8 | 60-130     |     |           |       |
| Surrogate: Toluene-d8 | 93.4   |                 | ug/L  |               | 117  | 50-140     |     |           |       |



Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

**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.



|  |                            |  |
|--|----------------------------|--|
| Client Name: <b>PATERSON</b>                     | Project Ref: <b>PE5434</b> | Page <u>  </u> of <u>  </u>  |
| Contact Name: <b>MIKE BEAUDOIN</b>               | Quote #:                   | Turnaround Time  |
| Address: <b>154 COLONNADE Rd. S. OTTAWA, ON.</b> | PO #: <b>32744</b>         | <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day              |
| Telephone: <b>613 226 7381</b>                   | E-mail:                    | <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular |
|  |                            | Date Required: _____   |

| REG 153/04 <input type="checkbox"/> REG 406/19 <input type="checkbox"/>                              |  | Other Regulation              |                               | Matrix Type: S (Soil/Sed.) GW (Ground Water)<br>SW (Surface Water) SS (Storm/Sanitary Sewer)<br>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"/> CCME | <input type="checkbox"/> MISA |   |                  | PHCS F1-F4+BTEX   | VOCs                                | 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"/> SU - Sani <input type="checkbox"/> SU - Storm |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| <input checked="" type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other                      | Mun: _____   |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| <input type="checkbox"/> Table _____   | Other: _____   |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No                                    |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| Sample ID/Location Name  |  | Matrix                        | Air Volume                    | # of Containers   | Sample Taken     |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
|  |  |                               |                               |   | Date             | Time              |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 1  | <b>mw3-GW</b>  | <b>GW</b>                     | <b>1</b>                      | <b>3</b>  | <b>SEPT 1/21</b> | <b>10:30A</b>     | <input checked="" type="checkbox"/> |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 2  | <b>mw6-GW</b>  | <b>GW</b>                     | <b>1</b>                      | <b>1</b>  | <b>↓</b>         | <b>11:30A</b>     |                                     |      | <input checked="" type="checkbox"/> |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 3  | <b>mw11-GW</b>   | <b>GW</b>                     | <b>1</b>                      | <b>3</b>  | <b>↓</b>         | <b>4:00P</b>      |                                     |      |                                     | <input checked="" type="checkbox"/> |      |         |  |  |  |  |  |  |  |  |  |  |
| 4  |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 5  |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 6  |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 7  |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 8  |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 9  |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |
| 10   |  |                               |                               |   |                  |                   |                                     |      |                                     |                                     |      |         |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |
|--|--|--|--|
| Comments:                                      |  | Method of Delivery: <b>PARACEL COURIER</b> |  |
| Relinquished By (Sign):                        | Received By Driver/Depot: <b>A. J. J. J.</b> | Received at Lab: <b>Jineeporn Dhmai</b>    | Verified By:   |
| Relinquished By (Print): <b>DOMINIC LAVOIE</b> | Date/Time: <b>02/09/21 1:14</b>              | Date/Time: <b>Sept 2, 2021 04:35</b>       | Date/Time: <b>sept 2 2021 5:00</b>                   |
| Date/Time: <b>SEPT. 2, 2021</b>                | Temperature: <b>°C 7.1</b>                   | Temperature: <b>18.7 °C</b>                | pH Verified: <input checked="" type="checkbox"/> By: |

## Certificate of Analysis

**Paterson Group Consulting Engineers**

154 Colonnade Road South  
Nepean, ON K2E 7J5  
Attn: Mike Beaudoin

Client PO: 32095  
Project: PE5434  
Custody: 132413

Report Date: 5-Oct-2021  
Order Date: 29-Sep-2021

**Order #: 2140459**

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

| Paracel ID | Client ID |
|------------|-----------|
| 2140459-01 | MW3-GW2   |
| 2140459-02 | MW6-GW2   |

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

### Analysis Summary Table

| Analysis               | Method Reference/Description    | Extraction Date | Analysis Date |
|------------------------|---------------------------------|-----------------|---------------|
| BTEX by P&T GC-MS      | EPA 624 - P&T GC-MS             | 30-Sep-21       | 30-Sep-21     |
| PHC F1                 | CWS Tier 1 - P&T GC-FID         | 30-Sep-21       | 30-Sep-21     |
| PHCs F2 to F4          | CWS Tier 1 - GC-FID, extraction | 4-Oct-21        | 5-Oct-21      |
| REG 153: PAHs by GC-MS | EPA 625 - GC-MS, extraction     | 4-Oct-21        | 5-Oct-21      |

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

|                     |                 |                 |   |   |
|---------------------|-----------------|-----------------|---|---|
| <b>Client ID:</b>   | MW3-GW2         | MW6-GW2         | - | - |
| <b>Sample Date:</b> | 27-Sep-21 09:00 | 27-Sep-21 09:00 | - | - |
| <b>Sample ID:</b>   | 2140459-01      | 2140459-02      | - | - |
| <b>MDL/Units</b>    | Water           | Water           | - | - |

| Volatiles      |           |       |   |   |   |
|----------------|-----------|-------|---|---|---|
| Benzene        | 0.5 ug/L  | <0.5  | - | - | - |
| Ethylbenzene   | 0.5 ug/L  | <0.5  | - | - | - |
| Toluene        | 0.5 ug/L  | <0.5  | - | - | - |
| m,p-Xylenes    | 0.5 ug/L  | <0.5  | - | - | - |
| o-Xylene       | 0.5 ug/L  | <0.5  | - | - | - |
| Xylenes, total | 0.5 ug/L  | <0.5  | - | - | - |
| Toluene-d8     | Surrogate | 94.7% | - | - | - |

| 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 | - | - | - |

| Semi-Volatiles           |           |   |       |   |   |
|--------------------------|-----------|---|-------|---|---|
| Acenaphthene             | 0.05 ug/L | - | <0.05 | - | - |
| Acenaphthylene           | 0.05 ug/L | - | <0.05 | - | - |
| Anthracene               | 0.01 ug/L | - | <0.01 | - | - |
| Benzo [a] anthracene     | 0.01 ug/L | - | <0.01 | - | - |
| Benzo [a] pyrene         | 0.01 ug/L | - | <0.01 | - | - |
| Benzo [b] fluoranthene   | 0.05 ug/L | - | <0.05 | - | - |
| Benzo [g,h,i] perylene   | 0.05 ug/L | - | <0.05 | - | - |
| Benzo [k] fluoranthene   | 0.05 ug/L | - | <0.05 | - | - |
| Chrysene                 | 0.05 ug/L | - | <0.05 | - | - |
| Dibenzo [a,h] anthracene | 0.05 ug/L | - | <0.05 | - | - |
| Fluoranthene             | 0.01 ug/L | - | <0.01 | - | - |
| Fluorene                 | 0.05 ug/L | - | <0.05 | - | - |
| Indeno [1,2,3-cd] pyrene | 0.05 ug/L | - | <0.05 | - | - |
| 1-Methylnaphthalene      | 0.05 ug/L | - | 0.12  | - | - |
| 2-Methylnaphthalene      | 0.05 ug/L | - | 0.05  | - | - |
| Methylnaphthalene (1&2)  | 0.10 ug/L | - | 0.17  | - | - |
| Naphthalene              | 0.05 ug/L | - | <0.05 | - | - |
| Phenanthrene             | 0.05 ug/L | - | <0.05 | - | - |
| Pyrene                   | 0.01 ug/L | - | 0.03  | - | - |
| 2-Fluorobiphenyl         | Surrogate | - | 85.6% | - | - |
| Terphenyl-d14            | Surrogate | - | 109%  | - | - |

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

**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 | 17.1   |                 | ug/L  |               | 85.6 | 50-140     |     |           |       |
| Surrogate: Terphenyl-d14    | 23.7   |                 | ug/L  |               | 118  | 50-140     |     |           |       |
| <b>Volatiles</b>            |        |                 |       |               |      |            |     |           |       |
| Benzene                     | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Ethylbenzene                | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Toluene                     | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| m,p-Xylenes                 | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| o-Xylene                    | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Xylenes, total              | ND     | 0.5             | ug/L  |               |      |            |     |           |       |
| Surrogate: Toluene-d8       | 77.0   |                 | ug/L  |               | 96.2 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

**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>      |        |                 |       |               |      |            |     |           |       |
| Benzene               | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Ethylbenzene          | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Toluene               | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| m,p-Xylenes           | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| o-Xylene              | ND     | 0.5             | ug/L  | ND            |      |            | NC  | 30        |       |
| Surrogate: Toluene-d8 | 75.3   |                 | ug/L  |               | 94.2 | 50-140     |     |           |       |

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

**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)            | 1910   | 25              | ug/L  | ND            | 95.7 | 68-117     |     |           |       |
| F2 PHCs (C10-C16)           | 1200   | 100             | ug/L  | ND            | 75.0 | 60-140     |     |           |       |
| F3 PHCs (C16-C34)           | 3190   | 100             | ug/L  | ND            | 81.3 | 60-140     |     |           |       |
| F4 PHCs (C34-C50)           | 2170   | 100             | ug/L  | ND            | 87.7 | 60-140     |     |           |       |
| <b>Semi-Volatiles</b>       |        |                 |       |               |      |            |     |           |       |
| Acenaphthene                | 4.60   | 0.05            | ug/L  | ND            | 92.1 | 50-140     |     |           |       |
| Acenaphthylene              | 3.25   | 0.05            | ug/L  | ND            | 65.1 | 50-140     |     |           |       |
| Anthracene                  | 4.00   | 0.01            | ug/L  | ND            | 79.9 | 50-140     |     |           |       |
| Benzo [a] anthracene        | 3.91   | 0.01            | ug/L  | ND            | 78.3 | 50-140     |     |           |       |
| Benzo [a] pyrene            | 3.84   | 0.01            | ug/L  | ND            | 76.7 | 50-140     |     |           |       |
| Benzo [b] fluoranthene      | 5.67   | 0.05            | ug/L  | ND            | 113  | 50-140     |     |           |       |
| Benzo [g,h,i] perylene      | 4.83   | 0.05            | ug/L  | ND            | 96.6 | 50-140     |     |           |       |
| Benzo [k] fluoranthene      | 5.43   | 0.05            | ug/L  | ND            | 109  | 50-140     |     |           |       |
| Chrysene                    | 4.65   | 0.05            | ug/L  | ND            | 93.0 | 50-140     |     |           |       |
| Dibenzo [a,h] anthracene    | 5.22   | 0.05            | ug/L  | ND            | 104  | 50-140     |     |           |       |
| Fluoranthene                | 4.13   | 0.01            | ug/L  | ND            | 82.5 | 50-140     |     |           |       |
| Fluorene                    | 3.93   | 0.05            | ug/L  | ND            | 78.7 | 50-140     |     |           |       |
| Indeno [1,2,3-cd] pyrene    | 5.05   | 0.05            | ug/L  | ND            | 101  | 50-140     |     |           |       |
| 1-Methylnaphthalene         | 4.04   | 0.05            | ug/L  | ND            | 80.7 | 50-140     |     |           |       |
| 2-Methylnaphthalene         | 4.41   | 0.05            | ug/L  | ND            | 88.2 | 50-140     |     |           |       |
| Naphthalene                 | 4.53   | 0.05            | ug/L  | ND            | 90.6 | 50-140     |     |           |       |
| Phenanthrene                | 3.98   | 0.05            | ug/L  | ND            | 79.6 | 50-140     |     |           |       |
| Pyrene                      | 4.22   | 0.01            | ug/L  | ND            | 84.4 | 50-140     |     |           |       |
| Surrogate: 2-Fluorobiphenyl | 16.5   |                 | ug/L  |               | 82.7 | 50-140     |     |           |       |
| Surrogate: Terphenyl-d14    | 22.2   |                 | ug/L  |               | 111  | 50-140     |     |           |       |
| <b>Volatiles</b>            |        |                 |       |               |      |            |     |           |       |
| Benzene                     | 31.6   | 0.5             | ug/L  | ND            | 79.1 | 60-130     |     |           |       |
| Ethylbenzene                | 34.4   | 0.5             | ug/L  | ND            | 86.0 | 60-130     |     |           |       |
| Toluene                     | 33.8   | 0.5             | ug/L  | ND            | 84.6 | 60-130     |     |           |       |
| m,p-Xylenes                 | 70.4   | 0.5             | ug/L  | ND            | 88.0 | 60-130     |     |           |       |
| o-Xylene                    | 35.9   | 0.5             | ug/L  | ND            | 89.8 | 60-130     |     |           |       |



Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

**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.



Parcel Order Number  
(Lab Use Only)

458

Chain Of Custody  
(Lab Use Only)

No 132413

|  |   |   |
|--|---|---|
| Client Name: <b>PATERSON GROUP</b>                   | Project Ref: <b>PE5434</b>  | Page <b>1</b> of <b>1</b>   |
| Contact Name: <b>Mike Beaudoin / Jesse Andrechek</b> | Quote #:  | Turnaround Time<br><input type="checkbox"/> 1 day <input type="checkbox"/> 3 day<br><input type="checkbox"/> 2 day <input checked="" type="checkbox"/> <b>Regular</b> |
| Address: <b>154 Colonnade Rd S</b>                   | PO #: <b>32095</b>  |   |
| Telephone: <b>613-226-7381</b>                       | E-mail: <b>jandrechek@patersongroup.ca</b><br><b>mbeaudoin@ " " "</b> |   |

| Regulation 153/04                                  |   | Other Regulation                           |                                    | Matrix Type: S (Soil/Sed.) GW (Ground Water)<br>SW (Surface Water) SS (Storm/Sanitary Sewer)<br>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<br>Date      Time |  | PHCs F1-F4+BTEX | VOCs | PAHs | Metals by ICP | Hg | CrVI | B (HWS) |
| <input type="checkbox"/> Table 2                   | <input checked="" type="checkbox"/> Ind/Comm                      | <input checked="" 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 type="checkbox"/> No |  | Mun: _____                         | <input type="checkbox"/> Other: _____   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| Sample ID/Location Name                            |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 1  | MW3-GW2   |  |                                    | GW  | /      | 3          | 27-SEP-21         | /                              |  | X               |      |      |               |    |      |         |
| 2  | MW6-GW2   |  |                                    | GW  | /      | 1          | 27-SEP-21         | /                              |  |                 | X    |      |               |    |      |         |
| 3  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 4  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 5  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 6  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 7  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 8  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 9  |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |
| 10   |   |  |                                    |   |        |            |                   |                                |  |                 |      |      |               |    |      |         |

|   |  |  |   |  |  |
|---|--|--|---|--|--|
| Comments:                                       |  |  | Method of Delivery: <b>PARACEL COURIER</b>      |  |  |
| Relinquished By (Sign): <i>Jesse Andrechek</i>  | Received By Driver/Depot: <i>A. Drouse</i> | Received at Lab: <i>Srineevarn Dohra</i> | Verified By: <i>GA</i>                          |  |  |
| Relinquished By (Print): <b>Jesse Andrechek</b> | Date/Time: <b>29/09/21 1:56</b>            | Date/Time: <b>Sep 29, 2021 04:00</b>     | Date/Time: <b>Sept 29 2021 5:55</b>             |  |  |
| Date/Time: <b>29-SEP-21 12PM</b>                | Temperature: _____ °C <b>71</b>            | Temperature: <b>15.8</b> °C              | pH Verified: <input type="checkbox"/> By: _____ |  |  |