February 28, 2023
File: PE4597-LET.15

Baribeau Street Development
206-900 Blvd de la Carriere
Gatineau, QC
J8Y 6T5

Attention: **Mr. Bryan Ernst**

Subject: **Phase II ESA Update**
200 Baribeau Street
Ottawa, Ontario

Consulting Engineers
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
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Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Temporary Shoring Design
Retaining Wall Design
Noise and Vibration Studies

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Dear Sir,

The following provides a narrative description of the Conceptual Site Model for the RSC Property addressed 200 Baribeau Street, in the City of Ottawa, Ontario. This narrative is to be read in conjunction with the following drawings:

- ❑ Drawing PE4597-1 – Site Plan
- ❑ Drawing PE4597-2 – Surrounding Land Use Plan
- ❑ Drawing PE4597-3 - Test Hole Location Plan
- ❑ Drawing PE4597-4 – Analytical Testing Plan – Soil (BTEX and PHCs)
- ❑ Drawing PE4597-4A – Cross-Section A-A' – Soil (BTEX and PHCs)
- ❑ Drawing PE4597-4B – Cross-Section B-B' – Soil (BTEX and PHCs)
- ❑ Drawing PE4597-5 – Analytical Testing Plan – Soil (Metals)
- ❑ Drawing PE4597-5M – Analytical Testing Plan – Soil (MeHg)
- ❑ Drawing PE4597-5A – Cross-Section A-A' – Soil (Metals)
- ❑ Drawing PE4597-5B – Cross-Section B-B' – Soil (Metals)
- ❑ Drawing PE4697-5C – Cross-Section C-C' – Soil (Metals)
- ❑ Drawing PE4597-6 – Analytical Testing Plan – Soil (PAHs)
- ❑ Drawing PE4597-6A – Cross-Section A-A' – Soil (PAHs)
- ❑ Drawing PE4597-6B – Cross-Section B-B' – Soil (PAHs)
- ❑ Drawing PE4597-7 – Analytical Testing Plan – Groundwater
- ❑ Drawing PE4597-7A - Cross-Section A-A' – Groundwater
- ❑ Drawing PE4597-8 – Contaminant Transport Diagram

1.0 Site Description

The RSC Property is located on the southwest corner of the intersection of Landry Street and Baribeau Street, in the City of Ottawa, Ontario. The RSC property is rectangular shaped lot with an area of approximately 1.26 hectares. The RSC property is surrounded by residential and parkland properties. At the time of the Phase I ESA a school was constructed on the RSC property.

2.0 Background

A Phase I ESA was completed by Paterson Group) for the RSC Property which identified multiple PCAs representing APECs on the RSC property. The APECs consisted of an on-site furnace oil tank (AST) in the basement of the school building, fill material of unknown quality throughout the RSC Property, and an adjacent private automotive service garage.

As part of the historical research a report prepared for the Ministry of Environment Ottawa District Office titled “Review of Historical Land Use in the Landry St./Baribeau St. Area, City of Vanier was reviewed. The contents of the report identified the RSC property as part of the former Dominion City Bridge Company property, with a likelihood of metals impacts to be present on the site. Fill placement, including the potential for pockets of refuse were listed as probable for the former L’Ecole Baribeau property (the RSC property), although it is also suggested that the importation of clean fill occurred as part of the school construction.

A Phase II ESA was carried out for the RSC Property in April 2019 to address these environmental concerns. Supplemental Phase II investigations were also completed in June 2019, December 2020, and December 2021 to delineate areas of impacted soil. The Phase II ESA and supplemental investigations identified impacted soil (fill material) throughout the RSC property. Groundwater testing during the Phase II ESA did not identify any impacted water on the RSC property.

A soil remediation was undertaken on the RSC property as part of the redevelopment of the site for residential purposes.

3.0 Potentially Contaminating Activity and Areas of Potential Environmental Concern

Based on the findings of the Phase I ESA, several potentially contaminating activities (PCA) were identified on the RSC property.

Area of Potential Environmental Concern (APEC)	Location of APEC on Subject Property	Potentially Contaminating Activity (PCA)	Location of PCA	Contaminants of Potential Concern (CPCs)	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC1 Former AST	Central portion of the Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site PCA1	PHCs (F_1-F_4) BTEX	Soil and Groundwater
APEC2 Fill Material of Unknown Quality	Entire RSC Property	Item 30 – Importation of Fill Material of Unknown Quality	On-Site PCA2	Metals[1] As, Se, Sb Mercury CrVI PAHs PHCs BTEX	Soil and Groundwater
APEC3[2] Application of Road Salt	Throughout the parking area on the western limits of the RSC property	Other: Application of de-icing salt for the safety of vehicular or pedestrian traffic under conditions of snow or ice	On-Site	EC SAR	Soil
APEC4 Former Landfills	Perimeter of the RSC property, excluding the west	Item 58 – Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	Off-Site PCA4	Metals[1] As, Se, Sb Mercury CrVI PAHs PHCs BTEX VOCs	Groundwater
APEC5 Existing Automotive Service Garage	South-central portion of the Phase I ESA property	Item 52 – Storage, Maintenance, Fueling and repair of equipment, vehicles, and material used to maintain transportation systems	Off-site PCA5 PCA6	PHCs (F_1-F_4) BTEX VOCs	Groundwater
APEC6 Existing AST	South-central portion of the Phase I ESA property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	Off-site PCA5 PCA6	PHCs (F_1-F_4) BTEX VOCs	Groundwater

Area of Potential Environmental Concern (APEC)	Location of APEC on Subject Property	Potentially Contaminating Activity (PCA)	Location of PCA	Contaminants of Potential Concern (CPCs)	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
1 – "Metals" refers to the method groups known as "Metals" and "Hydride forming Metals" throughout this report and all attached drawings. 2 - – In accordance with Section 49.1 of O.Reg. 153/04 standards are deemed to be met if an applicable site condition standard is exceeded at a property solely because the qualified person has determined that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. The exemption outlined in Section 49.1 is being relied upon with respect to the RSC Property					

The APECs are shown on Drawing PE4597 – 1 Site Plan. No other PCAs identified in the Phase I ESA Study Area are considered to represent an APEC on the RSC property.

APEC 1 – Existing AST: This APEC is related to the furnace oil AST, located in the basement of the former school building. The presence of this AST is considered to represent an APEC on the RSC property.

APEC 2 – Fill Material of Unknown Quality: This APEC is related to the fill material observed during aerial photo review and the Phase II ESA field programs. The presence of the fill material is considered to represent an APEC on the RSC property.

APEC3 – Application of Road Salt: It was determined during the Phase I ESA that any application of a substance to the parking area was for the purpose of the safety of vehicular or pedestrian traffic under conditions of snow or ice or both, would result in conditions that result in the applicable standard to deemed not exceeded, the exemption in Section 49.1 of O.Reg. 153/04 was relied upon for APEC 3.

APEC4 – Former Landfills: The properties surrounding the RSC property were formerly used as landfills for municipal waste. The landfilling with municipal waste occurred prior to 1945, however the waste was not remediated prior to the redevelopment with homes. The present of the former landfills are considered to represent an APEC on the RSC property.

APEC5 – Automotive Service Garage: This APEC is related to an observed private automotive service garage along the south property line of the subject site. The presence of the private automotive service garage is considered to represent an APEC on the RSC property.

APEC6 – Existing AST: Adjacent to APEC5, an AST is present. The observed AST is considered to represent an APEC on the RSC property.

Several other PCAs were observed in the Phase I ESA study area, however based on the separation distance and the nature of the PCA, they are not considered to represent an APEC on the RSC property.

4.0 Contaminants of Potential Concern

Based on the findings of the Phase I and Phase II ESA, the following Contaminants of Potential Concern (CPCs) were identified on the RSC Property:

Soil

- ❑ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❑ Petroleum Hydrocarbons, (PHC F_1-F_4);
- ❑ Metals (including As, Se, Sb)
- ❑ Mercury (Hg);
- ❑ Hexavalent Chromium (CrVI);
- ❑ Polycyclic Aromatic Hydrocarbons (PAHs).

Groundwater

- ❑ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❑ Petroleum Hydrocarbons, (PHC F_1-F_4);
- ❑ Volatile Organic Compounds (VOCs);
- ❑ Metals (including As, Se, Sb)
- ❑ Mercury (Hg);
- ❑ Hexavalent Chromium (Cr^{VI});
- ❑ Polycyclic Aromatic Hydrocarbons (PAHs).

5.0 Subsurface Structures and Utilities

Underground service locates were completed prior to the subsurface investigations. Public utility services are present along the Baribeau Street frontage. Private utilities, including catch basins for storm sewers and electrical service trenches are present on the west side of the property. Underground utilities, both public and private, have been decommissioned on the RSC property. The utility trenches are not expected to affect contaminant distribution and transport, based their shallow depth and the nature of the contaminants.

Based on standard practice for subsurface utility installation, service trenches are expected to be present approximately 1 to 2 m below existing grade. In general, trench backfill may provide a preferential pathway for contaminant transport if the water table is at or above the base of the trenches.

Based on the findings of the Phase II ESA, the underground services are not considered to have created preferential pathways for contaminant migration.

6.0 Physical Setting

6.1 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:

- Intermittent asphaltic concrete or concrete ground cover, varying in thickness from 0.05 to 0.10 m.
- Fill, consisting of brown silty sand with trace silt, clay, gravel, cobbles, glass, metal, and construction debris, varying in thickness from 0.20 to 2.44 m. The fill material is not expected to be a significant water bearing unit at the RSC Property.
- An intermittent layer of topsoil was observed at the surface, and/or below the fill material. This layer varied in thickness from 0.15 to 0.8 m. The intermittent topsoil layer is not considered to be a significant water bearing unit.
- An intermittent layer of soil consisting of sandy silt, silty sand, or silty clay. This layer varied in thickness from 0.25 to 0.91 m. This intermittent upper native layer is not considered to be a significant water bearing unit. This layer is considered to be the upper native soil on the RSC property where present.
- Glacial till, consisting of brown silty sand to silty clay, with some gravel, cobbles, and boulders, was identified beneath the fill material, intermittent sandy silt, silty sand, or silty clay material, and/or topsoil on the RSC property. The glacial till is considered to be native soil on the RSC property. The glacial till layer is considered to be the main aquifer on the RSC property.
- Bedrock was not encountered during the field investigation, although A DCPT test advanced in BH4 met practical refusal at 6.35 m below ground surface. Coring was not completed to confirm bedrock surface

6.2 Hydrogeological Characteristics

Based on observed soil conditions and groundwater elevations measured during the groundwater sampling program the groundwater is considered to be present within an unconfined aquifer present within the glacial till and lower fill layer at the RSC property.

A groundwater contour map was completed and the horizontal hydraulic gradient for the subject site was calculated. Groundwater flow at the RSC Property was in a northerly direction, with a horizontal hydraulic gradient of 0.007m/m as part of the Phase II ESA investigations.

Supplemental groundwater monitoring wells were installed following the soil remediation on the RSC property for the purposes of assessing groundwater impacts from off-site environmental concerns. The groundwater flow direction from the supplemental investigative work indicates a groundwater flow in the southwesterly direction, with a hydraulic gradient of 0.01 m/m.

The differences in groundwater flow direction are considered to be attributable to the remediation excavation and removal of the impermeable layer which covered the majority of the site as part of its original development following the Phase II ESA. Based on the regional topography and the nearest body of water, the regional groundwater is expected to flow to the west, towards the Rideau River. Localized variations in the groundwater flow direction are not considered to have impacted the results and conclusions of the Phase I and II ESA.

The groundwater contours for the subject site are shown on Drawing PE4597-3 – Test Hole Location Plan.

Approximate Depth to Bedrock

A DCPT test advanced in BH4 met practical refusal at 6.35 m below ground surface. This depth is consistent with geological mapping in the area. Bedrock was not encountered in any other boreholes or test pits on the RSC Property.

Approximate Depth to Water Table

The depth to the water table on the RSC Property was approximately 0.85 to 1.55 m below the existing ground surface.

6.3 Section 35 of the Regulation

Section 35 of the Regulation applies to the RSC property as follows;

❒ The property, and all other properties located, in whole or in part, within 250 m of the boundaries of the subject property are supplied by the municipal drinking water system, as defined in the Safe Drinking Water Act, 2002.

❒ The RSC does not specify agricultural or other use as the type of property use for which the RSC is filed.

❒ The RSC property is not located in an area designated in the municipal official plan as a well-head protection area of other designation identified by the municipality for protection of groundwater.

❒ Neither the RSC property nor any of the properties within the surrounding area have a well used or intended for use as a source of water for human consumption or agriculture.

❒ The QP has given the clerk of the municipality written notice of intention to apply standards in preparing a record of site condition for the property and the municipality has not given written notice to the QP that they object to the application of the standards within 30 days.

6.4 Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation does not apply to the RSC property, in that the subject property is not located within 30 m of an environmentally sensitive area, and the pH of the surface and subsurface soils are between 5 and 9.

Section 43.1 of the Regulation does not apply to the RSC property, in that the bedrock is situated at a depth of greater than 2 m below ground surface, and the RSC property does not include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

Based on an evaluation of the requirements of Sections 35, 41, and 43.1 the site condition standards for the RSC property are considered to be the Table 3 Residential Coarse Grained Standards.

6.5 Water Bodies and Areas of Natural and Scientific Interest

No water bodies or areas of natural and scientific interest (ANSI) were identified on or within 250 m of the RSC property.

6.6 Existing Buildings and Structures

A former school building was present on the RSC property at the time of the Phase I ESA. The school building was constructed during the 1950s and remained in use until it was demolished for redevelopment purposes. A storage shed was located on the RSC property. The storage shed was used for storage of athletic equipment by both the school and community associations. The shed was demolished as part of the redevelopment of the RSC property. The locations of the former structures are presented on Drawing PE4597-1 – Site Plan.

6.7 Proposed Buildings

A multi-unit semi-detached residential development and park area has been proposed for the RSC property. At this time the exact layout of the development has not been made available.

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

Fill material was identified in all boreholes and test pits from Phase II ESA investigation and supplemental delineation investigations. The impacted fill material is considered to be the result of historical fill placement.

Based on the analytical test results from the Phase II ESA and supplemental investigations, the impacted fill material is present across the entire RSC property.

No fill material was imported to the site as part of the Phase II ESA or during the remedial activities, other than crushed stone/engineered fill for the purposes of site grading. The crushed stone is not considered to be soil. No excess soil was brought to the RSC property.

7.0 Environmental Condition

7.1 Areas Where Contaminants are Present

Based on the analytical test results of the Phase II ESA and supplemental investigations, impacted soil is present in the fill material across the entire RSC property.

Fill Material

Impacted fill material was identified throughout the RSC property, including within the former building footprints. The impacted material extended from surface to a maximum of 3.0 m below the existing grade. No other impacted soil was identified during the Phase II ESA or remediation work.

No groundwater exceedances are present on the RSC property.

Sample locations are illustrated with analytical results in the attached analytical testing plans.

7.2 Types of Contaminants

Based on the results of the analytical testing contaminants of concern on the RSC property are considered to be the following.

Soil

- ❑ Mercury (Hg)
- ❑ Antimony
- ❑ Arsenic
- ❑ Barium
- ❑ Boron

- ❑ Cadmium
- ❑ Cobalt
- ❑ Copper
- ❑ Lead
- ❑ Molybdenum
- ❑ Nickel
- ❑ Selenium
- ❑ Thallium
- ❑ Vanadium
- ❑ Zinc
- ❑ Acenaphthylene
- ❑ Anthracene
- ❑ Benzo[a]anthracene
- ❑ Benzo[a]pyrene
- ❑ Benzo[b]fluoranthene
- ❑ Benzo[g,h,i]perylene
- ❑ Benzo[k]fluoranthene
- ❑ Chrysene
- ❑ Dibenzo[a,h]anthracene
- ❑ Fluoranthene
- ❑ Indeno[1,2,3-cd]pyrene
- ❑ Methylnaphthalene (1&2)
- ❑ Naphthalene
- ❑ Phenanthrene

All contaminant concentrations in the groundwater beneath the subject property are in compliance with the selected MECP Table 3 Residential Standards.

7.3 Contaminated Media

Based on the results of the Phase II ESA the fill material across the entire RSC Property, as well as some upper native material is impacted above the MECP Table 3 Standards for an array of Metals and/or PAH parameters.

The groundwater beneath the RSC Property complies with the MECP Table 3 Standards.

7.4 What is Known About Areas Where Contaminants are Present

The impacted fill material and upper native material is considered to be a result of the historical placement of poor-quality fill material throughout the RSC property.

7.5 Distribution of Contaminants

The horizontal distribution of contaminants exceeding the MECP Table 3 Standards prior to remediation are shown on the following drawings:

- ❒ Drawing PE4597-5 – Soil (Metals)

Based on the analytical testing and site observations the metal impacted fill material is present throughout the RSC property, extending to the property lines in all directions. The metals exceedances are considered to be horizontally delineated by the property lines. All soil to the property boundaries have been removed and no soil samples were able to be collected.

- ❒ Drawing PE4597-6 – Soil (PAHs)

Based on the analytical testing and site observations the PAH impacted fill material is present throughout the RSC property, extending to the property lines in all directions. The PAH exceedances are considered to be horizontally delineated by the property lines. All soil to the property boundaries have been removed and no soil samples were able to be collected.

The approximate vertical distribution of contaminants exceeding the MECP Table 3 Standards prior to remediation are shown on the following drawings:

- ❒ Drawing PE4597-5A - Cross-Section A-A' – Soil (Metals)
- ❒ Drawing PE4597-5B – Cross-Section B-B' – Soil (Metals)

The metals exceedances throughout the property were excavated as part of the redevelopment of the property. The impacted material was delineated vertically by both supplemental field investigations and confirmatory sampling at the time of remediation. Base samples BS-B3-1, BHD3-1, BS-E1-1, BS-G1-1, BS-G2-1, BS-F2-1, BS-F4-1, BS-G4-1, BS-E6-1, BS-G10-1, BS-G10-2, BSC10-3, and BS-A9-1 are considered to vertically delineate the previous exceedances. Based on the vertical delineation samples the impacted soil is considered to have been removed from the RSC property.

- ❒ Drawing PE4597-6A – Cross-Section A-A' – Soil (PAHs)
- ❒ Drawing PE4597-6B – Cross-Section B-B' – Soil (PAHs)

The PAH exceedances throughout the property were excavated as part of the redevelopment of the property. The impacted material was delineated vertically by both supplemental field investigations and confirmatory sampling at the time of remediation. Base samples BS-B3-1, BHD3-1, BS-E1-1, BS-G1-1, BS-G2-1, BS-F2-1, BS-F4-1, BS-G4-1, BS-E6-1, BSC10-3, and BS-A9-1 are considered to vertically delineate the previous exceedances. Based sample BS-G10-1 originally exceeded the applicable SCS. A supplemental excavation was carried out and sample BS-G10-2 was collected to

vertically delineate the impact. Based on the vertical delineation samples the impacted soil is considered to have been removed from the RSC property.

7.6 Discharge of Contaminants

The discharge of contaminants is considered to be a result of the historical use of the site to place poor quality fill material.

7.7 Migration of Contaminants

The contaminants are considered to be isolated in the fill material. Based on the base sampling results, the nature of the contaminants, and the limited groundwater sampling completed at the RSC property contamination migration appears to not be a concern.

7.8 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, the contaminated areas appear to be restricted to the overburden soils, and as such, the aforementioned climatic and meteorological conditions are not considered to have affected contaminant distribution at the RSC property.

7.9 Potential for Vapour Intrusion

The potential for vapour intrusion at the RSC property is considered to have been low given the nature of the impacts (Metals and PAHs).

As part of the site redevelopment for the proposed development, all impacted soil on the RSC property has been excavated and disposed off-site, and no impacted groundwater was identified beneath the RSC property. As such, there is no anticipated potential vapour intrusion into future subsurface structures and utilities at the RSC property.

7.10 Contaminant Distribution Diagram

<u>Contaminant Transport Pathways</u>

Physical transport – one potential contaminant transport pathway is the physical transport from one location to another of impacted soil, either intentionally or unintentionally, by earth moving equipment, vehicle traffic, or pedestrian traffic. The potential for physical transport of contaminants to have occurred on the RSC Property is considered to be low.

Precipitation/Infiltration/Leaching – As precipitation falls on the ground surface and subsequently infiltrates through the soil to the groundwater table, there is the potential for contaminants in the soil phase to enter the groundwater, depending on the solubility of the contaminants.

As the RSC Property was mostly paved or occupied by buildings, with the exception of small landscaped areas, the potential for infiltration and leaching due to precipitation is very low.

Given that the groundwater beneath the RSC Property complies with the MECP Table 3 standards no significant contaminant transport is considered to have occurred at the RSC Property.

Human and Ecological Receptors

Human Receptors - Potential human receptors are considered to be limited to construction workers and environmental professionals who may contact the soil during the remediation and/or rehabilitation of the site. The site is located in a municipally serviced area.

Ecological Receptors – There are no significant potential ecological receptors are present on the RSC Property as the property is mostly covered by paved areas. No significant potential ecological receptors are present downgradient of the RSC Property given the urban setting of the RSC Property.

Receptor Exposure Points

Human Receptors – Exposure points for human receptors consist of remedial excavations.

Ecological Receptors – In general, the most likely exposure points for ecological receptors include the root zones of plants and the burrows of burrowing wildlife. As noted above there was limited potential for contact with ecological receptors on the RSC Property.

Routes of Exposure

Human Receptors – Routes of exposure for human receptors (construction works and environmental professionals) include dermal contact, accidental ingestion and inhalation.

Ecological Receptors – Routes of exposure for ecological receptors include ingestion, dermal contact and inhalation. There are no potential ecological receptors as discussed above due to the site being covered with paved areas as well as being situated in an urban setting. Furthermore, groundwater at the RSC Property complies with the site standards.

Refer to Drawing PE4597-8 – Contaminant Distribution Diagram which illustrates and provides narrative notes explaining the contaminant release mechanisms, contaminant transport pathways, human and ecological receptors, receptor exposure points, and routes of exposure at the RSC Property.

8.0 Environmental Remediation Program

Paterson Group monitored an environmental remediation program at the RSC property between February and August 2022. Based on the existing analytical data, the impacted soil was identified and removed from the RSC property. The impacted material was delineated using the existing boreholes and test pits and removed from the property. Approximately 57,958mt of impacted fill material was removed from the RSC property for off-site disposal at the Waste Connections Canada Navan Road Landfill.

No impacted groundwater was encountered during the soil removal program. Following the environmental remediation program supplemental monitoring wells were installed to confirm the groundwater quality. All groundwater is in compliance with the MECP Table 3 Standards.

No excess soil was brought from another property and placed on, in or under the RSC property as part of the environmental remediation program.

We trust this information satisfies your requirements.

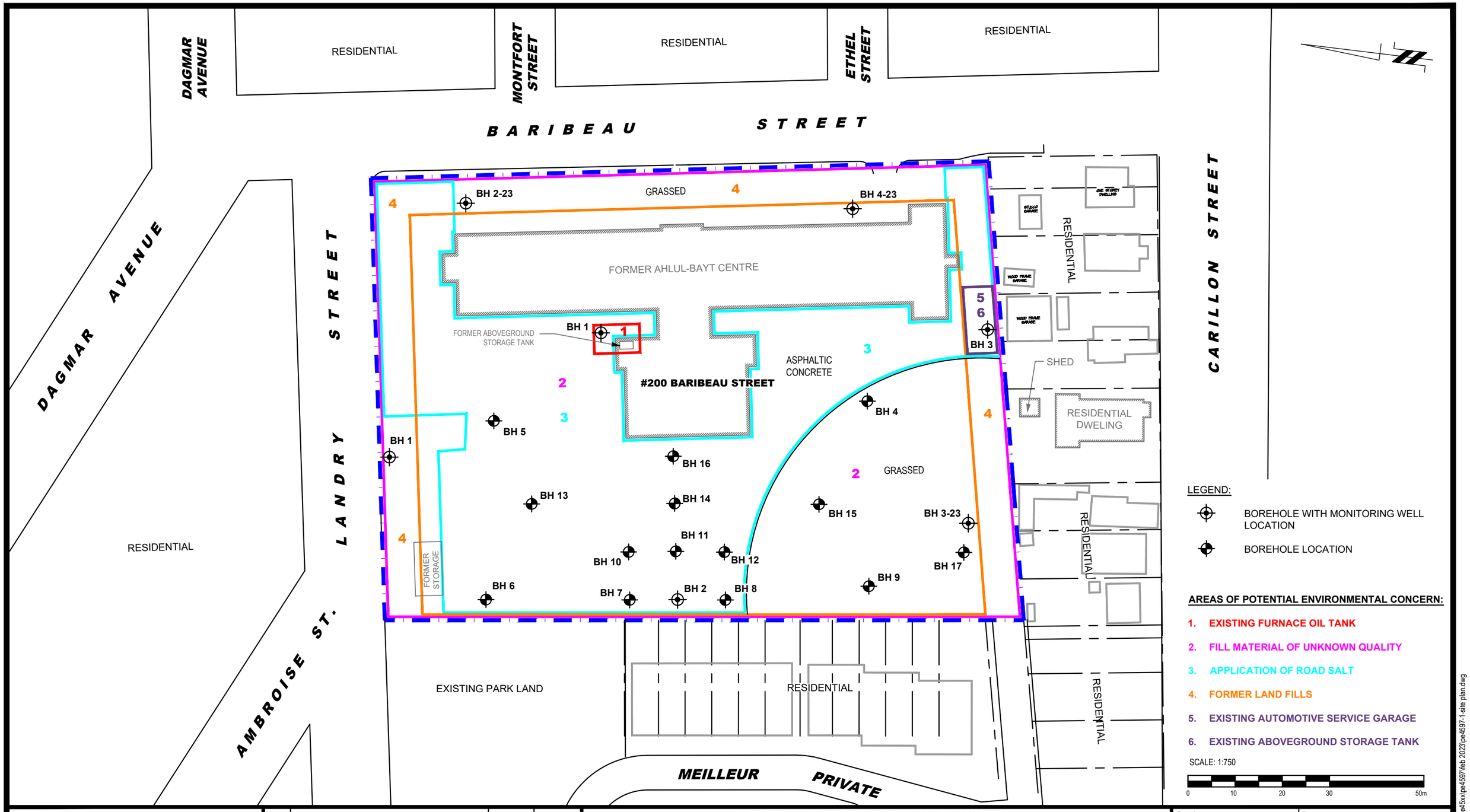
Best Regards,

Paterson Group Inc.





Michael Beaudoin, P.Eng. QP$_{ESA}$



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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

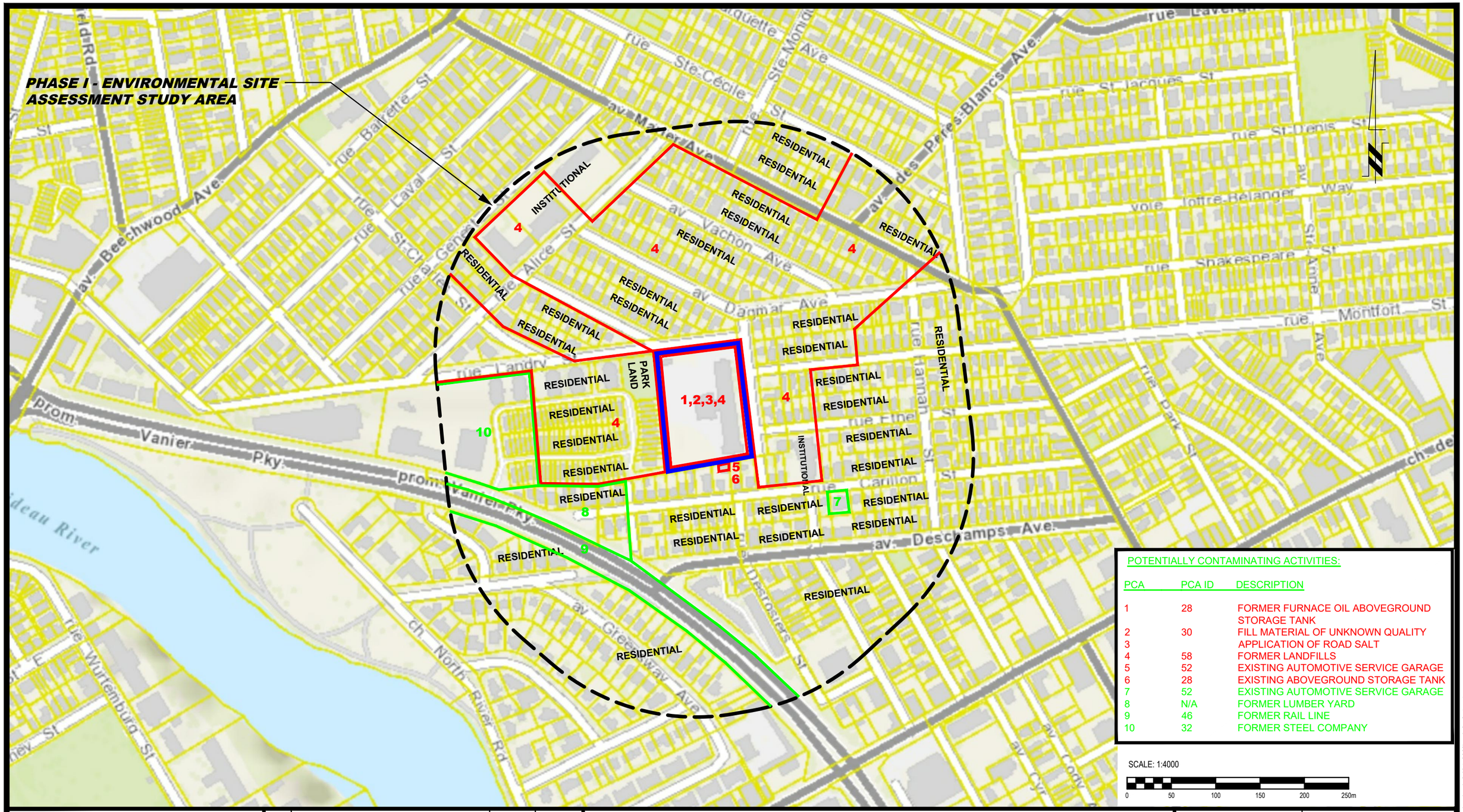
OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:750	Date: 02/2023
Drawn by: MPG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-1
Approved by: MB	Revision No.:

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POTENTIALLY CONTAMINATING ACTIVITIES:

PCA	PCA ID	DESCRIPTION
1	28	FORMER FURNACE OIL ABOVEGROUND STORAGE TANK
2	30	FILL MATERIAL OF UNKNOWN QUALITY
3		APPLICATION OF ROAD SALT
4	58	FORMER LANDFILLS
5	52	EXISTING AUTOMOTIVE SERVICE GARAGE
6	28	EXISTING ABOVEGROUND STORAGE TANK
7	52	EXISTING AUTOMOTIVE SERVICE GARAGE
8	N/A	FORMER LUMBER YARD
9	46	FORMER RAIL LINE
10	32	FORMER STEEL COMPANY

SCALE: 1:4000

0 50 100 150 200 250m

PATERSON GROUP
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OTTAWA, ON
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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	UPDATED SITE BOUNDARY	02/12/2021	MB

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET AND 127 CARILLON STREET

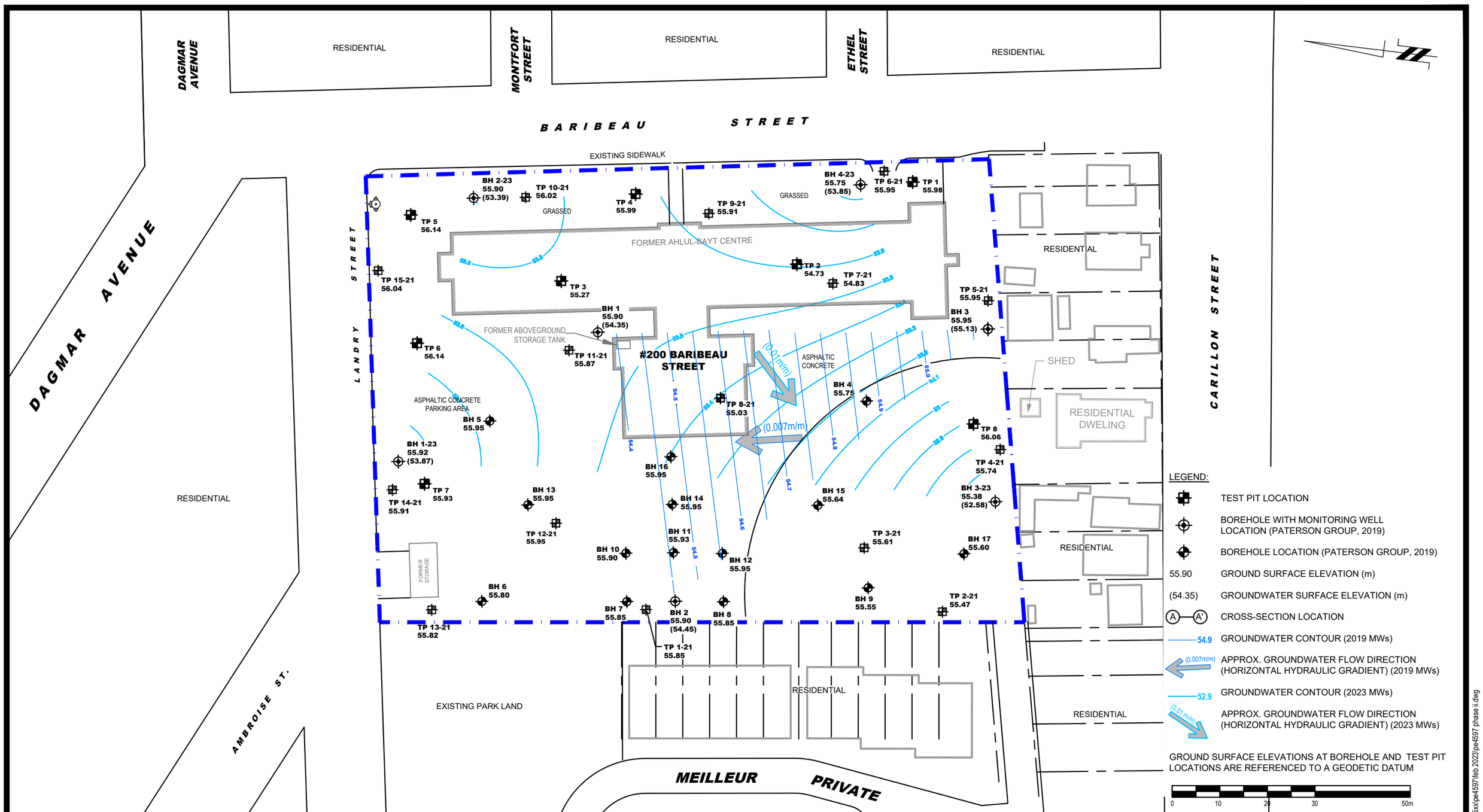
OTTAWA, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:4000	Date: 02/2023
Drawn by: MPG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-2
Approved by: MB	Revision No.: 1

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NO.	REVISIONS	DATE	INITIAL
1	UPDATED SITE BOUNDARY NEW 2020 TEST PITS ADDED	02/12/2021	MB

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:750	Date: 06/2019
Drawn by: MPG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-3
Approved by: MB	Revision No.: 1

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DAGMAR AVENUE

MONTFORT STREET

ETHEL STREET

CARILLON STREET

LANDRY STREET

AMBROISE ST.

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

EXISTING PARK LAND

BARIBEAU STREET

GRASSED

GRASSED

FORMER AHLUL-BAYT CENTRE

BOVEGROUND STORAGE TANK

ASPHALTIC CONCRETE

#200 BARIBEAU STREET

SHED

RESIDENTIAL DWELING

FORMER STORAGE

A

A'

B

B'

TP10-21-02 2.2-2.6 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP9-21-02 2.4-2.6 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP6-21-01 1.3-2.4 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-A9-1 2.5-2.6 m 18-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-B3-1 2.5-2.6 m 28-FEB-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP15-21-02 2.4-2.8 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP11-21-02 2.6-3.0 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-D3-1 3.1-3.2 m 16-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BH1-SS3 1.52-2.26 m 22-APR-2019
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-C6-1 3.1-3.2 m 9-MAR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP5-21-02 2.2-2.5 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-C10-3 2.5-2.6 m 31-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP8-21-02 1.5-2.0 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-E6-1 1.8-1.9 m 31-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP4-21-02 2.0-2.4 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-E1-1 3.1-3.2m 18-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP14-21-02 2.5-2.9 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-F4-1 2.5-2.6 m 31-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP3-21-02 2.1-2.4 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-F2-1 2.5-2.6 m 18-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-G2-1 2.5-2.6 m 31-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-G1-1 2.5-2.6 m 18-MAY-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP13-21-02 2.5-2.8 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-G4-1 2.3-2.4 m 15-MAR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-C6-1 3.1-3.2 m 9-MAR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP1-21-02 2.3-2.4 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

TP2-21-02 2.2-2.4 m 2-DEC-2021
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-G10-2 1.8-1.9 m 23-MAR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BS-G10-1 1.6-1.7 m 9-MAR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BH 2-23 55.90 (53.39)
TP 10-21 56.02
TP 5 56.14
TP 15-21 56.04
TP 6 56.14
TP 11-21 55.87
BH 1 55.90 (54.35)
TP 3 55.27
TP 4 55.99
TP 9-21 55.91
BH 4-23 55.75 (53.85)
TP 6-21 55.95
TP 1 55.98
TP 2 54.73
TP 7-21 54.83
TP 5-21 55.95
BH 3 55.95 (55.13)
TP 8-21 55.03
BH 4 55.75
BH 5 55.95
TP 8 56.06
TP 4-21 55.74
BH 1-23 55.92 (53.87)
TP 7 55.93
TP 14-21 55.91
BH 13 55.95
BH 16 55.95
BH 14 55.95
BH 15 55.64
BH 3-23 55.38
TP 3-21 55.61
BH 17 55.60
TP 12-21 55.95
BH 11 55.93
BH 10 55.90
BH 12 55.95
BH 6 55.80
TP 13-21 55.82
BH 7 55.85
BH 2 55.90 (54.45)
BH 8 55.85
TP 1-21 55.85
BH 9 55.55
TP 2-21 55.47

LEGEND:

- TEST PIT LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (PATERSON GROUP, 2019)
- BOREHOLE LOCATION (PATERSON GROUP, 2019)
- ANALYZED SOIL GRAB SAMPLE
- 98.70 GROUND SURFACE ELEVATION (m)
- (97.15) GROUNDWATER SURFACE ELEVATION (m)
- A — A' CROSS-SECTION LOCATION
- RSC PROPERTY

GROUND SURFACE ELEVATIONS AT BOREHOLE AND TEST PIT LOCATIONS ARE REFERENCED TO A GEODETIC DATUM

SOIL SAMPLE RESULT IN COMPLIANCE WITH MECP TABLE 3 STANDARDS

SOIL SAMPLE RESULT EXCEEDS MECP TABLE 3 STANDARDS

0 1 2 3 4 5 10 15 20m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
0			

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

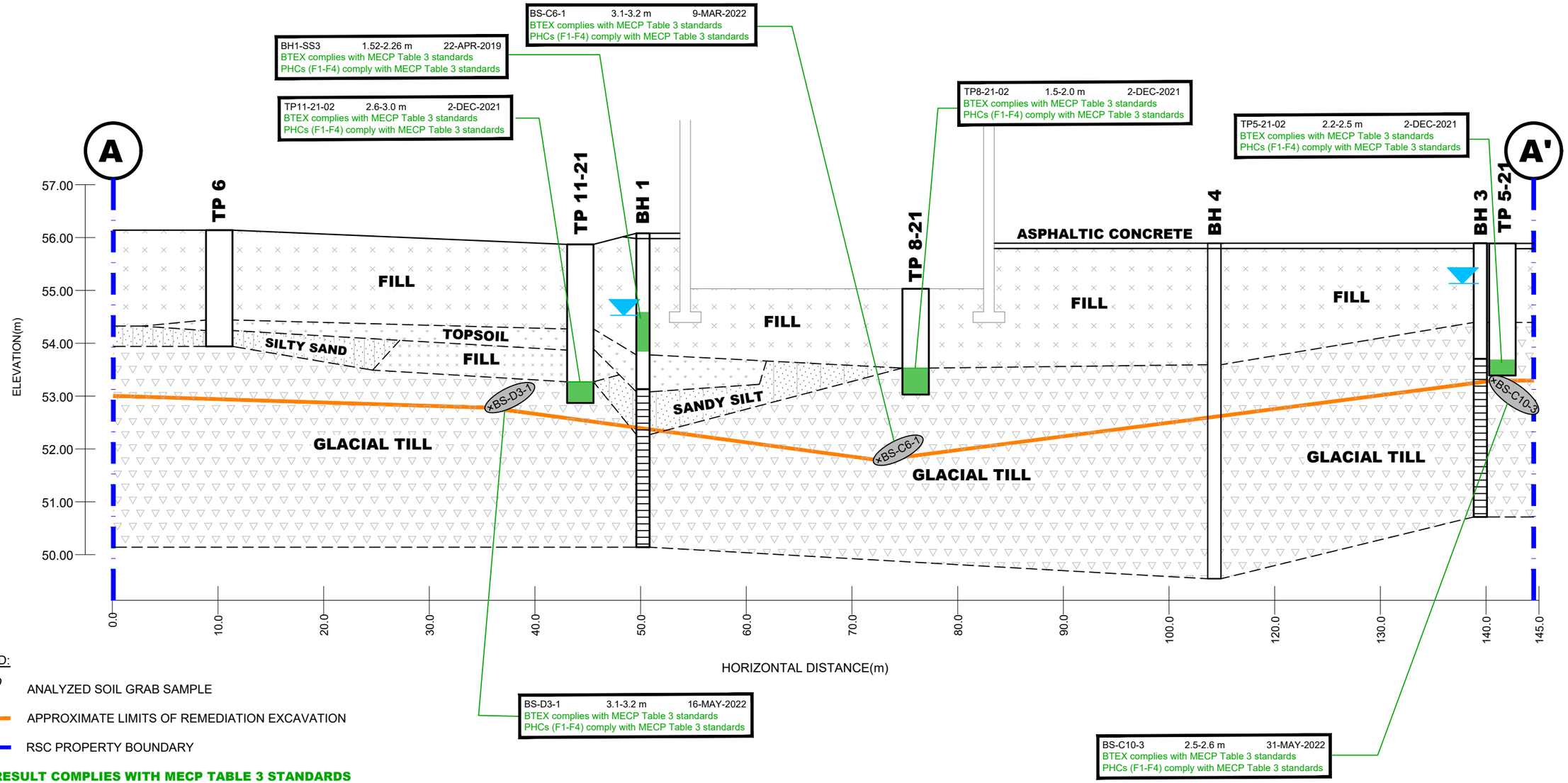
Title:

ANALYTICAL TESTING PLAN - SOIL (BTEX,PHCs)

Stamp:

Scale:	1:300
Drawn by:	RCG
Checked by:	MB
Approved by:	MB
Date:	07/2022
Report No.:	PE4597-2
Drawing No.:	PE4597-4
Revision No.:	1

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LEGEND:

×BS-D3-1 ANALYZED SOIL GRAB SAMPLE

APPROXIMATE LIMITS OF REMEDIATION EXCAVATION

RSC PROPERTY BOUNDARY

SOIL RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

PATERSON GROUP
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OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

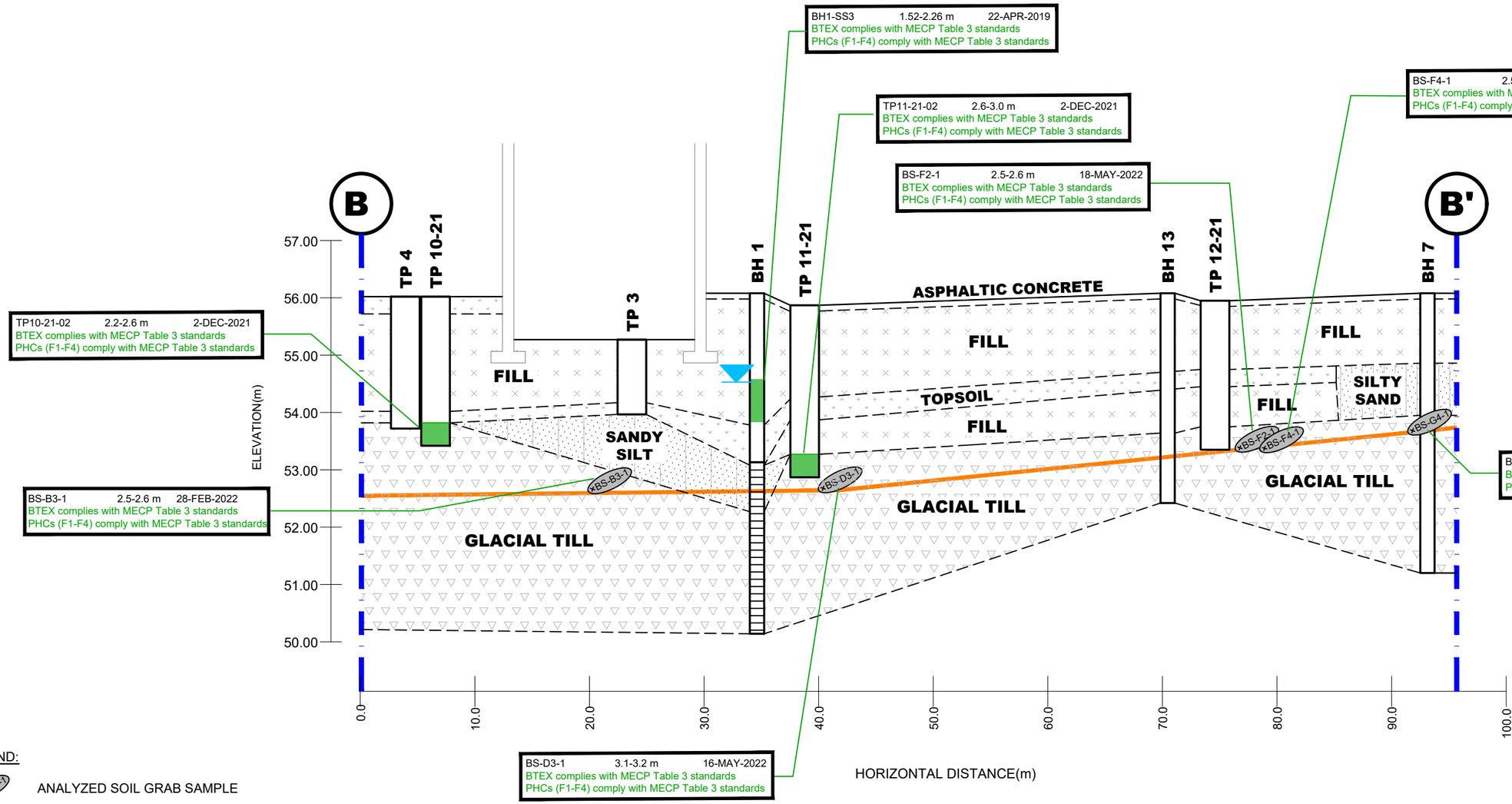
OTTAWA, ONTARIO

Title:

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

Scale: AS SHOWN	Date: 09/2022
Drawn by: RCG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-4A
Approved by: MB	Revision No.:

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LEGEND:

- ANALYZED SOIL GRAB SAMPLE (BS-D3-1)
- APPROXIMATE LIMITS OF REMEDIATION EXCAVATION
- RSC PROPERTY BOUNDARY

SOIL RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

PATERSON GROUP
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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

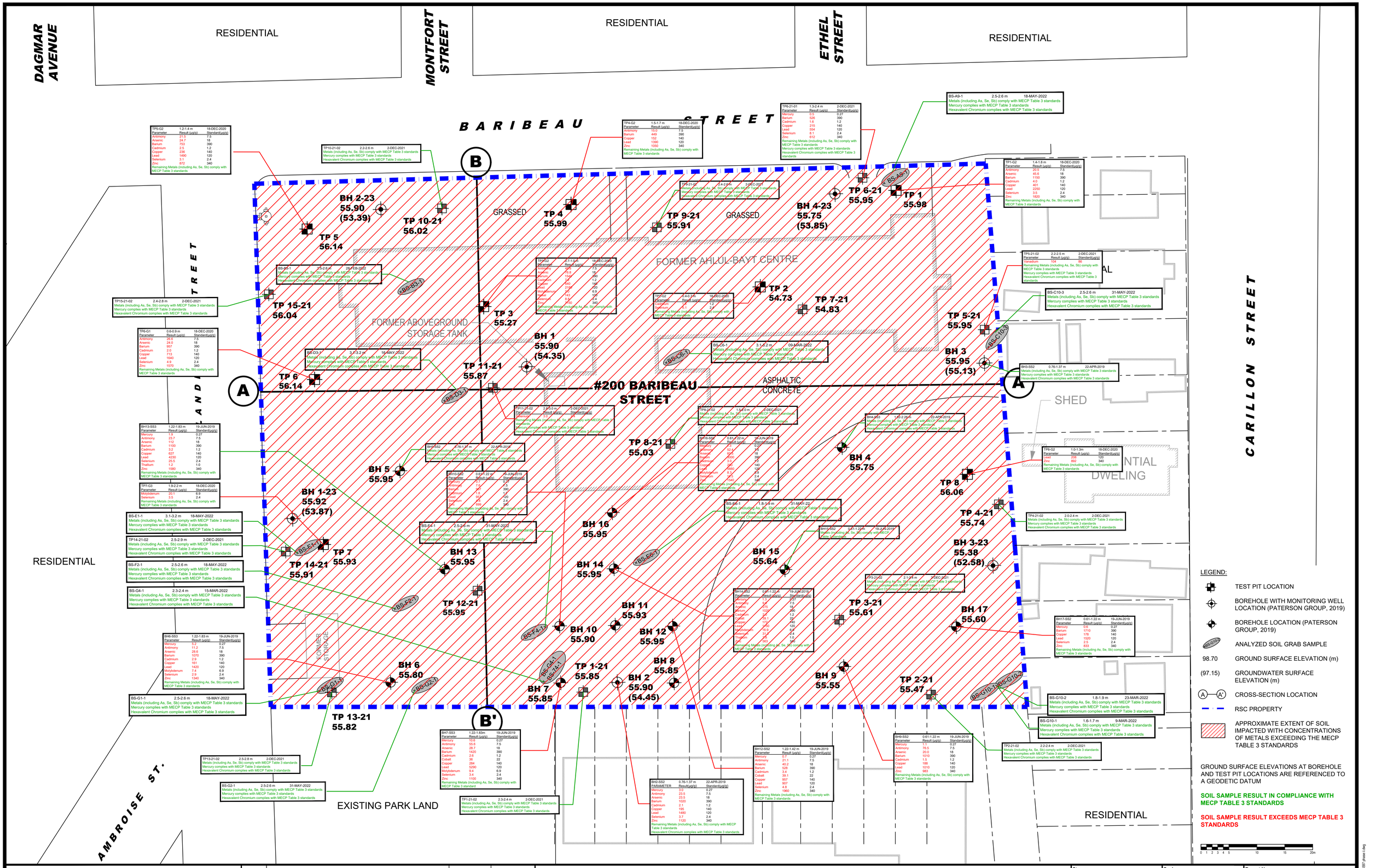
OTTAWA, ONTARIO

Title:

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

Scale: AS SHOWN	Date: 09/2022
Drawn by: RCG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-4B
Approved by: MB	Revision No.:

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PATERSON GROUP
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OTTAWA, ON
K2E 7S9
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NO.	REVISIONS	DATE	INITIAL
0			

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

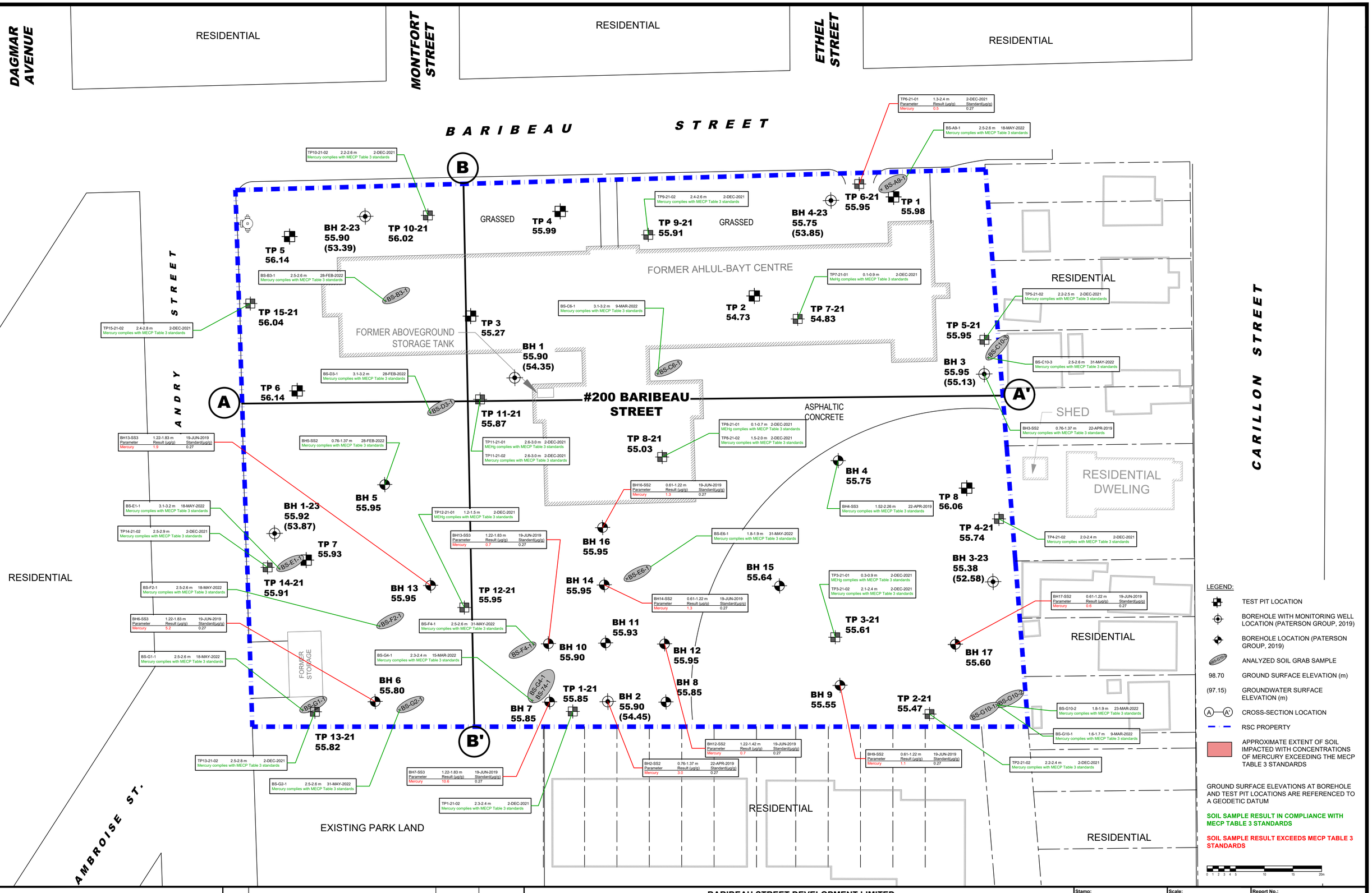
Title:

ANALYTICAL TESTING PLAN - SOIL (METALS)

Stamp:

Scale:	1:300
Drawn by:	RCG
Checked by:	MB
Approved by:	MB
Date:	07/2022
Report No.:	PE4597-2
Drawing No.:	PE4597-5
Revision No.:	1

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PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
0			

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

Title:

ANALYTICAL TESTING PLAN - SOIL (MERCURY)

Stamp:

Scale:	1:300
Drawn by:	RCG
Checked by:	MB
Approved by:	MB
Date:	07/2022
Report No.:	PE4597-2
Drawing No.:	PE4597-5M
Revision No.:	

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TP15-21-02 2.4-2.8 m 2-DEC-2021
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

TP6-G1 0.6-0.9 m 18-DEC-2020

Parameter	Result (µg/g)	Standard(µg/g)
Antimony	26.6	7.5
Arsenic	24.0	18
Barium	957	390
Cadmium	2.0	1.2
Copper	713	140
Lead	1640	120
Selenium	4.9	2.4
Zinc	1570	340

Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards

BS-C6-1 3.1-3.2 m 09-MAR-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BH4-SS3 1.52-2.26 m 22-APR-2019
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

TP11-21-02 2.6-3.0 m 2-DEC-2021

Parameter	Result (µg/g)	Standard(µg/g)
Selenium	3.0	2.4

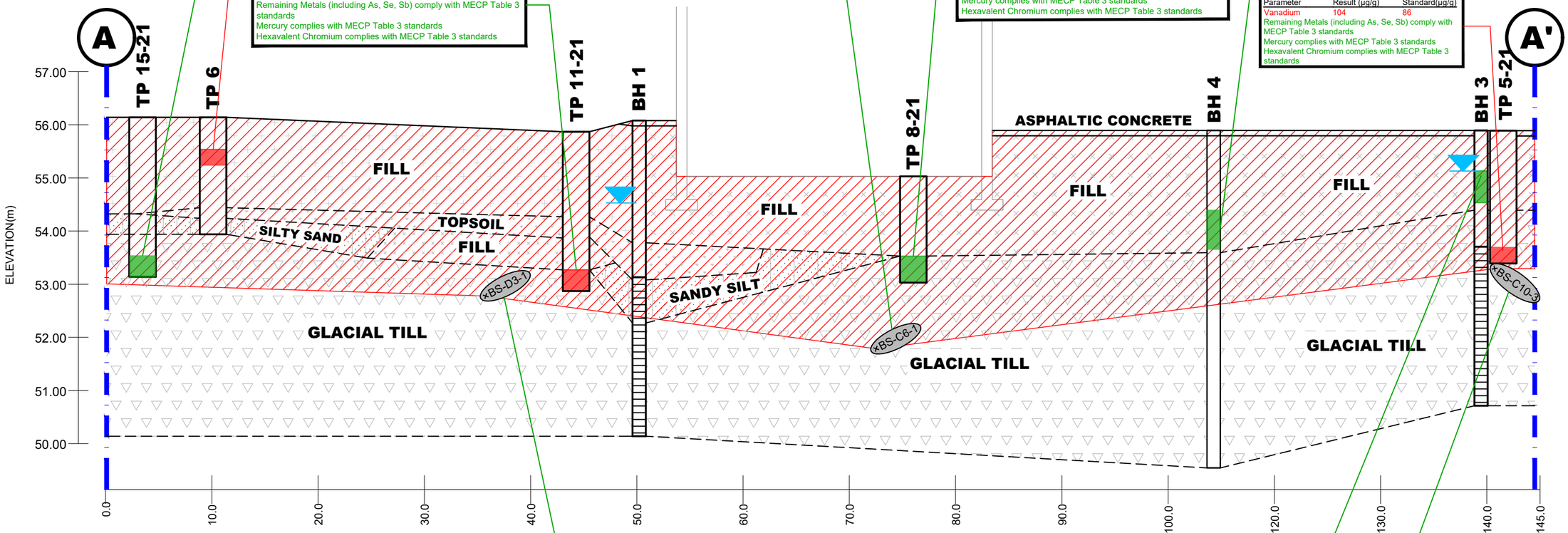
Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

TP8-21-02 1.5-2.0 m 2-DEC-2021
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

TP5-21-02 2.2-2.5 m 2-DEC-2021

Parameter	Result (µg/g)	Standard(µg/g)
Vanadium	104	86

Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards



BS-D3-1 3.1-3.2 m 16-MAY-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BH3-SS2 0.76-1.37 m 22-APR-2019
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BS-C10-3 2.5-2.6 m 31-MAY-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

LEGEND:

×BS-D3-1 ANALYZED SOIL GRAB SAMPLE

APPROXIMATE EXTENT OF SOIL IMPACTED WITH CONCENTRATIONS OF METALS EXCEEDING THE MECP TABLE 3 STANDARDS

SOIL RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET
OTTAWA, ONTARIO

Title:
CROSS SECTION A-A' - SOIL (METALS)

Scale: AS SHOWN	Date: 092022
Drawn by: RCG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-5A
Approved by: MB	Revision No.:

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TP3-G2	0.7-1.0 m	18-DEC-2020
Parameter	Result (µg/g)	Standard(µg/g)
Antimony	45.6	7.5
Arsenic	76.8	18
Barium	1540	390
Cadmium	7.2	1.2
Copper	640	140
Lead	2180	120
Molybdenum	7.0	6.9
Nickel	143	100
Selenium	8.8	2.4
Zinc	7150	340

Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards

TP4-G2	1.5-1.7 m	18-DEC-2020
Parameter	Result (µg/g)	Standard(µg/g)
Antimony	15.0	7.5
Barium	449	390
Copper	152	140
Lead	1390	120
Zinc	1050	340

Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards

TP10-21-02 2.2-2.6 m 2-DEC-2021
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BS-B3-1 2.5-2.6 m 28-FEB-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

TP11-21-02	2.6-3.0 m	2-DEC-2021
Parameter	Result (µg/g)	Standard(µg/g)
Selenium	3.0	2.4

Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BS-F2-1 2.5-2.6 m 18-MAY-2022
PAHs comply with MECP Table 3 standards

BS-F4-1 2.5-2.6 m 31-MAY-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BH7-SS3	1.22-1.83m	19-JUN-2019
Parameter	Result (µg/g)	Standard(µg/g)
Mercury	10.6	0.27
Antimony	55.6	7.5
Arsenic	28.7	18
Barium	1420	390
Cadmium	2.6	1.2
Cobalt	36	22
Copper	284	140
Lead	5290	120
Molybdenum	9.4	6.9
Selenium	3.4	2.4
Zinc	1100	340

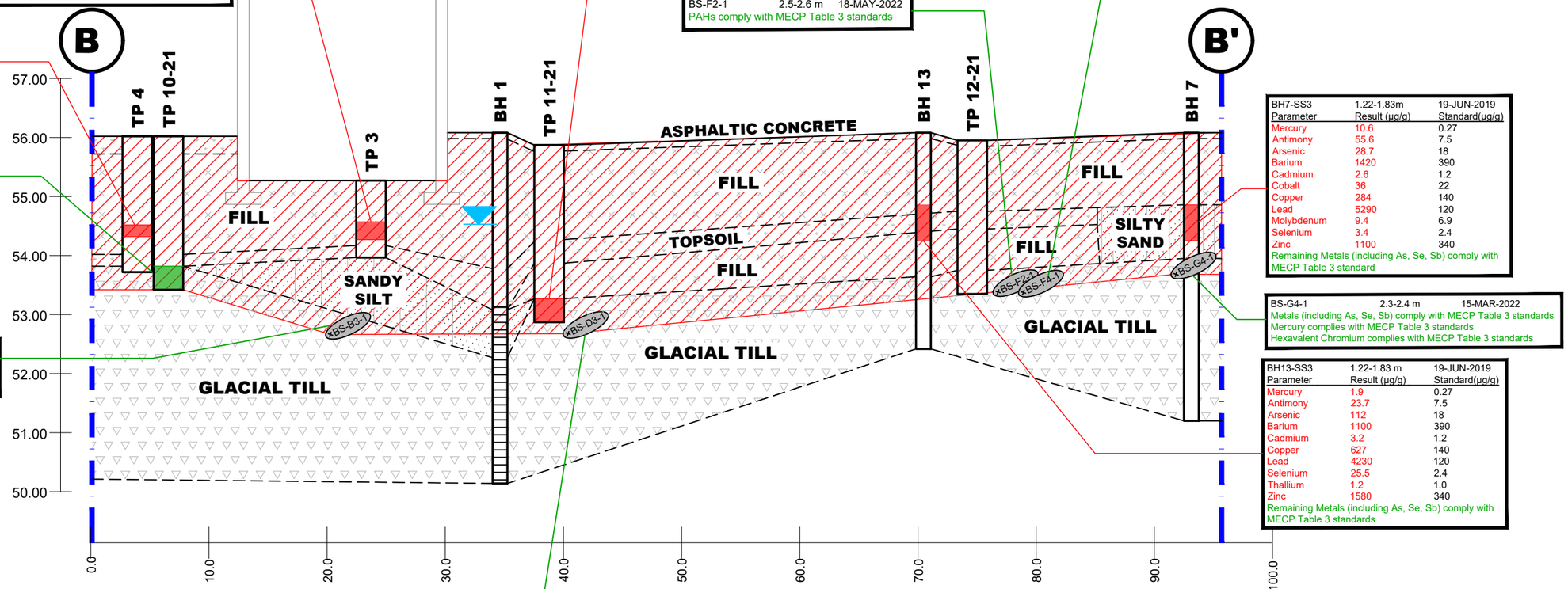
Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standard

BS-G4-1 2.3-2.4 m 15-MAR-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards

BH13-SS3	1.22-1.83 m	19-JUN-2019
Parameter	Result (µg/g)	Standard(µg/g)
Mercury	1.9	0.27
Antimony	23.7	7.5
Arsenic	112	18
Barium	1100	390
Cadmium	3.2	1.2
Copper	627	140
Lead	4230	120
Selenium	25.5	2.4
Thallium	1.2	1.0
Zinc	1580	340

Remaining Metals (including As, Se, Sb) comply with MECP Table 3 standards

BS-D3-1 3.1-3.2 m 16-MAY-2022
Metals (including As, Se, Sb) comply with MECP Table 3 standards
Mercury complies with MECP Table 3 standards
Hexavalent Chromium complies with MECP Table 3 standards



LEGEND:

BS-D3-1 ANALYZED SOIL GRAB SAMPLE

APPROXIMATE EXTENT OF SOIL IMPACTED WITH CONCENTRATIONS OF METALS EXCEEDING THE MECP TABLE 3 STANDARDS

SOIL RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (METALS)

Scale: AS SHOWN	Date: 09/2022
Drawn by: RCG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-5B
Approved by: MB	Revision No.:

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DAGMAR AVENUE

RESIDENTIAL

MONTFORT STREET

RESIDENTIAL

ETHEL STREET

RESIDENTIAL

BARIBEAU STREET

LAMBERT STREET

CARILLON STREET

AMBROISE ST.

RESIDENTIAL

EXISTING PARK LAND

RESIDENTIAL

RESIDENTIAL DWELING

RESIDENTIAL

SHED

GRASSED

GRASSED

FORMER AHLUL-BAYT CENTRE

FORMER ABOVEGROUND STORAGE TANK

FORMER STORAGE

ASPHALTIC CONCRETE

#200 BARIBEAU STREET

A

A'

B

B'

TP5-G2 1.2-1.4 m 18-DEC-2020

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.94	0.15
Anthracene	2.52	0.67
Benzo[a]anthracene	5.68	0.5
Benzo[a]pyrene	5.40	0.3
Benzo[b]fluoranthene	6.35	0.78
Benzo[k]fluoranthene	3.50	0.78
Dibenzo[a,h]anthracene	0.94	0.1
Fluoranthene	13.0	0.69
Indeno[1,2,3-cd]pyrene	3.15	0.38
Phenanthrene	6.46	6.2

Remaining PAHs comply with MECP Table 3 standards

TP4-G2 1.5-1.7 m 18-DEC-2020

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	1.36	0.15
Anthracene	3.11	0.67
Benzo[a]anthracene	5.92	0.5
Benzo[a]pyrene	5.29	0.3
Benzo[b]fluoranthene	5.71	0.78
Benzo[k]fluoranthene	3.18	0.78
Dibenzo[a,h]anthracene	0.90	0.1
Fluoranthene	13.9	0.69
Indeno[1,2,3-cd]pyrene	2.87	0.38
Phenanthrene	9.48	6.2

Remaining PAHs comply with MECP Table 3 standards

TP6-21-01 1.3-2.4 m 2-DEC-2021

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.21	0.15
Benzo[a]anthracene	0.81	0.5
Benzo[a]pyrene	0.73	0.3
Dibenzo[a,h]anthracene	0.12	0.1
Fluoranthene	1.01	0.69

Remaining PAHs comply with MECP Table 3 standards

BS-A9-1 2.5-2.6 m 18-MAY-2022
PAHs comply with MECP Table 3 standards

TP1-G2 1.4-1.8 m 18-DEC-2020

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.36	0.15
Anthracene	0.99	0.67
Benzo[a]anthracene	3.04	0.5
Benzo[a]pyrene	3.08	0.3
Benzo[b]fluoranthene	3.16	0.78
Benzo[k]fluoranthene	1.78	0.78
Dibenzo[a,h]anthracene	0.47	0.1
Fluoranthene	6.57	0.69
Indeno[1,2,3-cd]pyrene	1.52	0.38

Remaining PAHs comply with MECP Table 3 standards

TP10-21-02 2.2-2.6 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

TP9-21-02 2.4-2.6 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-B3-1 2.5-2.6 m 28-FEB-2022
PAHs comply with MECP Table 3 standards

TP3-G2 0.7-1.0 m 18-DEC-2020

Parameter	Result (µg/g)	Standard (µg/g)
Benzo[a]anthracene	1.67	0.5
Benzo[a]pyrene	1.45	0.3
Benzo[b]fluoranthene	1.59	0.78
Benzo[k]fluoranthene	0.87	0.78
Dibenzo[a,h]anthracene	0.24	0.1
Fluoranthene	3.64	0.69
Indeno[1,2,3-cd]pyrene	0.74	0.38

Remaining PAHs comply with MECP Table 3 standards

TP2-G2 0.4-0.7 m 18-DEC-2020
PAHs comply with MECP Table 3 standards

TP5-21-02 2.2-2.5 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-C10-3 2.5-2.6 m 31-MAY-2022
PAHs comply with MECP Table 3 standards

TP15-21-02 2.4-2.8 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

TP6-G1 0.6-0.9 m 18-DEC-2020

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.35	0.15
Anthracene	0.86	0.67
Benzo[a]anthracene	1.99	0.5
Benzo[a]pyrene	1.84	0.3
Benzo[b]fluoranthene	2.12	0.78
Benzo[k]fluoranthene	1.20	0.78
Dibenzo[a,h]anthracene	0.33	0.1
Fluoranthene	4.24	0.69
Indeno[1,2,3-cd]pyrene	1.10	0.38

Remaining PAHs comply with MECP Table 3 standards

BS-C6-1 3.1-3.2 m 9-MAR-2022
PAHs comply with MECP Table 3 standards

TP11-21-02 2.6-3.0 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-D3-1 3.1-3.2 m 16-MAY-2022
PAHs comply with MECP Table 3 standards

TP8-21-02 1.5-2.0 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BH4-SS3 1.52-2.26 m 22-APR-2019
PAHs comply with MECP Table 3 standards

BH16-SS2 0.61-1.22 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.21	0.15
Benzo[a]anthracene	0.98	0.5
Benzo[a]pyrene	0.81	0.78
Benzo[b]fluoranthene	1.36	0.78
Dibenzo[a,h]anthracene	0.16	0.1
Fluoranthene	1.62	0.69
Indeno[1,2,3-cd]pyrene	0.66	0.38

Remaining PAHs comply with MECP Table 3 standards

BH14-SS2 0.61-1.22 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	6.86	0.15
Anthracene	5.69	0.67
Benzo[a]anthracene	13.0	0.5
Benzo[a]pyrene	12.6	0.78
Benzo[b]fluoranthene	15.3	0.78
Benzo[k]fluoranthene	7.88	0.78
Chrysene	11.0	7.0
Dibenzo[a,h]anthracene	2.08	0.1
Fluoranthene	20.0	0.69
Indeno[1,2,3-cd]pyrene	6.41	0.38
Phenanthrene	8.63	6.2

Remaining PAHs comply with MECP Table 3 standards

BS-E6-1 1.8-1.9 m 31-MAY-2022
PAHs comply with MECP Table 3 standards

TP8-G2 1.0-1.3m 18-DEC-2020
PAHs comply with MECP Table 3 standards

TP4-21-02 2.0-2.4 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

TP7-G3 1.9-2.2 m 18-DEC-2020
PAHs comply with MECP Table 3 standards

BS-E1-1 3.1-3.2m 18-MAY-2022
PAHs comply with MECP Table 3 standards

TP14-21-02 2.5-2.9 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BH13-SS3 1.22-1.83 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.16	0.15
Anthracene	1.73	0.67
Benzo[a]anthracene	3.38	0.5
Benzo[a]pyrene	2.34	0.3
Benzo[b]fluoranthene	3.45	0.78
Benzo[k]fluoranthene	1.68	0.78
Dibenzo[a,h]anthracene	0.41	0.1
Fluoranthene	6.56	0.69
Indeno[1,2,3-cd]pyrene	1.27	0.38

Remaining PAHs comply with MECP Table 3 standards

BH15-SS2 0.61-1.22 m 19-JUN-2019
PAHs comply with MECP Table 3 standards

BS-F4-1 2.5-2.6 m 31-MAY-2022
PAHs comply with MECP Table 3 standards

BH12-SS2 1.22-1.42 m 19-JUN-2019
PAHs comply with MECP Table 3 standards

BS-F2-1 2.5-2.6 m 18-MAY-2022
PAHs comply with MECP Table 3 standards

TP3-21-02 2.1-2.4 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BH17-SS2 0.61-1.22 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	2.4	0.15
Anthracene	12.2	0.67
Benzo[a]anthracene	30.8	0.5
Benzo[a]pyrene	24.2	0.3
Benzo[b]fluoranthene	33.4	0.78
Benzo[g,h,i]perylene	13.6	6.6
Benzo[k]fluoranthene	14.9	0.78
Chrysene	35.2	7.0
Dibenzo[a,h]anthracene	3.77	0.1
Fluoranthene	72.9	0.69
Indeno[1,2,3-cd]pyrene	12.9	0.38
Methylnaphthalene (1&2)	1.87	0.99
Naphthalene	1.70	0.6
Phenanthrene	50.90	6.2

Remaining PAHs comply with MECP Table 3 standards

BH6-SS3 1.22-1.83 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.25	0.15
Benzo[a]anthracene	1.16	0.5
Benzo[a]pyrene	0.95	0.3
Benzo[b]fluoranthene	1.35	0.78
Benzo[k]fluoranthene	0.86	0.78
Dibenzo[a,h]anthracene	0.16	0.1
Fluoranthene	2.06	0.69
Indeno[1,2,3-cd]pyrene	0.58	0.38

Remaining PAHs comply with MECP Table 3 standards

BS-G1-1 2.5-2.6 m 18-MAY-2022
PAHs comply with MECP Table 3 standards

TP13-21-02 2.5-2.8 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-G2-1 2.5-2.6 m 31-MAY-2022
PAHs comply with MECP Table 3 standards

BH7-SS3 1.22-1.83m 19-JUN-2019
PAHs comply with MECP Table 3 standards

TP2-21-02 2.2-2.4 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BH10-SS2 0.61-1.22 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.17	0.15
Benzo[a]anthracene	0.83	0.5
Benzo[a]pyrene	0.68	0.3
Benzo[b]fluoranthene	0.92	0.78
Dibenzo[a,h]anthracene	0.11	0.1
Fluoranthene	1.57	0.69

Remaining PAHs comply with MECP Table 3 standards

BS-G4-1 2.3-2.4 m 15-MAR-2022
PAHs comply with MECP Table 3 standards

BH2-SS2 0.76-1.37 m 22-APR-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.36	0.15
Anthracene	1.22	0.67
Benzo[a]anthracene	2.56	0.5
Benzo[a]pyrene	1.96	0.3
Benzo[b]fluoranthene	2.67	0.78
Benzo[k]fluoranthene	1.53	0.78
Dibenzo[a,h]anthracene	0.30	0.1
Fluoranthene	4.97	0.69
Indeno[1,2,3-cd]pyrene	1.02	0.38

Remaining PAHs comply with MECP Table 3 standards

TP1-21-02 2.3-2.4 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BH9-SS2 0.61-1.22 m 19-JUN-2019

Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.47	0.15
Benzo[a]anthracene	1.46	0.5
Benzo[a]pyrene	1.56	0.3
Benzo[b]fluoranthene	1.72	0.78
Benzo[k]fluoranthene	1.01	0.78
Dibenzo[a,h]anthracene	0.25	0.1
Fluoranthene	1.64	0.69
Indeno[1,2,3-cd]pyrene	0.79	0.38

Remaining PAHs comply with MECP Table 3 standards

BS-G10-2 1.8-1.9 m 23-MAR-2022
PAHs comply with MECP Table 3 standards

BS-G10-1 1.6-1.7 m 9-MAR-2022

Parameter	Result (µg/g)	Standard (µg/g)
Benzo[a]anthracene	0.72	0.5
Benzo[a]pyrene	0.63	0.3
Fluoranthene	1.64	0.69

Remaining PAHs comply with MECP Table 3 standards

TP 5 56.14
TP 15-21 56.04
TP 6 56.14
TP 13-21 55.
BH 1-23 55.92 (53.87)
TP 7 55.93
TP 14-21 55.91
BH 5 55.95
BH 2-23 55.90 (53.39)
TP 10-21 56.02
TP 4 55.99
BH 13 55.95
TP 12-21 55.95
BH 6 55.80
TP 3 55.27
BH 1 55.90 (54.35)
TP 11-21 55.87
TP 8-21 55.03
BH 16 55.95
BH 14 55.95
BH 7 55.85
TP 1-21 55.85
BH 2 55.90 (54.45)
BH 11 55.93
BH 10 55.90
TP 9-21 55.91
BH 4-23 55.75 (53.85)
TP 6-21 55.95
TP 1 55.98
TP 2 54.73
TP 7-21 54.83
TP 5-21 55.95
BH 3 55.95 (55.13)
BH 4 55.75
BH 15 55.64
BH 12 55.95
BH 8 55.85
TP 3-21 55.61
BH 9 55.55
TP 2-21 55.47
TP 8 56.06
TP 4-21 55.74
BH 3-23 55.38 (52.58)
BH 17 55.60

BS-B3-1, BS-A9-1, BS-C6-1, BS-C10-3, BS-D3-1, BS-E1-1, BS-E6-1, BS-F2-1, BS-F4-1, BS-G1-1, BS-G2-1, BS-G4-1, BS-G4-1 & BS-T4-1, BS-G10-1 & BS-G10-2

LEGEND:

- TEST PIT LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (PATERSON GROUP, 2019)
- BOREHOLE LOCATION (PATERSON GROUP, 2019)
- ANALYZED SOIL GRAB SAMPLE
- 98.70 GROUND SURFACE ELEVATION (m)
- (97.15) GROUNDWATER SURFACE ELEVATION (m)
- A — A' CROSS-SECTION LOCATION
- RSC PROPERTY
- APPROXIMATE EXTENT OF SOIL IMPACTED WITH CONCENTRATIONS OF PAHs EXCEEDING THE MECP TABLE 3 STANDARDS

GROUND SURFACE ELEVATIONS AT BOREHOLE AND TEST PIT LOCATIONS ARE REFERENCED TO A GEODETIC DATUM

SOIL SAMPLE RESULT IN COMPLIANCE WITH MECP TABLE 3 STANDARDS

SOIL SAMPLE RESULT EXCEEDS MECP TABLE 3 STANDARDS

0 1 2 3 4 5 10 15 20m

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NO.	REVISIONS	DATE	INITIAL
0			

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

Title:

ANALYTICAL TESTING PLAN - SOIL (PAHs)

Stamp:

Scale:	1:300
Drawn by:	RCG
Checked by:	MB
Approved by:	MB
Date:	07/2022

Report No.: PE4597-2
Drawing No.: PE4597-6
Revision No.: 1

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TP6-G1	0.6-0.9 m	18-DEC-2020
Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.35	0.15
Anthracene	0.86	0.67
Benzo[a]anthracene	1.99	0.5
Benzo[a]pyrene	1.84	0.3
Benzo[b]fluoranthene	2.12	0.78
Benzo[k]fluoranthene	1.20	0.78
Dibenzo[a,h]anthracene	0.33	0.1
Fluoranthene	4.24	0.69
Indeno[1,2,3-cd]pyrene	1.10	0.38

Remaining PAHs comply with MECP Table 3 standards

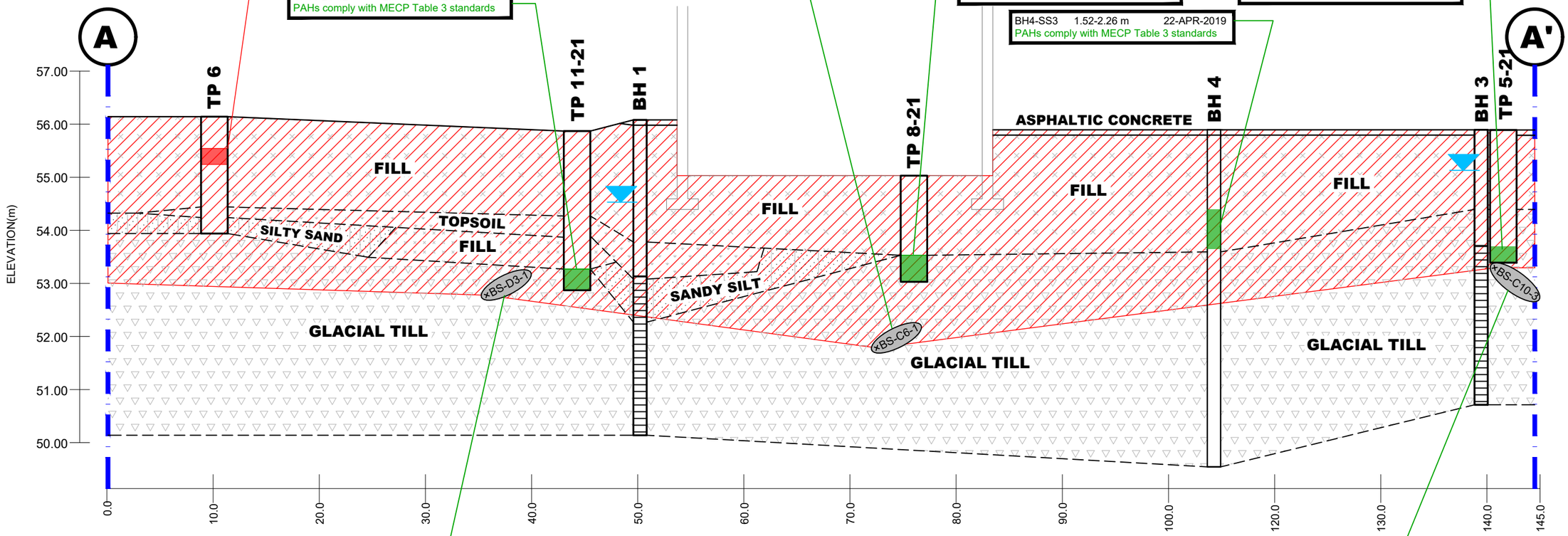
TP11-21-02 2.6-3.0 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-C6-1 3.1-3.2 m 9-MAR-2022
PAHs comply with MECP Table 3 standards

TP8-21-02 1.5-2.0 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BH4-SS3 1.52-2.26 m 22-APR-2019
PAHs comply with MECP Table 3 standards

TP5-21-02 2.2-2.5 m 2-DEC-2021
PAHs comply with MECP Table 3 standards



BS-D3-1 3.1-3.2 m 16-MAY-2022
PAHs comply with MECP Table 3 standards

BS-C10-3 2.5-2.6 m 31-MAY-2022
PAHs comply with MECP Table 3 standards

LEGEND:

BS-D3-1 ANALYZED SOIL GRAB SAMPLE

APPROXIMATE EXTENT OF SOIL IMPACTED WITH CONCENTRATIONS OF METALS EXCEEDING THE MECP TABLE 3 STANDARDS

SOIL RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET
OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (PAHs)

Scale: AS SHOWN	Date: 09/2022
Drawn by: RCG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-6A
Approved by: MB	Revision No.:

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TP3-G2	0.7-1.0 m	18-DEC-2020
Parameter	Result (µg/g)	Standard (µg/g)
Benzo[a]anthracene	1.67	0.5
Benzo[a]pyrene	1.45	0.3
Benzo[b]fluoranthene	1.59	0.78
Benzo[k]fluoranthene	0.87	0.78
Dibenzo[a,h]anthracene	0.24	0.1
Fluoranthene	3.64	0.69
Indeno[1,2,3-cd]pyrene	0.74	0.38

Remaining PAHs comply with MECP Table 3 standards

TP4-G2	1.5-1.7 m	18-DEC-2020
Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	1.36	0.15
Anthracene	3.11	0.67
Benzo[a]anthracene	5.92	0.5
Benzo[a]pyrene	5.29	0.3
Benzo[b]fluoranthene	5.71	0.78
Benzo[k]fluoranthene	3.18	0.78
Dibenzo[a,h]anthracene	0.90	0.1
Fluoranthene	13.9	0.69
Indeno[1,2,3-cd]pyrene	2.87	0.38
Phenanthrene	9.48	6.2

Remaining PAHs comply with MECP Table 3 standards

TP10-21-02 2.2-2.6 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-B3-1 2.5-2.6 m 28-FEB-2022
PAHs comply with MECP Table 3 standards

TP11-21-02 2.6-3.0 m 2-DEC-2021
PAHs comply with MECP Table 3 standards

BS-F2-1 2.5-2.6 m 18-MAY-2022
PAHs comply with MECP Table 3 standards

BH7-SS3 1.22-1.83m 19-JUN-2019
PAHs comply with MECP Table 3 standards

BS-G4-1 2.3-2.4 m 15-MAR-2022
PAHs comply with MECP Table 3 standards

BH10-SS2	0.61-1.22 m	19-JUN-2019
Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.17	0.15
Benzo[a]anthracene	0.83	0.5
Benzo[a]pyrene	0.68	0.3
Benzo[b]fluoranthene	0.92	0.78
Dibenzo[a,h]anthracene	0.11	0.1
Fluoranthene	1.57	0.69

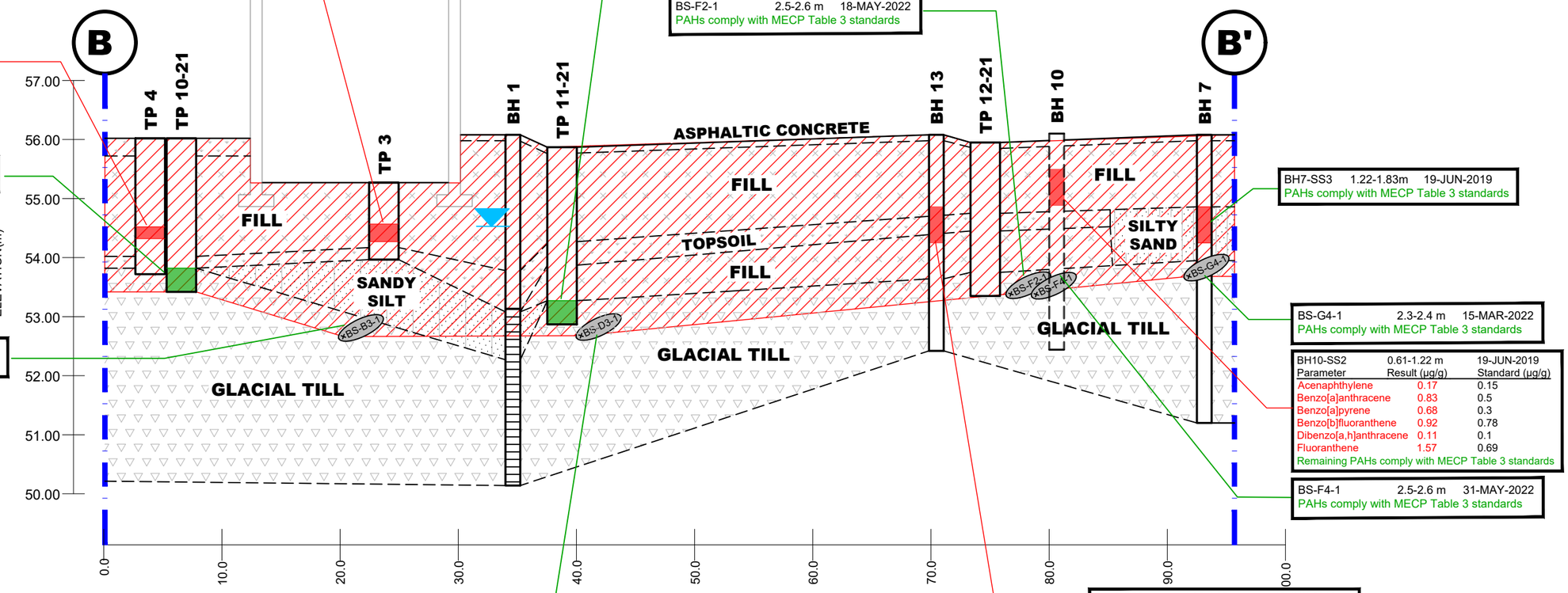
Remaining PAHs comply with MECP Table 3 standards

BS-F4-1 2.5-2.6 m 31-MAY-2022
PAHs comply with MECP Table 3 standards

BH13-SS3	1.22-1.83 m	19-JUN-2019
Parameter	Result (µg/g)	Standard (µg/g)
Acenaphthylene	0.16	0.15
Anthracene	1.73	0.67
Benzo[a]anthracene	3.38	0.5
Benzo[a]pyrene	2.34	0.3
Benzo[b]fluoranthene	3.45	0.78
Benzo[k]fluoranthene	1.68	0.78
Dibenzo[a,h]anthracene	0.41	0.1
Fluoranthene	6.56	0.69
Indeno[1,2,3-cd]pyrene	1.27	0.38

Remaining PAHs comply with MECP Table 3 standards

BS-D3-1 3.1-3.2 m 16-MAY-2022
PAHs comply with MECP Table 3 standards



LEGEND:

BS-D3-1 ANALYZED SOIL GRAB SAMPLE

APPROXIMATE EXTENT OF SOIL IMPACTED WITH CONCENTRATIONS OF PAHs EXCEEDING THE MECP TABLE 3 STANDARDS

SOIL RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

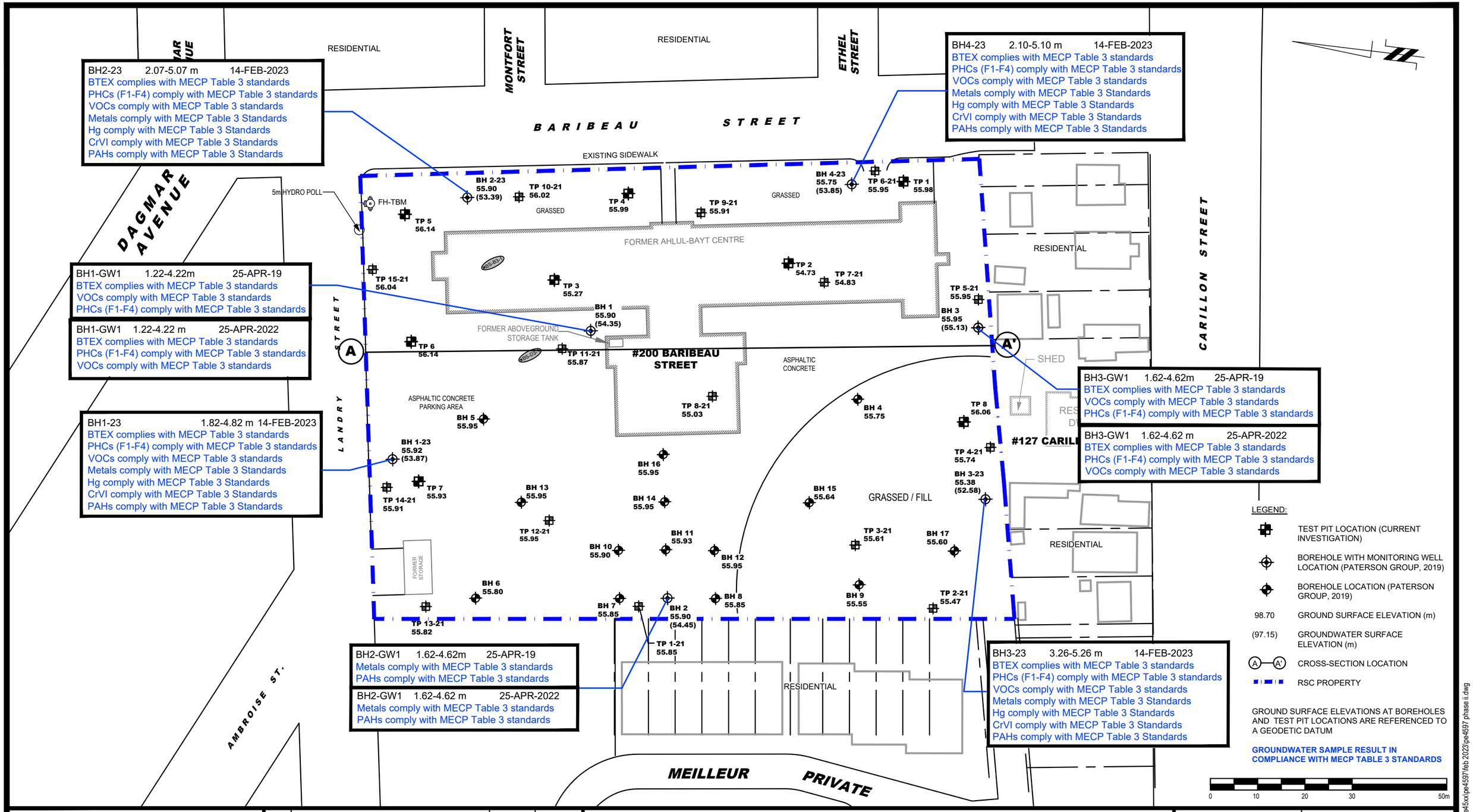
OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (PAHs)

Scale: AS SHOWN	**Date:** 09/2022
Drawn by: RCG	**Report No.:** PE4597-2R
Checked by: MB	**Dwg. No.:** PE4597-6B
Approved by: MB	**Revision No.:**

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NO.	REVISIONS	DATE	INITIAL
1	UPDATED SITE BOUNDARY NEW 2020 TEST PITS ADDED	02/12/2021	MB

BARIBEAU STREET DEVELOPMENT LIMITED

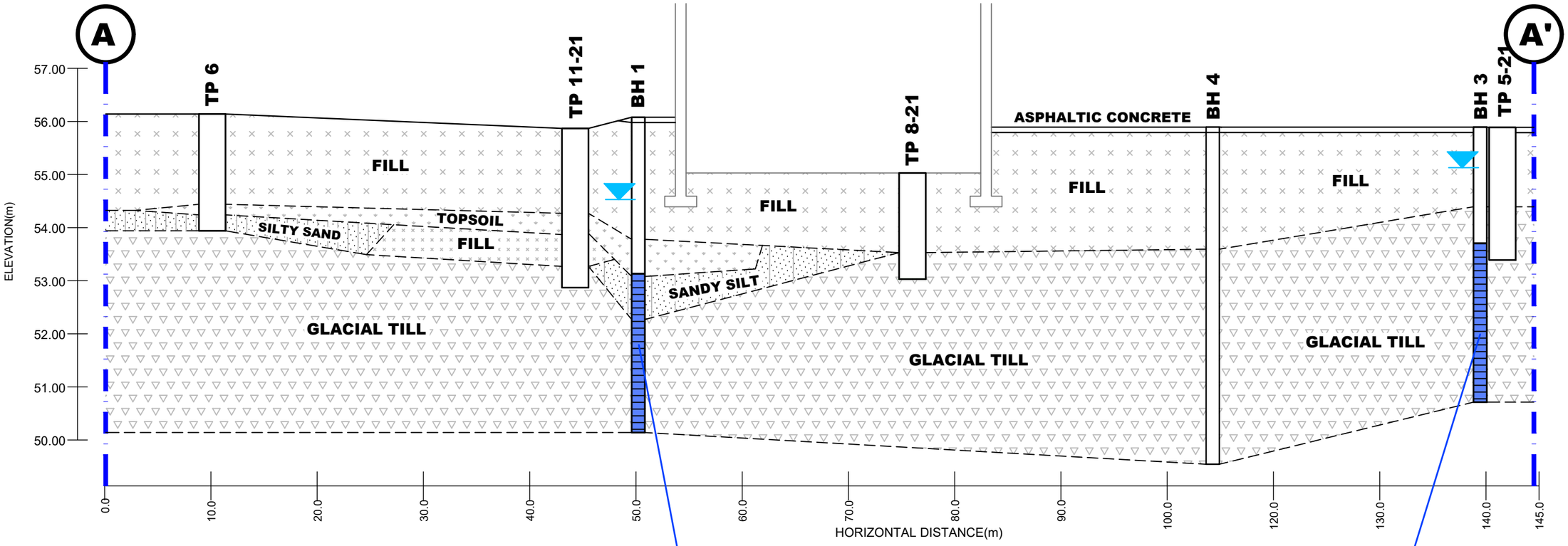
PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN - GROUNDWATER

Scale: 1:750	Date: 06/2019
Drawn by: MPG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-7
Approved by: MB	Revision No.: 1

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BH1-GW1 1.22-4.22m 25-APR-19
BTEX complies with MECP Table 3 standards
VOCs comply with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BH1-GW1 1.22-4.22 m 25-APR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards
VOCs comply with MECP Table 3 standards

BH3-GW1 1.62-4.62m 25-APR-19
BTEX complies with MECP Table 3 standards
VOCs comply with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards

BH3-GW1 1.62-4.62 m 25-APR-2022
BTEX complies with MECP Table 3 standards
PHCs (F1-F4) comply with MECP Table 3 standards
VOCs comply with MECP Table 3 standards

*

GROUNDWATER RESULT COMPLIES WITH MECP TABLE 3 STANDARDS

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BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

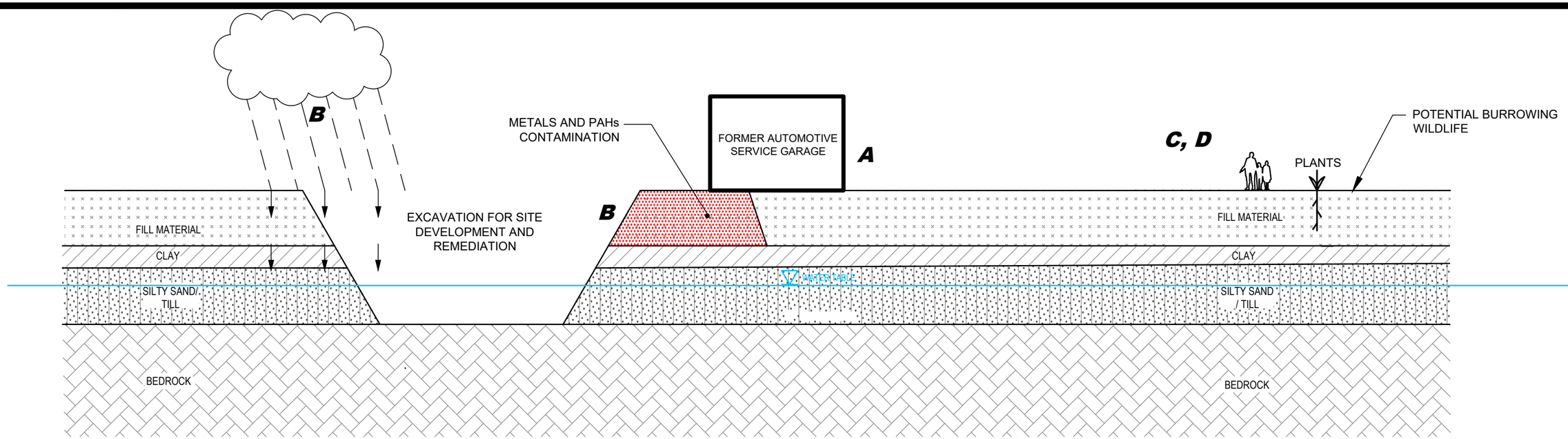
OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER

Scale: AS SHOWN	Date: 09/2022
Drawn by: RCG	Report No.: PE4597-2R
Checked by: MB	Dwg. No.: PE4597-7A
Approved by: MB	Revision No.:

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A CONTAMINANT TRANSPORT PATHWAYS

1. Physical transport – one potential contaminant transport pathway is the physical transport from one location to another of impacted soil, either intentionally or unintentionally, by earth moving equipment, vehicle traffic, or pedestrian traffic. The potential for physical transport of contaminants to have occurred on the RSC Property is considered to be low.
2. Precipitation/Infiltration/Leaching – As precipitation falls on the ground surface and subsequently infiltrates through the soil to the groundwater table, there is the potential for contaminants in the soil phase to enter the groundwater, depending on the solubility of the contaminants

As the RSC Property was mostly paved or occupied by buildings, with the exception of small landscaped areas, the potential for infiltration and leaching due to precipitation is very low. Given that the groundwater beneath the RSC Property complies with the MECP Table 3 standards no significant contaminant transport is considered to have occurred at the RSC Property.

B HUMAN AND ECOLOGICAL RECEPTORS

1. Human Receptors - Potential human receptors are considered to be limited to construction workers and environmental professionals who may contact the soil during the remediation and/or rehabilitation of the site. The site is located in a municipally serviced area.
2. Ecological Receptors – There are no significant potential ecological receptors are present on the RSC Property as the property is mostly covered by paved areas. No significant potential ecological receptors are present downgradient of the RSC Property given the urban setting of the RSC Property.

C RECEPTOR EXPOSURE POINTS

1. Human Receptors – Exposure points for human receptors consist of remedial excavations.
2. Ecological Receptors – In general, the most likely exposure points for ecological receptors include the root zones of plants and the burrows of burrowing wildlife. As noted above there was limited potential for contact with ecological receptors on the RSC Property.

D ROUTES OF EXPOSURES

1. Human Receptors – Routes of exposure for human receptors (construction works and environmental professionals) include dermal contact, accidental ingestion and inhalation.
2. Ecological Receptors – Routes of exposure for ecological receptors include ingestion, dermal contact and inhalation. There are no potential ecological receptors as discussed above due to the site being covered with paved areas as well as being situated in an urban setting. Furthermore, groundwater at the RSC Property complies with the site standards.

PATERSON GROUP
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NO.	REVISIONS	DATE	INITIAL

BARIBEAU STREET DEVELOPMENT LIMITED

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
200 BARIBEAU STREET

OTTAWA, ONTARIO

Title:

CONTAMINANT TRANSPORT DIAGRAM

Scale: N.T.S.	Date: 02/2023
Drawn by: RCG	Report No.: PE4597
Checked by: MB	Dwg. No.: PE4597-8
Approved by: MB	Revision No.: 0

p:\autocad drawings\environmental\pe45xx\pe4597\feb 2023\pe4597-8 contaminant transport.dwg

PATERSON GROUP

Soil Remediation

200 Baribeau Street

Ottawa, Ontario

Prepared for Baribeau Street Development Inc.

Report PE4597-LET.15-APPENDIX 1 dated February 28, 2023

1.0 Introduction

Between February and August 2022, Paterson Group (Paterson) commenced monitoring an environmental site remedial program for the property addressed 200 Baribeau Street, in the City of Ottawa, Ontario. The findings of the monitoring program are detailed in this report.

Background

A Phase I ESA was completed by Paterson Group) for the RSC Property which identified multiple PCAs representing APECs on the RSC property. The APECs consisted of an on-site furnace oil tank (AST) in the basement of the school building, fill material of unknown quality throughout the RSC Property, and an adjacent private automotive service garage.

As part of the historical research a report prepared for the Ministry of Environment Ottawa District Office titled “Review of Historical Land Use in the Landry St./Baribeau St. Area, City of Vanier was reviewed. The contents of the report identified the RSC property as part of the former Dominion City Bridge Company property, with a likelihood of metals impacts to be present on the site. Fill placement, including the potential for pockets of refuse were listed as probable for the former L’Ecole Baribeau property (the RSC property), although it is also suggested that the importation of clean fill occurred as part of the school construction.

A Phase II ESA was carried out for the RSC Property in April 2019 to address these environmental concerns. Supplemental Phase II investigations were also completed in June 2019, December 2020, and December 2021 to delineate areas of impacted soil. The Phase II ESA and supplemental investigations identified impacted soil (fill material) throughout the RSC property. Groundwater testing during the Phase II ESA did not identify any impacted water on the RSC property.

A soil remediation was undertaken on the RSC property as part of the redevelopment of the site for residential purposes.

2.0 Soil Remedial Program

Between February and August 2022, Paterson monitored the excavation of impacted fill material throughout the RSC property. The contaminated fill was excavated with hydraulic excavators and hauled to Waste Connections Canada, an approved waste disposal facility on Navan Road, in Ottawa, Ontario. Soil in the vicinity of the remedial excavation generally consisted of fill underlain by native silty clay. Bedrock was not encountered.

A total of approximately 57,958 mt of contaminated fill and soil was sent to the approved waste disposal facility.

No impacted groundwater was identified as part of the soil remediation program, nor was any impacted groundwater identified as part of the Phase II ESA investigations.

3.0 Free Product

No free product was identified in the groundwater entering the excavation, nor during the Phase II ESA investigations. The long term groundwater level in the area of the excavation is considered to be within the native soil and was not encountered during the remediation program.

4.0 Confirmatory Sampling and Analysis

Confirmatory Soil Sampling Program

The soil sampling protocols followed during this remedial program were in general accordance with the MECP document entitled *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario"*, dated May 1996.

All soil samples were subjected to a preliminary screening procedure, which included visual screening as well as screening with a MiniRae photoionization detector (PID) or an RKI Eagle combustible vapour detector. The detection limit of the PID is 0.1 ppm with a precision of +/- 0.1 ppm. The detection limit of the RKI is 5ppm with a precision of +/- 5ppm. The soil vapours were measured by inserting the analyzer probe into the nominal headspace above the soil sample. Samples were then agitated and the peak readings recorded. The vapour readings were considered to be negligible for all samples. It is noted that vapour screening is of limited use for the heavier hydrocarbon fractions.

Screened samples were selected for laboratory analysis based on visual screening, vapour readings as well as sample location in accordance with the prescribed sample density outlined in Ontario Regulation (O.Reg.) 153/04 as amended by O.Reg. 269/11 and represent the worst-case conditions. Confirmatory soil samples were taken from the walls base of the excavation.

The quantity of confirmatory samples is in compliance with the Minimum Confirmation Sampling Requirements for Excavation and are considered to be sufficient to confirm the quality of the soil remaining on the RSC property.

Analytical Testing

The remedial standards applicable for the subject site were Table 3 of the document entitled *"Soil, Groundwater and Sediment Standards for Use under Part XV.I of the Environmental Protection Act"* prepared by the Ontario Ministry of the Environment, Conservation and Parks (MECP), dated April 15, 2011. The Table 3 standards are based on the following considerations:

- Fine-grained soil conditions
- Non-potable groundwater conditions
- Residential land use
- Full depth conditions

Paracel Laboratories (Paracel) of Ottawa, Ontario, performed the laboratory analysis of the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Environmental Analytical Laboratories (SCC/CAEAL). Paracel is accredited and certified by SCC/CAEAL for specific tests registered with the association.

Soil results from the base of the excavation are presented within the Phase II ESA drawings. All analytical test results of the confirmatory base samples are in compliance with MECP Table 3 standards for residential land use.

Sidewall sampling did not occur as part of the investigation, as the excavation continued to the property boundaries along all 4 sides of the property. No sidewall sampling was required.

Quality Assurance/Quality Control

All samples submitted as part of the remediation testing were handled in accordance with the Analytical Protocol with respect to holding time, preservation method, storage requirement, and container type.

As per Subsection 47(3) of O.Reg. 153/04 as amended by O.Reg. 269/11, a Certificate of Analysis has been received for each sample submitted for analysis during the sampling events, and all Certificates of Analysis are appended to this report.

Overall, the quality of the field data collected during the remediation program is considered to be sufficient to meet the overall objectives of this assessment.

5.0 Assessment and Conclusions

Assessment

Paterson Group monitored the remedial excavation of contaminated fill material at 200 Baribeau Street, in Ottawa, Ontario. The contaminated fill had been previously identified by a Phase II-ESA conducted at the RSC property. Paterson monitored the segregation of contaminated and non-contaminated soil using visual screening methods, vapour measurements and analytical testing.

Contaminated fill was excavated and transferred to an approved waste disposal facility operated by Waste Connections Canada on Navan Road, in the City of Ottawa, Ontario. A total of approximately 57,958mt of contaminated fill was disposed at the approved waste disposal facility.

Confirmatory sample results from the base of the excavation (where native silty clay was encountered) indicated that all soil remaining at the subject site was in compliance with the MECP Table 3 standards for residential land use. All sidewalls were excavated to the property boundary. No additional soil sampling is considered to be required.

Conclusion

Based on our field observations combined with the analytical test results, all contaminated fill was removed from the RSC Property. The remaining soil on the RSC Property is in compliance with the applicable MECP Table 3 standards for residential land use. No further soil remedial program is required or recommended at this time.

6.0 Statement of Limitations

The results of the sampling program are based on our field observations, visual survey results, and analytical test results obtained at specific test locations which can only be extrapolated to an undefined limited area around each location. The test results may not reflect conditions at other locations or areas beyond the extent of the excavation.

This report was prepared for the sole use of Baribeau Street Development Inc. Permission from Baribeau Street Development Inc., and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.



Michael Beaudoin, P.Eng. QP_{ESA}

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 32110
Project: PE4597
Custody: 132319

Report Date: 17-Mar-2022
Order Date: 11-Mar-2022

Order #: 2211608

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

Paracel ID	Client ID
2211608-01	BS-B3-1
2211608-02	BS-C6-1
2211608-03	BS-G10-1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 17-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 11-Mar-2022

Client PO: 32110

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	11-Mar-22	14-Mar-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	14-Mar-22	16-Mar-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	15-Mar-22	15-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	11-Mar-22	14-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	14-Mar-22	16-Mar-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	15-Mar-22	15-Mar-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	14-Mar-22	17-Mar-22
Solids, %	Gravimetric, calculation	15-Mar-22	15-Mar-22

Certificate of Analysis

Report Date: 17-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 11-Mar-2022

Client PO: 32110

Project Description: PE4597

	Client ID:	BS-B3-1	BS-C6-1	BS-G10-1	-
	Sample Date:	28-Feb-22 09:00	09-Mar-22 09:00	09-Mar-22 09:00	-
	Sample ID:	2211608-01	2211608-02	2211608-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	82.7	82.3	89.2	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	1.1	-
Arsenic	1.0 ug/g dry	1.8	1.9	11.1	-
Barium	1.0 ug/g dry	40.2	50.1	68.2	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	0.5	-
Boron	5.0 ug/g dry	<5.0	5.3	7.9	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	16.2	26.0	28.3	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	-
Cobalt	1.0 ug/g dry	4.8	6.2	9.8	-
Copper	5.0 ug/g dry	8.1	12.4	30.4	-
Lead	1.0 ug/g dry	2.5	3.1	35.5	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	1.1	<1.0	4.9	-
Nickel	5.0 ug/g dry	11.3	15.2	32.7	-
Selenium	1.0 ug/g dry	<1.0	<1.0	2.4	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	1.6	-
Vanadium	10.0 ug/g dry	20.3	29.1	50.2	-
Zinc	20.0 ug/g dry	24.0	34.5	62.1	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene-d8	Surrogate	119%	118%	114%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	24	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	27	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	-

Certificate of Analysis

Report Date: 17-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 11-Mar-2022

Client PO: 32110

Project Description: PE4597

	Client ID:	BS-B3-1	BS-C6-1	BS-G10-1	-
	Sample Date:	28-Feb-22 09:00	09-Mar-22 09:00	09-Mar-22 09:00	-
	Sample ID:	2211608-01	2211608-02	2211608-03	-
	MDL/Units	Soil	Soil	Soil	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	0.15	-
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	0.03	-
Anthracene	0.02 ug/g dry	<0.02	<0.02	0.41	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	0.72	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	0.63	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	0.61	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	0.26	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	0.34	-
Chrysene	0.02 ug/g dry	<0.02	<0.02	0.72	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	0.08	-
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	1.64	-
Fluorene	0.02 ug/g dry	<0.02	<0.02	0.18	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	0.24	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	-
Naphthalene	0.01 ug/g dry	<0.01	<0.01	0.02	-
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	1.51	-
Pyrene	0.02 ug/g dry	<0.02	<0.02	1.27	-
2-Fluorobiphenyl	Surrogate	74.3%	72.1%	81.5%	-
Terphenyl-d14	Surrogate	100%	89.7%	100%	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.14*		*ug/g*		*85.4*	*50-140*			
Surrogate: Terphenyl-d14	*1.35*		*ug/g*		*101*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.54*		*ug/g*		*107*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	28	7	ug/g	30			6.4	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	36	8	ug/g	36			0.2	30	
F4 PHCs (C34-C50)	16	6	ug/g	14			17.5	30	
Metals									
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Mercury	3.15	0.1	ug/g	2.98			5.4	30	
Physical Characteristics									
% Solids	97.3	0.1	% by Wt.	98.7			1.4	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	0.025			NC	40	
Acenaphthylene	0.059	0.02	ug/g	0.080			29.7	40	
Anthracene	0.094	0.02	ug/g	0.116			20.3	40	
Benzo [a] anthracene	0.100	0.02	ug/g	0.106			5.6	40	
Benzo [a] pyrene	0.170	0.02	ug/g	0.212			21.7	40	
Benzo [b] fluoranthene	0.208	0.02	ug/g	0.216			3.9	40	
Benzo [g,h,i] perylene	0.176	0.02	ug/g	0.234			27.9	40	
Benzo [k] fluoranthene	0.090	0.02	ug/g	0.096			6.0	40	
Chrysene	0.165	0.02	ug/g	0.175			6.1	40	
Dibenzo [a,h] anthracene	0.036	0.02	ug/g	0.049			28.7	40	
Fluoranthene	0.163	0.02	ug/g	0.190			15.1	40	
Fluorene	0.021	0.02	ug/g	0.026			22.1	40	
Indeno [1,2,3-cd] pyrene	0.137	0.02	ug/g	0.187			30.6	40	
1-Methylnaphthalene	0.039	0.02	ug/g	0.049			21.5	40	
2-Methylnaphthalene	0.065	0.02	ug/g	0.086			27.3	40	
Naphthalene	0.067	0.01	ug/g	0.090			29.2	40	
Phenanthrene	0.194	0.02	ug/g	0.213			9.6	40	
Pyrene	0.129	0.02	ug/g	0.149			15.1	40	
Surrogate: 2-Fluorobiphenyl	*1.28*		*ug/g*		*79.2*	*50-140*			
Surrogate: Terphenyl-d14	*1.54*		*ug/g*		*95.1*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*12.0*		*ug/g*		*116*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	207	7	ug/g	ND	103	80-120			
F2 PHCs (C10-C16)	100	4	ug/g	ND	102	60-140			
F3 PHCs (C16-C34)	285	8	ug/g	36	104	60-140			
F4 PHCs (C34-C50)	198	6	ug/g	14	123	60-140			
Metals									
Antimony	41.9	1.0	ug/g	ND	83.7	70-130			
Arsenic	46.6	1.0	ug/g	ND	93.2	70-130			
Barium	46.8	1.0	ug/g	ND	93.5	70-130			
Beryllium	47.4	0.5	ug/g	ND	94.8	70-130			
Boron	45.1	5.0	ug/g	ND	90.3	70-130			
Cadmium	47.4	0.5	ug/g	ND	94.9	70-130			
Chromium (VI)	3.7	0.2	ug/g	ND	60.5	70-130			QM-05
Chromium	48.0	5.0	ug/g	ND	96.0	70-130			
Cobalt	47.7	1.0	ug/g	ND	95.4	70-130			
Copper	47.5	5.0	ug/g	ND	94.9	70-130			
Lead	44.5	1.0	ug/g	ND	89.0	70-130			
Mercury	4.61	0.1	ug/g	2.98	109	70-130			
Molybdenum	45.4	1.0	ug/g	ND	90.9	70-130			
Nickel	47.5	5.0	ug/g	ND	95.0	70-130			
Selenium	43.3	1.0	ug/g	ND	86.6	70-130			
Silver	48.2	0.3	ug/g	ND	96.4	70-130			
Thallium	45.7	1.0	ug/g	ND	91.3	70-130			
Uranium	47.7	1.0	ug/g	ND	95.4	70-130			
Vanadium	48.7	10.0	ug/g	ND	97.4	70-130			
Zinc	46.3	20.0	ug/g	ND	92.7	70-130			
Semi-Volatiles									
Acenaphthene	0.232	0.02	ug/g	0.025	103	50-140			
Acenaphthylene	0.233	0.02	ug/g	0.080	75.8	50-140			
Anthracene	0.278	0.02	ug/g	0.116	79.9	50-140			
Benzo [a] anthracene	0.288	0.02	ug/g	0.106	89.9	50-140			
Benzo [a] pyrene	0.415	0.02	ug/g	0.212	101	50-140			
Benzo [b] fluoranthene	0.492	0.02	ug/g	0.216	136	50-140			
Benzo [g,h,i] perylene	0.404	0.02	ug/g	0.234	84.4	50-140			
Benzo [k] fluoranthene	0.329	0.02	ug/g	0.096	115	50-140			
Chrysene	0.422	0.02	ug/g	0.175	122	50-140			
Dibenzo [a,h] anthracene	0.240	0.02	ug/g	0.049	94.5	50-140			
Fluoranthene	0.369	0.02	ug/g	0.190	88.4	50-140			
Fluorene	0.230	0.02	ug/g	0.026	101	50-140			
Indeno [1,2,3-cd] pyrene	0.340	0.02	ug/g	0.187	75.6	50-140			
1-Methylnaphthalene	0.277	0.02	ug/g	0.049	113	50-140			
2-Methylnaphthalene	0.325	0.02	ug/g	0.086	118	50-140			
Naphthalene	0.299	0.01	ug/g	0.090	104	50-140			
Phenanthrene	0.391	0.02	ug/g	0.213	87.8	50-140			
Pyrene	0.323	0.02	ug/g	0.149	85.9	50-140			
Surrogate: 2-Fluorobiphenyl	*1.55*		*ug/g*		*95.9*	*50-140*			
Surrogate: Terphenyl-d14	*1.83*		*ug/g*		*113*	*50-140*			
Volatiles									
Benzene	2.93	0.02	ug/g	ND	73.1	60-130			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 32110

Report Date: 17-Mar-2022

Order Date: 11-Mar-2022

Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	3.18	0.05	ug/g	ND	79.6	60-130			
Toluene	3.34	0.05	ug/g	ND	83.4	60-130			
m,p-Xylenes	6.27	0.05	ug/g	ND	78.4	60-130			
o-Xylene	3.12	0.05	ug/g	ND	78.0	60-130			
Surrogate: Toluene-d8	*8.18*		*ug/g*		*102*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARAC LABORATORIES

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2211608	№ 132319

Client Name: Paterson Group	Project Ref: PE4597	Page 1 of 1
Contact Name: Mike Beaudoin	Quote #:	
Address: 154 Colonnade Rd, S Ottawa	PO #: 32110	Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-226-7381	E-mail: mbeaudoin@patersongroup.ca jandrechek@ " " "	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☒ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table	Mun:
For RSC: ☒ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BS-B3-1	S		2	28-FEB-22	✓	X		X	X	X	X							
2	BS-C6-1	S		2	9-MAR-22	✓	X		X	X	X	X							
3	BS-G10-1	S		2	9-MAR-22	✓	X		X	X	X	X							
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: TRACEL COURIER

Relinquished By (Sign): Kat Linscott	Received By Driver/Depot: A. TESSIER	Received at Lab:	Verified By:
Relinquished By (Print): Kat Linscott	Date/Time: 11/03/22 1:11	Date/Time: Mar 11 2022 14:05	Date/Time: Mar 11 2022 14:51
Date/Time: March 11/2022	Temperature: °C FH	Temperature: 6.0 °C	pH Verified: ☐ By: NA

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 54708
Project: PE4597
Custody: 136615

Report Date: 30-May-2022
Order Date: 20-May-2022

Order #: 2221636

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

Paracel ID	Client ID
2221636-01	BS-G1-1
2221636-02	BS-F2-1
2221636-03	BS-E1-1
2221636-04	BS-D3-1
2221636-05	BS-A9-1
2221636-06	BS-19-1

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-May-2022

Client: Paterson Group Consulting Engineers

Order Date: 20-May-2022

Client PO: 54708

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	26-May-22	27-May-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	25-May-22	26-May-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	27-May-22	27-May-22
PHC F1	CWS Tier 1 - P&T GC-FID	26-May-22	27-May-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	24-May-22	27-May-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	26-May-22	26-May-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	24-May-22	28-May-22
Solids, %	Gravimetric, calculation	26-May-22	26-May-22

Certificate of Analysis

Report Date: 30-May-2022

Client: Paterson Group Consulting Engineers

Order Date: 20-May-2022

Client PO: 54708

Project Description: PE4597

	Client ID:	BS-G1-1	BS-F2-1	BS-E1-1	BS-D3-1
	Sample Date:	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00	16-May-22 09:00
	Sample ID:	2221636-01	2221636-02	2221636-03	2221636-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	83.1	82.5	87.8	80.5
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.1	2.2	3.3	5.8
Barium	1.0 ug/g dry	32.7	34.1	64.3	34.1
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	<5.0	<5.0	5.5	<5.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	18.9	20.9	35.0	18.3
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	4.8	4.8	8.5	4.1
Copper	5.0 ug/g dry	7.9	9.4	17.6	7.7
Lead	1.0 ug/g dry	2.3	2.1	5.0	1.9
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	11.2	11.6	22.8	9.5
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	1.1	<1.0
Vanadium	10.0 ug/g dry	24.9	26.4	65.5	27.9
Zinc	20.0 ug/g dry	25.4	22.2	40.3	<20.0
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	78.6%	79.6%	66.5%	79.3%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	10	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Certificate of Analysis

Report Date: 30-May-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 20-May-2022

Client PO: **54708**

Project Description: PE4597

	Client ID:	BS-G1-1	BS-F2-1	BS-E1-1	BS-D3-1
	Sample Date:	18-May-22 09:00	18-May-22 09:00	18-May-22 09:00	16-May-22 09:00
	Sample ID:	2221636-01	2221636-02	2221636-03	2221636-04
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	<0.02	<0.02	0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	71.7%	82.2%	102%	107%
Terphenyl-d14	Surrogate	80.4%	91.1%	115%	95.4%

Certificate of Analysis

Report Date: 30-May-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 20-May-2022

Client PO: **54708**

Project Description: PE4597

	Client ID:	BS-A9-1	BS-19-1	-	-
	Sample Date:	18-May-22 09:00	18-May-22 09:00	-	-
	Sample ID:	2221636-05	2221636-06	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	92.7	92.9	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	7.1	-	-	-
Barium	1.0 ug/g dry	114	-	-	-
Beryllium	0.5 ug/g dry	0.5	-	-	-
Boron	5.0 ug/g dry	9.8	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	16.5	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	9.7	-	-	-
Copper	5.0 ug/g dry	25.5	-	-	-
Lead	1.0 ug/g dry	8.3	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	3.9	-	-	-
Nickel	5.0 ug/g dry	31.2	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	1.5	-	-	-
Vanadium	10.0 ug/g dry	28.1	-	-	-
Zinc	20.0 ug/g dry	35.6	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	62.6%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	11	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	54	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	61	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Certificate of Analysis

Report Date: 30-May-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 20-May-2022

Client PO: **54708**

Project Description: PE4597

	Client ID:	BS-A9-1	BS-19-1	-	-
	Sample Date:	18-May-22 09:00	18-May-22 09:00	-	-
	Sample ID:	2221636-05	2221636-06	-	-
	MDL/Units	Soil	Soil	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	-	-
Anthracene	0.02 ug/g dry	<0.02	<0.02	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.02	<0.02	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	-	-
Chrysene	0.02 ug/g dry	<0.02	<0.02	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	-	-
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	-	-
Fluorene	0.02 ug/g dry	<0.02	<0.02	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	-	-
Naphthalene	0.01 ug/g dry	<0.01	<0.01	-	-
Phenanthrene	0.02 ug/g dry	0.05	0.04	-	-
Pyrene	0.02 ug/g dry	<0.02	<0.02	-	-
2-Fluorobiphenyl	Surrogate	107%	91.2%	-	-
Terphenyl-d14	Surrogate	149% [3]	106%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.47*		*ug/g*		*110*	*50-140*			
Surrogate: Terphenyl-d14	*1.71*		*ug/g*		*128*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*2.36*		*ug/g*		*73.7*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	22	8	ug/g	21			2.4	30	
F4 PHCs (C34-C50)	7	6	ug/g	10			28.0	30	
Metals									
Antimony	3.2	1.0	ug/g	ND			NC	30	
Arsenic	6.7	1.0	ug/g	6.3			6.8	30	
Barium	99.0	1.0	ug/g	96.2			2.8	30	
Beryllium	0.9	0.5	ug/g	0.8			13.4	30	
Boron	11.5	5.0	ug/g	10.3			11.7	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	23.7	5.0	ug/g	21.8			8.5	30	
Cobalt	15.7	1.0	ug/g	14.3			9.3	30	
Copper	34.8	5.0	ug/g	31.5			10.2	30	
Lead	14.6	1.0	ug/g	11.5			23.9	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	30.1	5.0	ug/g	27.5			9.0	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	32.8	10.0	ug/g	30.0			8.7	30	
Zinc	70.2	20.0	ug/g	68.1			3.1	30	
Physical Characteristics									
% Solids	91.7	0.1	% by Wt.	92.4			0.8	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*0.864*		*ug/g*		*56.7*	*50-140*			
Surrogate: Terphenyl-d14	*0.914*		*ug/g*		*60.0*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*2.43*		*ug/g*		*71.4*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	195	7	ug/g	ND	97.7	80-120			
F2 PHCs (C10-C16)	86	4	ug/g	ND	96.5	60-140			
F3 PHCs (C16-C34)	222	8	ug/g	21	92.4	60-140			
F4 PHCs (C34-C50)	139	6	ug/g	10	94.3	60-140			
Metals									
Antimony	46.8	1.0	ug/g	ND	93.3	70-130			
Arsenic	65.3	1.0	ug/g	2.5	126	70-130			
Barium	108	1.0	ug/g	46.3	123	70-130			
Beryllium	57.6	0.5	ug/g	ND	115	70-130			
Boron	61.1	5.0	ug/g	ND	114	70-130			
Cadmium	58.4	0.5	ug/g	ND	117	70-130			
Chromium (VI)	0.1	0.2	ug/g	ND	72.0	70-130			
Chromium	73.4	5.0	ug/g	8.7	129	70-130			
Cobalt	67.7	1.0	ug/g	5.7	124	70-130			
Copper	73.8	5.0	ug/g	12.6	122	70-130			
Lead	51.0	1.0	ug/g	4.6	92.8	70-130			
Mercury	1.50	0.1	ug/g	ND	99.9	70-130			
Molybdenum	60.3	1.0	ug/g	ND	120	70-130			
Nickel	72.5	5.0	ug/g	11.0	123	70-130			
Selenium	55.5	1.0	ug/g	ND	111	70-130			
Silver	54.9	0.3	ug/g	ND	110	70-130			
Thallium	58.4	1.0	ug/g	ND	117	70-130			
Uranium	53.3	1.0	ug/g	ND	106	70-130			
Vanadium	75.0	10.0	ug/g	12.3	125	70-130			
Zinc	85.0	20.0	ug/g	27.2	116	70-130			
Semi-Volatiles									
Acenaphthene	0.200	0.02	ug/g	ND	105	50-140			
Acenaphthylene	0.169	0.02	ug/g	ND	89.0	50-140			
Anthracene	0.178	0.02	ug/g	ND	93.3	50-140			
Benzo [a] anthracene	0.158	0.02	ug/g	ND	83.1	50-140			
Benzo [a] pyrene	0.153	0.02	ug/g	ND	80.3	50-140			
Benzo [b] fluoranthene	0.169	0.02	ug/g	ND	88.9	50-140			
Benzo [g,h,i] perylene	0.134	0.02	ug/g	ND	70.2	50-140			
Benzo [k] fluoranthene	0.155	0.02	ug/g	ND	81.5	50-140			
Chrysene	0.194	0.02	ug/g	ND	102	50-140			
Dibenzo [a,h] anthracene	0.139	0.02	ug/g	ND	72.9	50-140			
Fluoranthene	0.165	0.02	ug/g	ND	86.6	50-140			
Fluorene	0.180	0.02	ug/g	ND	94.7	50-140			
Indeno [1,2,3-cd] pyrene	0.137	0.02	ug/g	ND	71.7	50-140			
1-Methylnaphthalene	0.196	0.02	ug/g	ND	103	50-140			
2-Methylnaphthalene	0.202	0.02	ug/g	ND	106	50-140			
Naphthalene	0.215	0.01	ug/g	ND	113	50-140			
Phenanthrene	0.172	0.02	ug/g	ND	90.6	50-140			
Pyrene	0.183	0.02	ug/g	ND	96.1	50-140			
Surrogate: 2-Fluorobiphenyl	*1.38*		*ug/g*		*90.8*	*50-140*			
Surrogate: Terphenyl-d14	*1.57*		*ug/g*		*103*	*50-140*			
Volatiles									
Benzene	4.34	0.02	ug/g	ND	109	60-130			

Certificate of Analysis

Report Date: 30-May-2022

Client: Paterson Group Consulting Engineers

Order Date: 20-May-2022

Client PO: 54708

Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	4.61	0.05	ug/g	ND	115	60-130			
Toluene	4.32	0.05	ug/g	ND	108	60-130			
m,p-Xylenes	7.38	0.05	ug/g	ND	92.2	60-130			
o-Xylene	4.46	0.05	ug/g	ND	111	60-130			
Surrogate: Toluene-d8	*2.51*		*ug/g*		*78.5*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container and COC sample IDs don't match - Vial ID reads BS-D4-1 and coc reads BS-D3-1

Applies to samples: BS-D3-1

Sample Qualifiers :

3 : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 2221636

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2221636	№ 136615

Client Name: PATERSON GROUP
Contact Name: MIKE BEAUDOIN
Address: 154 Colonnade Rd, S
Telephone: 613-226-7381

Project Ref: PE4597
Quote #:
PO #: 54708
E-mail: mbeaudoin@patersongroup.ca
jandrechek@ " " "

Page 1 of 1

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

☒ REG 153/04 ☐ REG 406/19

☐ Table 1 ☒ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☒ Coarse
☒ Table 3 ☐ Agri/Other
☐ Table

For RSC: ☒ Yes ☐ No

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

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BS-G1-1	S	/	2	18-MAY-2022	/	X		X	X	X	X	
2	BS-F2-1	↓	↓	2	↓	↓	X		X	X	X	X	
3	BS-E1-1			3			X		X	X	X	X	
4	[redacted] BS-D3-1 ✓			2	16-MAY-22		X		X	X	X	X	
5	BS-A9-1			3	18-MAY-2022		X		X	X	X	X	
6	BS-19-1	↓	↓	1	↓	↓			X				
7													
8													
9													
10													

Comments:

Method of Delivery: Swift

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Jumeaarm Dhamsi	Verified By: BSan
Relinquished By (Print): Jesse Andrechek	Date/Time:	Date/Time: May 20 2022 04:14	Date/Time: May 20,22 16:35
Date/Time: May 20, 2022	Temperature: °C	Temperature: 16.0 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 54848
Project: PE4597
Custody: 136632

Report Date: 7-Jun-2022
Order Date: 1-Jun-2022

Order #: 2223405

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

Paracel ID	Client ID
2223405-01	BS-G2-1
2223405-02	BS-C10-3
2223405-03	BS-E6-1
2223405-04	BS-F4-1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 07-Jun-2022

Client: Paterson Group Consulting Engineers

Order Date: 1-Jun-2022

Client PO: 54848

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	3-Jun-22	6-Jun-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	6-Jun-22	6-Jun-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	6-Jun-22	6-Jun-22
PHC F1	CWS Tier 1 - P&T GC-FID	3-Jun-22	6-Jun-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	2-Jun-22	6-Jun-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	6-Jun-22	6-Jun-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	4-Jun-22	6-Jun-22
Solids, %	Gravimetric, calculation	6-Jun-22	7-Jun-22

PARACEL LABORATORIES LTD.

Order #: 2223405

Certificate of Analysis

Report Date: 07-Jun-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 1-Jun-2022

Client PO: **54848**

Project Description: PE4597

	Client ID:	BS-G2-1	BS-C10-3	BS-E6-1	BS-F4-1
	Sample Date:	31-May-22 09:00	30-May-22 09:00	30-May-22 09:00	31-May-22 09:00
	Sample ID:	2223405-01	2223405-02	2223405-03	2223405-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	79.2	92.8	88.0	79.7
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.4	6.6	3.5	1.7
Barium	1.0 ug/g dry	11.0	124	48.9	36.5
Beryllium	0.5 ug/g dry	<0.5	0.6	<0.5	<0.5
Boron	5.0 ug/g dry	<5.0	11.5	5.6	<5.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	8.8	17.4	29.8	18.2
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	2.1	9.5	7.2	4.9
Copper	5.0 ug/g dry	<5.0	27.4	13.9	7.8
Lead	1.0 ug/g dry	1.2	10.5	5.3	2.1
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	3.8	<1.0	<1.0
Nickel	5.0 ug/g dry	<5.0	33.8	18.2	11.2
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	1.7	1.0	<1.0
Vanadium	10.0 ug/g dry	18.8	28.9	58.5	22.3
Zinc	20.0 ug/g dry	<20.0	34.9	34.9	22.9
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	101%	91.5%	97.1%	99.6%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	30	8	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	50	14	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	14	<6	<6

Certificate of Analysis

Report Date: 07-Jun-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 1-Jun-2022

Client PO: **54848**

Project Description: PE4597

	Client ID:	BS-G2-1	BS-C10-3	BS-E6-1	BS-F4-1
	Sample Date:	31-May-22 09:00	30-May-22 09:00	30-May-22 09:00	31-May-22 09:00
	Sample ID:	2223405-01	2223405-02	2223405-03	2223405-04
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	102%	88.0%	109%	74.5%
Terphenyl-d14	Surrogate	118%	99.0%	116%	85.2%

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.06*		*ug/g*		*79.7*	*50-140*			
Surrogate: Terphenyl-d14	*1.34*		*ug/g*		*100*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*2.85*		*ug/g*		*89.0*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	35	7	ug/g	24			37.9	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	214	8	ug/g	217			1.4	30	
F4 PHCs (C34-C50)	232	6	ug/g	267			14.1	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	3.2	1.0	ug/g	4.3			NC	30	
Barium	95.6	1.0	ug/g	135			33.8	30	QM-07
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron	10.6	5.0	ug/g	12.9			19.3	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	18.6	5.0	ug/g	22.8			20.3	30	
Cobalt	5.9	1.0	ug/g	7.5			23.0	30	
Copper	10.3	5.0	ug/g	13.0			23.1	30	
Lead	176	1.0	ug/g	326			60.0	30	QR-05
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	11.1	5.0	ug/g	14.4			26.2	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	37.7	10.0	ug/g	47.1			22.3	30	
Zinc	64.0	20.0	ug/g	82.0			24.8	30	
Physical Characteristics									
% Solids	88.2	0.1	% by Wt.	78.6			11.5	25	
Semi-Volatiles									
Acenaphthene	0.036	0.02	ug/g	0.033			9.8	40	
Acenaphthylene	0.048	0.02	ug/g	0.044			9.2	40	
Anthracene	0.124	0.02	ug/g	0.102			19.2	40	
Benzo [a] anthracene	0.228	0.02	ug/g	0.212			7.4	40	
Benzo [a] pyrene	0.242	0.02	ug/g	0.214			12.2	40	
Benzo [b] fluoranthene	0.205	0.02	ug/g	0.182			12.2	40	
Benzo [g,h,i] perylene	0.130	0.02	ug/g	0.115			12.6	40	
Benzo [k] fluoranthene	0.101	0.02	ug/g	0.091			11.0	40	
Chrysene	0.240	0.02	ug/g	0.219			9.3	40	
Dibenzo [a,h] anthracene	0.029	0.02	ug/g	0.025			14.9	40	
Fluoranthene	0.477	0.02	ug/g	0.427			11.1	40	
Fluorene	0.032	0.02	ug/g	0.027			17.6	40	
Indeno [1,2,3-cd] pyrene	0.108	0.02	ug/g	0.094			13.0	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	0.014	0.01	ug/g	0.011			27.3	40	
Phenanthrene	0.491	0.02	ug/g	0.395			21.5	40	
Pyrene	0.429	0.02	ug/g	0.405			5.8	40	
Surrogate: 2-Fluorobiphenyl	*1.75*		*ug/g*		*111*	*50-140*			
Surrogate: Terphenyl-d14	*1.73*		*ug/g*		*110*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*3.29*		*ug/g*		*92.0*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	236	7	ug/g	ND	118	80-120			
F2 PHCs (C10-C16)	109	4	ug/g	ND	122	60-140			
F3 PHCs (C16-C34)	485	8	ug/g	217	122	60-140			
F4 PHCs (C34-C50)	408	6	ug/g	267	101	60-140			
Metals									
Antimony	52.7	1.0	ug/g	ND	105	70-130			
Arsenic	63.1	1.0	ug/g	1.7	123	70-130			
Barium	112	1.0	ug/g	53.8	116	70-130			
Beryllium	56.5	0.5	ug/g	ND	113	70-130			
Boron	69.0	5.0	ug/g	5.2	128	70-130			
Cadmium	58.0	0.5	ug/g	ND	116	70-130			
Chromium (VI)	5.3	0.2	ug/g	ND	89.0	70-130			
Chromium	69.4	5.0	ug/g	9.1	120	70-130			
Cobalt	61.6	1.0	ug/g	3.0	117	70-130			
Copper	59.9	5.0	ug/g	5.2	109	70-130			
Lead	47.2	1.0	ug/g	ND	92.7	70-130			
Mercury	1.58	0.1	ug/g	ND	105	70-130			
Molybdenum	60.1	1.0	ug/g	ND	119	70-130			
Nickel	61.8	5.0	ug/g	5.8	112	70-130			
Selenium	55.7	1.0	ug/g	ND	111	70-130			
Silver	48.8	0.3	ug/g	ND	97.6	70-130			
Thallium	58.9	1.0	ug/g	ND	118	70-130			
Uranium	58.6	1.0	ug/g	ND	116	70-130			
Vanadium	81.0	10.0	ug/g	18.9	124	70-130			
Zinc	81.7	20.0	ug/g	32.8	97.7	70-130			
Semi-Volatiles									
Acenaphthene	0.210	0.02	ug/g	0.033	89.9	50-140			
Acenaphthylene	0.207	0.02	ug/g	0.044	82.8	50-140			
Anthracene	0.260	0.02	ug/g	0.102	80.0	50-140			
Benzo [a] anthracene	0.347	0.02	ug/g	0.212	68.6	50-140			
Benzo [a] pyrene	0.376	0.02	ug/g	0.214	82.1	50-140			
Benzo [b] fluoranthene	0.381	0.02	ug/g	0.182	101	50-140			
Benzo [g,h,i] perylene	0.255	0.02	ug/g	0.115	71.1	50-140			
Benzo [k] fluoranthene	0.274	0.02	ug/g	0.091	93.0	50-140			
Chrysene	0.394	0.02	ug/g	0.219	88.6	50-140			
Dibenzo [a,h] anthracene	0.171	0.02	ug/g	0.025	74.2	50-140			
Fluoranthene	0.612	0.02	ug/g	0.427	94.0	50-140			
Fluorene	0.191	0.02	ug/g	0.027	83.5	50-140			
Indeno [1,2,3-cd] pyrene	0.246	0.02	ug/g	0.094	76.8	50-140			
1-Methylnaphthalene	0.187	0.02	ug/g	ND	94.8	50-140			
2-Methylnaphthalene	0.203	0.02	ug/g	ND	103	50-140			
Naphthalene	0.203	0.01	ug/g	0.011	97.6	50-140			
Phenanthrene	0.550	0.02	ug/g	0.395	78.3	50-140			
Pyrene	0.577	0.02	ug/g	0.405	87.3	50-140			
Surrogate: 2-Fluorobiphenyl	*1.55*		*ug/g*		*98.1*	*50-140*			
Surrogate: Terphenyl-d14	*1.54*		*ug/g*		*97.5*	*50-140*			
Volatiles									
Benzene	2.64	0.02	ug/g	ND	66.0	60-130			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 54848

Report Date: 07-Jun-2022

Order Date: 1-Jun-2022

Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	4.42	0.05	ug/g	ND	111	60-130			
Toluene	4.85	0.05	ug/g	ND	121	60-130			
m,p-Xylenes	8.89	0.05	ug/g	ND	111	60-130			
o-Xylene	4.86	0.05	ug/g	ND	121	60-130			
Surrogate: Toluene-d8	*3.10*		*ug/g*		*96.9*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - 120mL jar missing sample ID and sample date.

Applies to samples: BS-F4-1

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QR-05 : Duplicate RPDs higher than normally accepted. Remaining batch QA\QC was acceptable. May be sample effect.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 2223405

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2223405	№ 136632

Client Name: PATERSON GROUP	Project Ref: PE4597	Page 1 of 1
Contact Name: Mike Beaudoin	Quote #:	Turnaround Time
Address: 154 Colonnade Rd, S	PO #: 54848	☐ 1 day ☐ 3 day
	E-mail: mbeaudoin@patersongroup.ca jandrechek@	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

☒ REG 153/04 ☐ REG 406/19	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO	
☐ Table 2 ☐ Ind/Comm ☒ Coarse	☐ CCME ☐ MISA	
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm	
☐ Table	Mun:	
For RSC: ☒ Yes ☐ No	☐ Other:	

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)					
1	BS-G2-1	S		3	31-MAY-2022		X		X	X	X	X						
2	BS-C10-3	↓		↓	30-MAY-2022		X		X	X	X	X						
3	BS-E6-1				30-MAY-2022		X		X	X	X	X						
4	BS-F4-1	↓		2	31-MAY-2022		X		X	X	X	X						
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Jineepgrn Bhrmi	Verified By:
Relinquished By (Print): Jesse Andrechek	Date/Time:	Date/Time: June 07, 2022 04.29	Date/Time: June 2, 22 10:00
Date/Time: 1-JUN-2022 3PM	Temperature: °C	Temperature: 17.6 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 32111
Project: PE4597
Custody: 132320

Report Date: 18-Mar-2022
Order Date: 15-Mar-2022

Order #: 2212198

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

Paracel ID	Client ID
2212198-01	BS-G4-1
2212198-02	BS-74-1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 18-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 15-Mar-2022

Client PO: 32111

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	16-Mar-22	16-Mar-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	16-Mar-22	17-Mar-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	17-Mar-22	17-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	16-Mar-22	16-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	15-Mar-22	17-Mar-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	17-Mar-22	18-Mar-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	15-Mar-22	18-Mar-22
Solids, %	Gravimetric, calculation	16-Mar-22	16-Mar-22

Certificate of Analysis

Report Date: 18-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 15-Mar-2022

Client PO: 32111

Project Description: PE4597

	Client ID:	BS-G4-1	BS-74-1	-	-
	Sample Date:	15-Mar-22 09:00	15-Mar-22 09:00	-	-
	Sample ID:	2212198-01	2212198-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	78.9	77.9	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	2.3	-	-	-
Barium	1.0 ug/g dry	53.0	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	<5.0	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	26.6	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	6.1	-	-	-
Copper	5.0 ug/g dry	12.8	-	-	-
Lead	1.0 ug/g dry	3.9	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	5.0 ug/g dry	15.1	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	31.3	-	-	-
Zinc	20.0 ug/g dry	31.3	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene-d8	Surrogate	118%	120%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Certificate of Analysis

Report Date: 18-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 15-Mar-2022

Client PO: 32111

Project Description: PE4597

	Client ID:	BS-G4-1	BS-74-1	-	-
	Sample Date:	15-Mar-22 09:00	15-Mar-22 09:00	-	-
	Sample ID:	2212198-01	2212198-02	-	-
	MDL/Units	Soil	Soil	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	-	-
Anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	<0.02	-	-	-
Pyrene	0.02 ug/g dry	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	105%	-	-	-
Terphenyl-d14	Surrogate	119%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*0.997*		*ug/g*		*74.8*	*50-140*			
Surrogate: Terphenyl-d14	*1.28*		*ug/g*		*96.1*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.32*		*ug/g*		*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	5.2	1.0	ug/g	6.0			14.2	30	
Barium	108	1.0	ug/g	127			16.3	30	
Beryllium	0.9	0.5	ug/g	1.1			11.2	30	
Boron	15.2	5.0	ug/g	17.0			11.2	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	28.9	5.0	ug/g	33.3			14.1	30	
Cobalt	13.3	1.0	ug/g	15.4			15.0	30	
Copper	33.8	5.0	ug/g	38.8			13.8	30	
Lead	14.7	1.0	ug/g	17.0			14.6	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	30.1	5.0	ug/g	34.4			13.4	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	38.6	10.0	ug/g	45.0			15.2	30	
Zinc	85.1	20.0	ug/g	91.3			7.1	30	
Physical Characteristics									
% Solids	17.0	0.1	% by Wt.	16.6			2.5	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*1.29*		*ug/g*		*75.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.63*		*ug/g*		*95.2*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*11.7*		*ug/g*		*113*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	189	7	ug/g	ND	94.5	80-120			
F2 PHCs (C10-C16)	118	4	ug/g	ND	125	60-140			
F3 PHCs (C16-C34)	320	8	ug/g	ND	139	60-140			
F4 PHCs (C34-C50)	203	6	ug/g	ND	139	60-140			
Metals									
Antimony	48.1	1.0	ug/g	ND	95.8	70-130			
Arsenic	53.4	1.0	ug/g	1.3	104	70-130			
Barium	110	1.0	ug/g	52.6	115	70-130			
Beryllium	52.4	0.5	ug/g	ND	104	70-130			
Boron	53.6	5.0	ug/g	ND	99.7	70-130			
Cadmium	51.3	0.5	ug/g	ND	102	70-130			
Chromium (VI)	4.1	0.2	ug/g	ND	64.0	70-130			QM-05
Chromium	65.3	5.0	ug/g	10.8	109	70-130			
Cobalt	56.0	1.0	ug/g	3.3	105	70-130			
Copper	56.6	5.0	ug/g	6.1	101	70-130			
Lead	53.4	1.0	ug/g	4.1	98.6	70-130			
Mercury	1.56	0.1	ug/g	ND	104	70-130			
Molybdenum	54.1	1.0	ug/g	ND	108	70-130			
Nickel	57.5	5.0	ug/g	6.6	102	70-130			
Selenium	51.3	1.0	ug/g	ND	102	70-130			
Silver	54.8	0.3	ug/g	ND	110	70-130			
Thallium	53.2	1.0	ug/g	ND	106	70-130			
Uranium	51.3	1.0	ug/g	ND	102	70-130			
Vanadium	72.0	10.0	ug/g	15.9	112	70-130			
Zinc	77.5	20.0	ug/g	26.3	102	70-130			
Semi-Volatiles									
Acenaphthene	0.224	0.02	ug/g	ND	105	50-140			
Acenaphthylene	0.177	0.02	ug/g	ND	83.0	50-140			
Anthracene	0.179	0.02	ug/g	ND	83.7	50-140			
Benzo [a] anthracene	0.146	0.02	ug/g	ND	68.5	50-140			
Benzo [a] pyrene	0.170	0.02	ug/g	ND	79.7	50-140			
Benzo [b] fluoranthene	0.202	0.02	ug/g	ND	94.7	50-140			
Benzo [g,h,i] perylene	0.185	0.02	ug/g	ND	86.5	50-140			
Benzo [k] fluoranthene	0.187	0.02	ug/g	ND	87.5	50-140			
Chrysene	0.205	0.02	ug/g	ND	95.8	50-140			
Dibenzo [a,h] anthracene	0.175	0.02	ug/g	ND	82.1	50-140			
Fluoranthene	0.184	0.02	ug/g	ND	86.0	50-140			
Fluorene	0.204	0.02	ug/g	ND	95.4	50-140			
Indeno [1,2,3-cd] pyrene	0.151	0.02	ug/g	ND	70.8	50-140			
1-Methylnaphthalene	0.244	0.02	ug/g	ND	114	50-140			
2-Methylnaphthalene	0.266	0.02	ug/g	ND	124	50-140			
Naphthalene	0.244	0.01	ug/g	ND	114	50-140			
Phenanthrene	0.206	0.02	ug/g	ND	96.5	50-140			
Pyrene	0.183	0.02	ug/g	ND	85.6	50-140			
Surrogate: 2-Fluorobiphenyl	*1.78*		*ug/g*		*104*	*50-140*			
Surrogate: Terphenyl-d14	*2.02*		*ug/g*		*119*	*50-140*			
Volatiles									
Benzene	3.44	0.02	ug/g	ND	85.9	60-130			

Certificate of Analysis

Report Date: 18-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 15-Mar-2022

Client PO: 32111

Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	3.60	0.05	ug/g	ND	89.9	60-130			
Toluene	3.85	0.05	ug/g	ND	96.3	60-130			
m,p-Xylenes	7.05	0.05	ug/g	ND	88.1	60-130			
o-Xylene	3.51	0.05	ug/g	ND	87.8	60-130			
Surrogate: Toluene-d8	*7.80*		*ug/g*		*97.6*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 2212198

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2212198	№ 132320

Client Name: Paterson Group	Project Ref: PE4597	Page 1 of 1
Contact Name: Mike Beaudoin	Quote #:	Turnaround Time
Address: 154 Colonnade Rd, S	PO #: 32111	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-226-7381	E-mail: jandrechek@patersongroup.ca mbeaudoin@ " " "	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☒ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table	Mun:
For RSC: ☒ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	BTEX
1	BS-G4-1	S	/	2	15-MAR-2022	/	X		X	X	X	X		
2	BS-74-1	S	/	2	15-MAR-2022	/								X
3														
4														
5														
6														
7														
8														
9														
10														

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: A. Fecuse	Received at Lab: Jineepam Dhamal	Verified By:
Relinquished By (Print): Jesse Andrechek	Date/Time: 15/03/22 3:50	Date/Time: MAR 15, 2022 04:26	Date/Time: March 15 2022 9:39
Date/Time: 15-MAR-2022 2:30PM	Temperature: °C	Temperature: 11.6 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 32077
Project: PE4597
Custody: 135664

Report Date: 29-Mar-2022
Order Date: 23-Mar-2022

Order #: 2213345

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

Paracel ID	Client ID
2213345-01	BS-G10-2

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 29-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 23-Mar-2022

Client PO: 32077

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	24-Mar-22	24-Mar-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	24-Mar-22	25-Mar-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	25-Mar-22	25-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	24-Mar-22	24-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	24-Mar-22	25-Mar-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	25-Mar-22	25-Mar-22
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	24-Mar-22	28-Mar-22
Solids, %	Gravimetric, calculation	24-Mar-22	24-Mar-22

Certificate of Analysis

Report Date: 29-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 23-Mar-2022

Client PO: 32077

Project Description: PE4597

	Client ID:	BS-G10-2	-	-	-
	Sample Date:	23-Mar-22 09:00	-	-	-
	Sample ID:	2213345-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	92.6	-	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	3.6	-	-	-
Barium	1.0 ug/g dry	54.8	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	7.3	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	31.6	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	9.2	-	-	-
Copper	5.0 ug/g dry	19.1	-	-	-
Lead	1.0 ug/g dry	7.7	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	5.0 ug/g dry	24.9	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	1.2	-	-	-
Vanadium	10.0 ug/g dry	58.7	-	-	-
Zinc	20.0 ug/g dry	43.5	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	109%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	8	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	11	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Certificate of Analysis

Report Date: 29-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 23-Mar-2022

Client PO: 32077

Project Description: PE4597

	Client ID:	BS-G10-2	-	-	-
	Sample Date:	23-Mar-22 09:00	-	-	-
	Sample ID:	2213345-01	-	-	-
	MDL/Units	Soil	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	-	-
Anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	<0.02	-	-	-
Pyrene	0.02 ug/g dry	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	96.0%	-	-	-
Terphenyl-d14	Surrogate	109%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.29*		*ug/g*		*97.0*	*50-140*			
Surrogate: Terphenyl-d14	*1.50*		*ug/g*		*112*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.34*		*ug/g*		*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Antimony	3.4	1.0	ug/g	ND			NC	30	
Arsenic	5.5	1.0	ug/g	5.2			4.0	30	
Barium	60.5	1.0	ug/g	66.4			9.3	30	
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron	21.0	5.0	ug/g	20.0			5.2	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	17.2	5.0	ug/g	16.4			4.7	30	
Cobalt	3.3	1.0	ug/g	3.7			10.2	30	
Copper	50.0	5.0	ug/g	54.1			7.9	30	
Lead	15.2	1.0	ug/g	15.7			3.4	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	1.5	1.0	ug/g	1.3			18.3	30	
Nickel	8.8	5.0	ug/g	9.8			10.2	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	11.8	10.0	ug/g	12.8			7.9	30	
Zinc	107	20.0	ug/g	120			11.8	30	
Physical Characteristics									
% Solids	83.7	0.1	% by Wt.	80.8			3.5	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*1.35*		*ug/g*		*94.1*	*50-140*			
Surrogate: Terphenyl-d14	*1.61*		*ug/g*		*112*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*9.47*		*ug/g*		*108*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	168	7	ug/g	ND	83.8	80-120			
F2 PHCs (C10-C16)	88	4	ug/g	ND	100	60-140			
F3 PHCs (C16-C34)	207	8	ug/g	ND	96.7	60-140			
F4 PHCs (C34-C50)	135	6	ug/g	ND	99.8	60-140			
Metals									
Antimony	57.1	1.0	ug/g	ND	114	70-130			
Arsenic	57.1	1.0	ug/g	2.1	110	70-130			
Barium	77.5	1.0	ug/g	26.6	102	70-130			
Beryllium	54.9	0.5	ug/g	ND	109	70-130			
Boron	60.8	5.0	ug/g	8.0	106	70-130			
Cadmium	52.5	0.5	ug/g	ND	105	70-130			
Chromium (VI)	0.2	0.2	ug/g	ND	85.5	70-130			
Chromium	62.0	5.0	ug/g	6.6	111	70-130			
Cobalt	56.8	1.0	ug/g	1.5	111	70-130			
Copper	74.2	5.0	ug/g	21.6	105	70-130			
Lead	58.1	1.0	ug/g	6.3	104	70-130			
Mercury	1.36	0.1	ug/g	ND	90.9	70-130			
Molybdenum	54.4	1.0	ug/g	ND	108	70-130			
Nickel	56.5	5.0	ug/g	ND	105	70-130			
Selenium	52.5	1.0	ug/g	ND	105	70-130			
Silver	61.2	0.3	ug/g	ND	122	70-130			
Thallium	49.0	1.0	ug/g	ND	97.9	70-130			
Uranium	52.3	1.0	ug/g	ND	104	70-130			
Vanadium	60.2	10.0	ug/g	ND	110	70-130			
Zinc	92.7	20.0	ug/g	48.1	89.2	70-130			
Semi-Volatiles									
Acenaphthene	0.205	0.02	ug/g	ND	114	50-140			
Acenaphthylene	0.161	0.02	ug/g	ND	89.5	50-140			
Anthracene	0.154	0.02	ug/g	ND	85.8	50-140			
Benzo [a] anthracene	0.154	0.02	ug/g	ND	85.6	50-140			
Benzo [a] pyrene	0.148	0.02	ug/g	ND	82.5	50-140			
Benzo [b] fluoranthene	0.162	0.02	ug/g	ND	90.3	50-140			
Benzo [g,h,i] perylene	0.122	0.02	ug/g	ND	67.9	50-140			
Benzo [k] fluoranthene	0.190	0.02	ug/g	ND	106	50-140			
Chrysene	0.210	0.02	ug/g	ND	117	50-140			
Dibenzo [a,h] anthracene	0.129	0.02	ug/g	ND	71.5	50-140			
Fluoranthene	0.160	0.02	ug/g	ND	88.7	50-140			
Fluorene	0.182	0.02	ug/g	ND	101	50-140			
Indeno [1,2,3-cd] pyrene	0.143	0.02	ug/g	ND	79.5	50-140			
1-Methylnaphthalene	0.205	0.02	ug/g	ND	114	50-140			
2-Methylnaphthalene	0.219	0.02	ug/g	ND	122	50-140			
Naphthalene	0.211	0.01	ug/g	ND	117	50-140			
Phenanthrene	0.182	0.02	ug/g	ND	101	50-140			
Pyrene	0.169	0.02	ug/g	ND	93.9	50-140			
Surrogate: 2-Fluorobiphenyl	*1.33*		*ug/g*		*92.7*	*50-140*			
Surrogate: Terphenyl-d14	*1.57*		*ug/g*		*109*	*50-140*			
Volatiles									
Benzene	3.55	0.02	ug/g	ND	88.8	60-130			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 32077

Report Date: 29-Mar-2022

Order Date: 23-Mar-2022

Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	4.02	0.05	ug/g	ND	100	60-130			
Toluene	4.19	0.05	ug/g	ND	105	60-130			
m,p-Xylenes	7.75	0.05	ug/g	ND	96.8	60-130			
o-Xylene	3.92	0.05	ug/g	ND	98.0	60-130			
Surrogate: Toluene-d8	*7.96*		*ug/g*		*99.5*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 2213345

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2213345	№ 135664

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

Project Ref: PE4597
Quote #:
PO #: 32077
E-mail: mbeaudoin@patersongroup.ca
jandrechek@ " " "

Page 1 of 1

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

☒ REG 153/04 ☐ REG 406/19

Other Regulation

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

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

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BS-G10-2	S	/	4	23-MAR-2022	—	X		X	X	X	X	
2													
3													
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign): J. Andrechek
Relinquished By (Print): Jesse Andrechuk
Date/Time: 23-MAR-2022 2:30pm

Received By Driver/Depot:
Date/Time:
Temperature: °C

Received at Lab: Vancouver Edmonton
Date/Time: MAR 23, 2022 02.27
Temperature: 12.5 °C

Verified By:
Date/Time: March 23, 22 14:50
pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Rd South
Nepean, ON K2E 7J5
Attn: Mark St. Pierre

Client PO: 26463
Project: PE4597
Custody: 121670

Report Date: 15-Dec-2020
Order Date: 25-Apr-2019

Revised Report

Order #: 1917553

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

Paracel ID	Client ID
1917553-01	BH1-GW1
1917553-02	BH2-GW1
1917553-03	BH3-GW1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 15-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 25-Apr-2019

Client PO: 26463

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - water	MOE E3056 - colourimetric	26-Apr-19	26-Apr-19
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	26-Apr-19	26-Apr-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	30-Apr-19	30-Apr-19
PHC F1	CWS Tier 1 - P&T GC-FID	27-Apr-19	29-Apr-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	27-Apr-19	30-Apr-19
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	29-Apr-19	1-May-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	27-Apr-19	29-Apr-19

Certificate of Analysis

Report Date: 15-Dec-2020

Client: **Paterson Group Consulting Engineers**

Order Date: 25-Apr-2019

Client PO: 26463

Project Description: PE4597

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	25-Apr-19 07:24	25-Apr-19 07:24	25-Apr-19 07:24	-
	Sample ID:	1917553-01	1917553-02	1917553-03	-
	MDL/Units	Water	Water	Water	-
Metals					
Mercury	0.1 ug/L	-	<0.1	-	-
Antimony	0.5 ug/L	-	5.0	-	-
Arsenic	1 ug/L	-	<1	-	-
Barium	1 ug/L	-	303	-	-
Beryllium	0.5 ug/L	-	<0.5	-	-
Boron	10 ug/L	-	65	-	-
Cadmium	0.1 ug/L	-	1.1	-	-
Chromium	1 ug/L	-	<1	-	-
Chromium (VI)	10 ug/L	-	<10	-	-
Cobalt	0.5 ug/L	-	0.8	-	-
Copper	0.5 ug/L	-	7.8	-	-
Lead	0.1 ug/L	-	0.8	-	-
Molybdenum	0.5 ug/L	-	0.8	-	-
Nickel	1 ug/L	-	7	-	-
Selenium	1 ug/L	-	6	-	-
Silver	0.1 ug/L	-	<0.1	-	-
Sodium	200 ug/L	-	360000	-	-
Thallium	0.1 ug/L	-	<0.1	-	-
Uranium	0.1 ug/L	-	1.3	-	-
Vanadium	0.5 ug/L	-	0.6	-	-
Zinc	5 ug/L	-	453	-	-
Volatiles					
Acetone	5.0 ug/L	44.5	-	<5.0	-
Benzene	0.5 ug/L	<0.5	-	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	-	<0.5	-
Bromoform	0.5 ug/L	<0.5	-	<0.5	-
Bromomethane	0.5 ug/L	<0.5	-	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	-	<0.5	-
Chloroform	0.5 ug/L	<0.5	-	<0.5	-
Dibromochloromethane	0.5 ug/L	<0.5	-	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	<1.0	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	<0.5	-

Certificate of Analysis

Report Date: 15-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 25-Apr-2019

Client PO: 26463

Project Description: PE4597

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	25-Apr-19 07:24	25-Apr-19 07:24	25-Apr-19 07:24	-
	Sample ID:	1917553-01	1917553-02	1917553-03	-
	MDL/Units	Water	Water	Water	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	-	4.4	-
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	-	<0.2	-
Hexane	1.0 ug/L	<1.0	-	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	<5.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	-	<5.0	-
Styrene	0.5 ug/L	<0.5	-	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	<0.5	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	<0.5	-
Toluene	0.5 ug/L	<0.5	-	5.0	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	<0.5	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	-	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	<1.0	-
Vinyl chloride	0.5 ug/L	<0.5	-	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	-	5.0	-
o-Xylene	0.5 ug/L	<0.5	-	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	-	5.0	-
4-Bromofluorobenzene	Surrogate	98.9%	-	90.8%	-
Dibromofluoromethane	Surrogate	117%	-	108%	-
Toluene-d8	Surrogate	103%	-	100%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	<100	-

Certificate of Analysis

Report Date: 15-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 25-Apr-2019

Client PO: 26463

Project Description: PE4597

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	25-Apr-19 07:24	25-Apr-19 07:24	25-Apr-19 07:24	-
	Sample ID:	1917553-01	1917553-02	1917553-03	-
	MDL/Units	Water	Water	Water	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	<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	-	0.04	-	-
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	-	0.04	-	-
2-Fluorobiphenyl	Surrogate	-	76.3%	-	-
Terphenyl-d14	Surrogate	-	118%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
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	*25.5*		*ug/L*		*127*	*50-140*			
Surrogate: Terphenyl-d14	*23.7*		*ug/L*		*119*	*50-140*			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*91.0*		*ug/L*		*114*	*50-140*			
Surrogate: Dibromofluoromethane	*78.0*		*ug/L*		*97.5*	*50-140*			
Surrogate: Toluene-d8	*78.2*		*ug/L*		*97.8*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.61	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	20.9	1	ug/L	21.3			1.9	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	20	10	ug/L	19			5.0	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.85	0.5	ug/L	0.85			0.6	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	1.15	0.5	ug/L	1.05			9.3	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	16000	200	ug/L	16500			3.3	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	6	5	ug/L	8			NC	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	

Certificate of Analysis

Report Date: 15-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 25-Apr-2019

Client PO: 26463

Project Description: PE4597

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*89.2*		*ug/L*		*111*	*50-140*			
Surrogate: Dibromofluoromethane	*81.9*		*ug/L*		*102*	*50-140*			
Surrogate: Toluene-d8	*77.7*		*ug/L*		*97.1*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1860	25	ug/L	ND	93.0	68-117			
F2 PHCs (C10-C16)	1480	100	ug/L	ND	92.3	60-140			
F3 PHCs (C16-C34)	3820	100	ug/L	ND	97.4	60-140			
F4 PHCs (C34-C50)	1960	100	ug/L	ND	78.8	60-140			
Metals									
Mercury	3.24	0.1	ug/L	ND	108	70-130			
Antimony	37.1	0.5	ug/L	ND	74.2	80-120			QM-07
Arsenic	44.4	1	ug/L	ND	88.8	80-120			
Barium	58.8	1	ug/L	21.3	74.9	80-120			QM-07
Beryllium	43.3	0.5	ug/L	ND	86.5	80-120			
Boron	57	10	ug/L	19	76.2	80-120			QM-07
Cadmium	41.4	0.1	ug/L	ND	82.7	80-120			
Chromium (VI)	200	10	ug/L	ND	100	70-130			
Chromium	43.7	1	ug/L	ND	87.4	80-120			
Cobalt	41.0	0.5	ug/L	ND	82.1	80-120			
Copper	42.2	0.5	ug/L	0.85	82.8	80-120			
Lead	42.8	0.1	ug/L	ND	85.5	80-120			
Molybdenum	44.3	0.5	ug/L	ND	88.6	80-120			
Nickel	42.5	1	ug/L	ND	85.0	80-120			
Selenium	45.4	1	ug/L	ND	90.7	80-120			
Silver	42.9	0.1	ug/L	ND	85.8	80-120			
Sodium	23400	200	ug/L	16500	69.2	80-120			QM-07
Thallium	39.6	0.1	ug/L	ND	79.2	80-120			QM-07
Uranium	43.9	0.1	ug/L	ND	87.7	80-120			
Vanadium	43.2	0.5	ug/L	ND	86.4	80-120			
Zinc	48	5	ug/L	8	80.5	80-120			
Semi-Volatiles									
Acenaphthene	3.77	0.05	ug/L	ND	75.5	50-140			
Acenaphthylene	3.56	0.05	ug/L	ND	71.2	50-140			
Anthracene	3.55	0.01	ug/L	ND	70.9	50-140			
Benzo [a] anthracene	3.68	0.01	ug/L	ND	73.6	50-140			
Benzo [a] pyrene	3.58	0.01	ug/L	ND	71.5	50-140			
Benzo [b] fluoranthene	5.28	0.05	ug/L	ND	106	50-140			
Benzo [g,h,i] perylene	3.74	0.05	ug/L	ND	74.9	50-140			
Benzo [k] fluoranthene	5.10	0.05	ug/L	ND	102	50-140			
Chrysene	4.25	0.05	ug/L	ND	85.0	50-140			
Dibenzo [a,h] anthracene	4.25	0.05	ug/L	ND	84.9	50-140			
Fluoranthene	3.86	0.01	ug/L	ND	77.3	50-140			
Fluorene	3.62	0.05	ug/L	ND	72.3	50-140			
Indeno [1,2,3-cd] pyrene	4.20	0.05	ug/L	ND	84.0	50-140			
1-Methylnaphthalene	3.44	0.05	ug/L	ND	68.8	50-140			
2-Methylnaphthalene	3.84	0.05	ug/L	ND	76.7	50-140			
Naphthalene	3.89	0.05	ug/L	ND	77.9	50-140			
Phenanthrene	3.52	0.05	ug/L	ND	70.3	50-140			
Pyrene	3.86	0.01	ug/L	ND	77.2	50-140			
Surrogate: 2-Fluorobiphenyl	*13.9*		*ug/L*		*69.6*	*50-140*			
Surrogate: Terphenyl-d14	*24.7*		*ug/L*		*124*	*50-140*			
Volatiles									

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	134	5.0	ug/L	ND	134	50-140			
Benzene	37.9	0.5	ug/L	ND	94.8	60-130			
Bromodichloromethane	35.4	0.5	ug/L	ND	88.4	60-130			
Bromoform	41.4	0.5	ug/L	ND	103	60-130			
Bromomethane	30.0	0.5	ug/L	ND	74.9	50-140			
Carbon Tetrachloride	32.4	0.2	ug/L	ND	81.1	60-130			
Chlorobenzene	42.7	0.5	ug/L	ND	107	60-130			
Chloroform	39.4	0.5	ug/L	ND	98.6	60-130			
Dibromochloromethane	38.4	0.5	ug/L	ND	95.9	60-130			
Dichlorodifluoromethane	44.7	1.0	ug/L	ND	112	50-140			
1,2-Dichlorobenzene	40.4	0.5	ug/L	ND	101	60-130			
1,3-Dichlorobenzene	41.1	0.5	ug/L	ND	103	60-130			
1,4-Dichlorobenzene	40.0	0.5	ug/L	ND	100	60-130			
1,1-Dichloroethane	35.0	0.5	ug/L	ND	87.4	60-130			
1,2-Dichloroethane	38.1	0.5	ug/L	ND	95.4	60-130			
1,1-Dichloroethylene	35.2	0.5	ug/L	ND	88.1	60-130			
cis-1,2-Dichloroethylene	38.6	0.5	ug/L	ND	96.4	60-130			
trans-1,2-Dichloroethylene	35.8	0.5	ug/L	ND	89.4	60-130			
1,2-Dichloropropane	38.6	0.5	ug/L	ND	96.6	60-130			
cis-1,3-Dichloropropylene	43.3	0.5	ug/L	ND	108	60-130			
trans-1,3-Dichloropropylene	41.0	0.5	ug/L	ND	103	60-130			
Ethylbenzene	39.3	0.5	ug/L	ND	98.3	60-130			
Ethylene dibromide (dibromoethane, 1,2-	39.0	0.2	ug/L	ND	97.5	60-130			
Hexane	41.0	1.0	ug/L	ND	102	60-130			
Methyl Ethyl Ketone (2-Butanone)	107	5.0	ug/L	ND	107	50-140			
Methyl Isobutyl Ketone	110	5.0	ug/L	ND	110	50-140			
Methyl tert-butyl ether	88.5	2.0	ug/L	ND	88.5	50-140			
Methylene Chloride	35.0	5.0	ug/L	ND	87.6	60-130			
Styrene	36.1	0.5	ug/L	ND	90.2	60-130			
1,1,1,2-Tetrachloroethane	37.1	0.5	ug/L	ND	92.8	60-130			
1,1,2,2-Tetrachloroethane	43.1	0.5	ug/L	ND	108	60-130			
Tetrachloroethylene	41.8	0.5	ug/L	ND	104	60-130			
Toluene	41.5	0.5	ug/L	ND	104	60-130			
1,1,1-Trichloroethane	35.3	0.5	ug/L	ND	88.2	60-130			
1,1,2-Trichloroethane	39.4	0.5	ug/L	ND	98.6	60-130			
Trichloroethylene	41.0	0.5	ug/L	ND	103	60-130			
Trichlorofluoromethane	38.2	1.0	ug/L	ND	95.5	60-130			
Vinyl chloride	29.5	0.5	ug/L	ND	73.8	50-140			
m,p-Xylenes	82.9	0.5	ug/L	ND	104	60-130			
o-Xylene	43.0	0.5	ug/L	ND	107	60-130			
Surrogate: 4-Bromofluorobenzene	*86.5*		*ug/L*		*108*	*50-140*			
Surrogate: Dibromofluoromethane	*76.4*		*ug/L*		*95.5*	*50-140*			
Surrogate: Toluene-d8	*69.3*		*ug/L*		*86.6*	*50-140*			

Qualifier Notes:

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

REVISION-1 This report includes an updated parameter list.

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 1917553

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Chain of Custody
(Lab Use Only)
No. 121670

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE4597	**Turnaround Time:**	
Contact Name: Mark St Pierre / MIKE BEAUDOIN	Quote #	☐ 1 Day	☐ 3 Day
Address: 154 Colonnade Road South	PO # 26463	☐ 2 Day	☒ Regular
Telephone: 613-226-7381	Email Address: mstpierre@patersongroup.ca mbeaudoin@patersongroup.ca	Date Required:	

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

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

Required Analyses

	Paracel Order Number: 1917553 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	BH1-GW1	GW		3	Apr. 25, 2019	7:24	✓													✓
2	BH2-GW1	GW		4	↓	8:10			✓	✓	✓	✓								✓
3	BH3-GW1	GW		3	↓	9:05	X	X		~~✓~~	~~✓~~	~~✓~~								✓
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Pardel

Relinquished By (Sign):	Received by Driver/Depot: M. Dewse	Received at Lab: Simerjeet DHUMAL	Verified By: MW/AS
Relinquished By (Print): MIKE B.	Date/Time: 25/04/19 4:00 pm	Date/Time: APR 25 2019 05:04	Date/Time: 04-25-19 17:38
Date/Time:	Temperature: °C	Temperature: 15.9	pH Verified ☒ By: MW

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Certificate of Analysis

Paterson Group Consulting Engineers

9 Auriga Drive
Ottawa, ON K2E 7T9
Attn: Mike Beaudoin

Client PO: 56820
Project: PE4597
Custody:

Report Date: 22-Feb-2023
Order Date: 15-Feb-2023

Order #: 2307293

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

Paracel ID	Client ID
2307293-01	BH1-23-GW1
2307293-02	BH2-23-GW1
2307293-03	BH3-23-GW1
2307293-04	BH4-23-GW1
2307293-05	DUP

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 22-Feb-2023

Client: Paterson Group Consulting Engineers

Order Date: 15-Feb-2023

Client PO: 56820

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - water	MOE E3056 - colourimetric	22-Feb-23	22-Feb-23
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	17-Feb-23	17-Feb-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	17-Feb-23	17-Feb-23
PHC F1	CWS Tier 1 - P&T GC-FID	16-Feb-23	16-Feb-23
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	17-Feb-23	17-Feb-23
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	17-Feb-23	17-Feb-23
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	16-Feb-23	16-Feb-23

Certificate of Analysis

Report Date: 22-Feb-2023

Client: Paterson Group Consulting Engineers

Order Date: 15-Feb-2023

Client PO: 56820

Project Description: PE4597

	Client ID:	BH1-23-GW1	BH2-23-GW1	BH3-23-GW1	BH4-23-GW1
	Sample Date:	14-Feb-23 09:00	14-Feb-23 09:00	14-Feb-23 09:00	14-Feb-23 09:00
	Sample ID:	2307293-01	2307293-02	2307293-03	2307293-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	3.2	<0.5
Arsenic	1 ug/L	<1	<1	1	<1
Barium	1 ug/L	9	10	38	17
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	341	523	186	380
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	14.3	4.3	2.6	9.3
Copper	0.5 ug/L	<0.5	<0.5	<0.5	2.5
Lead	0.1 ug/L	<0.1	<0.1	0.2	0.1
Molybdenum	0.5 ug/L	6.4	5.1	12.8	6.9
Nickel	1 ug/L	50	50	43	62
Selenium	1 ug/L	<1	<1	2	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	212000	274000	100000	202000
Thallium	0.1 ug/L	0.1	0.1	0.2	0.1
Uranium	0.1 ug/L	11.6	15.6	17.5	12.3
Vanadium	0.5 ug/L	<0.5	<0.5	0.8	<0.5
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 22-Feb-2023

Client: Paterson Group Consulting Engineers

Order Date: 15-Feb-2023

Client PO: 56820

Project Description: PE4597

	Client ID:	BH1-23-GW1	BH2-23-GW1	BH3-23-GW1	BH4-23-GW1
	Sample Date:	14-Feb-23 09:00	14-Feb-23 09:00	14-Feb-23 09:00	14-Feb-23 09:00
	Sample ID:	2307293-01	2307293-02	2307293-03	2307293-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	105%	106%	104%	106%
Dibromofluoromethane	Surrogate	104%	102%	101%	101%
Toluene-d8	Surrogate	106%	106%	106%	105%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100

Certificate of Analysis

Report Date: 22-Feb-2023

Client: Paterson Group Consulting Engineers

Order Date: 15-Feb-2023

Client PO: 56820

Project Description: PE4597

	Client ID:	BH1-23-GW1	BH2-23-GW1	BH3-23-GW1	BH4-23-GW1
	Sample Date:	14-Feb-23 09:00	14-Feb-23 09:00	14-Feb-23 09:00	14-Feb-23 09:00
	Sample ID:	2307293-01	2307293-02	2307293-03	2307293-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
2-Fluorobiphenyl	Surrogate	85.2%	89.9%	84.5%	83.2%
Terphenyl-d14	Surrogate	121%	124%	117%	120%

Certificate of Analysis

Report Date: 22-Feb-2023

Client: **Paterson Group Consulting Engineers**

Order Date: 15-Feb-2023

Client PO: **56820**

Project Description: PE4597

	Client ID:	DUP	-	-	-
	Sample Date:	14-Feb-23 09:00	-	-	-
	Sample ID:	2307293-05	-	-	-
	MDL/Units	Ground Water	-	-	-
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	<0.05	-	-	-
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	88.7%	-	-	-
Terphenyl-d14	Surrogate	120%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
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	*16.8*		*ug/L*		*84.1*	*50-140*			
Surrogate: Terphenyl-d14	*23.4*		*ug/L*		*117*	*50-140*			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*80.1*		*ug/L*		*100*	*50-140*			
Surrogate: Dibromofluoromethane	*66.4*		*ug/L*		*83.0*	*50-140*			
Surrogate: Toluene-d8	*87.9*		*ug/L*		*110*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	0.35	0.1	ug/L	0.36			2.5	20	
Antimony	ND	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	21.3	1	ug/L	20.8			2.1	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	18	10	ug/L	16			12.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.94	0.5	ug/L	0.96			2.2	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	1.04	0.5	ug/L	1.03			0.3	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	18200	200	ug/L	19800			8.5	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	7	5	ug/L	8			4.0	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	5.10	0.5	ug/L	4.16			20.3	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	4.48	0.5	ug/L	3.95			12.6	30	
Dibromochloromethane	3.06	0.5	ug/L	2.48			20.9	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	

Certificate of Analysis

Report Date: 22-Feb-2023

Client: Paterson Group Consulting Engineers

Order Date: 15-Feb-2023

Client PO: 56820

Project Description: PE4597

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*83.0*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*91.3*		*ug/L*		*114*	*50-140*			
Surrogate: Toluene-d8	*84.5*		*ug/L*		*106*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1820	25	ug/L	ND	91.0	68-117			
F2 PHCs (C10-C16)	1470	100	ug/L	ND	91.9	60-140			
F3 PHCs (C16-C34)	3710	100	ug/L	ND	94.7	60-140			
F4 PHCs (C34-C50)	2520	100	ug/L	ND	102	60-140			
Metals									
Mercury	1.58	0.1	ug/L	0.36	81.1	70-130			
Arsenic	50.1	1	ug/L	ND	99.7	80-120			
Barium	62.4	1	ug/L	20.8	83.2	80-120			
Beryllium	47.7	0.5	ug/L	ND	95.3	80-120			
Boron	61	10	ug/L	16	89.6	80-120			
Cadmium	44.0	0.1	ug/L	ND	88.0	80-120			
Chromium (VI)	174	10	ug/L	ND	87.0	70-130			
Chromium	51.1	1	ug/L	ND	102	80-120			
Cobalt	48.1	0.5	ug/L	ND	96.2	80-120			
Copper	47.4	0.5	ug/L	0.96	92.8	80-120			
Lead	42.4	0.1	ug/L	ND	84.8	80-120			
Molybdenum	47.2	0.5	ug/L	1.03	92.4	80-120			
Nickel	48.0	1	ug/L	ND	94.9	80-120			
Selenium	45.7	1	ug/L	ND	91.0	80-120			
Silver	42.8	0.1	ug/L	ND	85.6	80-120			
Sodium	26400	200	ug/L	19800	66.5	80-120			QM-07
Thallium	43.0	0.1	ug/L	ND	86.1	80-120			
Uranium	44.5	0.1	ug/L	ND	89.0	80-120			
Vanadium	51.0	0.5	ug/L	ND	102	80-120			
Zinc	51	5	ug/L	8	87.0	80-120			
Semi-Volatiles									
Acenaphthene	4.56	0.05	ug/L	ND	91.2	50-140			
Acenaphthylene	4.08	0.05	ug/L	ND	81.5	50-140			
Anthracene	4.36	0.01	ug/L	ND	87.1	50-140			
Benzo [a] anthracene	4.36	0.01	ug/L	ND	87.2	50-140			
Benzo [a] pyrene	4.62	0.01	ug/L	ND	92.4	50-140			
Benzo [b] fluoranthene	5.94	0.05	ug/L	ND	119	50-140			
Benzo [g,h,i] perylene	4.41	0.05	ug/L	ND	88.1	50-140			
Benzo [k] fluoranthene	5.97	0.05	ug/L	ND	119	50-140			
Chrysene	4.82	0.05	ug/L	ND	96.3	50-140			
Dibenzo [a,h] anthracene	4.63	0.05	ug/L	ND	92.6	50-140			
Fluoranthene	3.97	0.01	ug/L	ND	79.4	50-140			
Fluorene	4.32	0.05	ug/L	ND	86.5	50-140			
Indeno [1,2,3-cd] pyrene	4.78	0.05	ug/L	ND	95.7	50-140			
1-Methylnaphthalene	4.39	0.05	ug/L	ND	87.8	50-140			
2-Methylnaphthalene	4.70	0.05	ug/L	ND	94.0	50-140			
Naphthalene	4.60	0.05	ug/L	ND	92.1	50-140			
Phenanthrene	4.27	0.05	ug/L	ND	85.5	50-140			
Pyrene	4.11	0.01	ug/L	ND	82.1	50-140			
Surrogate: 2-Fluorobiphenyl	*17.3*		*ug/L*		*86.6*	*50-140*			
Surrogate: Terphenyl-d14	*24.1*		*ug/L*		*121*	*50-140*			
Volatiles									
Acetone	110	5.0	ug/L	ND	110	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	41.2	0.5	ug/L	ND	103	60-130			
Bromodichloromethane	36.4	0.5	ug/L	ND	90.9	60-130			
Bromoform	41.6	0.5	ug/L	ND	104	60-130			
Bromomethane	39.6	0.5	ug/L	ND	98.9	50-140			
Carbon Tetrachloride	33.6	0.2	ug/L	ND	84.0	60-130			
Chlorobenzene	40.5	0.5	ug/L	ND	101	60-130			
Chloroform	37.6	0.5	ug/L	ND	94.0	60-130			
Dibromochloromethane	36.3	0.5	ug/L	ND	90.7	60-130			
Dichlorodifluoromethane	42.4	1.0	ug/L	ND	106	50-140			
1,2-Dichlorobenzene	38.5	0.5	ug/L	ND	96.2	60-130			
1,3-Dichlorobenzene	36.2	0.5	ug/L	ND	90.6	60-130			
1,4-Dichlorobenzene	35.7	0.5	ug/L	ND	89.2	60-130			
1,1-Dichloroethane	34.4	0.5	ug/L	ND	86.0	60-130			
1,2-Dichloroethane	40.8	0.5	ug/L	ND	102	60-130			
1,1-Dichloroethylene	45.4	0.5	ug/L	ND	114	60-130			
cis-1,2-Dichloroethylene	36.1	0.5	ug/L	ND	90.2	60-130			
trans-1,2-Dichloroethylene	33.6	0.5	ug/L	ND	84.0	60-130			
1,2-Dichloropropane	40.0	0.5	ug/L	ND	100	60-130			
cis-1,3-Dichloropropylene	32.0	0.5	ug/L	ND	80.1	60-130			
trans-1,3-Dichloropropylene	29.0	0.5	ug/L	ND	72.6	60-130			
Ethylbenzene	42.2	0.5	ug/L	ND	106	60-130			
Ethylene dibromide (dibromoethane, 1,2-	33.4	0.2	ug/L	ND	83.6	60-130			
Hexane	40.3	1.0	ug/L	ND	101	60-130			
Methyl Ethyl Ketone (2-Butanone)	104	5.0	ug/L	ND	104	50-140			
Methyl Isobutyl Ketone	101	5.0	ug/L	ND	101	50-140			
Methyl tert-butyl ether	72.8	2.0	ug/L	ND	72.8	50-140			
Methylene Chloride	45.6	5.0	ug/L	ND	114	60-130			
Styrene	33.2	0.5	ug/L	ND	83.1	60-130			
1,1,1,2-Tetrachloroethane	34.3	0.5	ug/L	ND	85.7	60-130			
1,1,2,2-Tetrachloroethane	33.8	0.5	ug/L	ND	84.4	60-130			
Tetrachloroethylene	38.1	0.5	ug/L	ND	95.2	60-130			
Toluene	42.0	0.5	ug/L	ND	105	60-130			
1,1,1-Trichloroethane	37.8	0.5	ug/L	ND	94.4	60-130			
1,1,2-Trichloroethane	36.3	0.5	ug/L	ND	90.8	60-130			
Trichloroethylene	35.5	0.5	ug/L	ND	88.8	60-130			
Trichlorofluoromethane	47.0	1.0	ug/L	ND	117	60-130			
Vinyl chloride	32.9	0.5	ug/L	ND	82.2	50-140			
m,p-Xylenes	79.7	0.5	ug/L	ND	99.6	60-130			
o-Xylene	41.1	0.5	ug/L	ND	103	60-130			
Surrogate: 4-Bromofluorobenzene	*79.9*		*ug/L*		*99.9*	*50-140*			
Surrogate: Dibromofluoromethane	*80.6*		*ug/L*		*101*	*50-140*			
Surrogate: Toluene-d8	*84.7*		*ug/L*		*106*	*50-140*			

Qualifier Notes:

QC Qualifiers :

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD. | TRR

Paracel ID: 2307293

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2307293	

Client Name: Paterson	Project Ref: PE4597	Page __ of __
Contact Name: Mike Beaudoin	Quote #:	Turnaround Time
Address: 9 Auriga	PO #: 56820	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 613 226 7381	E-mail: MBeaudoin@patersongroup.ca	Date Required:

☑ REG 153/04 ☐ REG 406/19	Other Regulation
☑ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH1-23-GW1	GW		7	Feb 14 2023		X	X	X	X	X	X							
2	BH2-23-GW1	↓		↓	↓		X	X	X	X	X	X							
3	BH3-23-GW1						X	X	X	X	X	X							
4	BH4-23-GW1						X	X	X	X	X	X							
5	DUP			1					X										
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): GPak	Received By Driver/Depot: A Flouse	Received at Lab:	Verified By: Sandra Domagala
Relinquished By (Print): Grant Paterson	Date/Time: 15/02/23 1617	Date/Time: 15/02/23 1700	Date/Time: Feb 16, 9:55
Date/Time: Feb 15 2023	Temperature: °C	Temperature: 6.2	pH Verified: ☑ By: Sandra Domagala

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Subcontracted Analysis

Paterson Group Consulting Engineers
154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mike Beaudoin

Paracel Report No. **2149585**
Client Project(s): **PE4597**
Client PO: **33472**
Reference: **Standing Offer**
CoC Number:

Order Date: 03-Dec-21
Report Date: 20-Dec-21

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
2149585-01	TP3-21-01	Methyl Mercury - soil
2149585-02	TP7-21-01	Methyl Mercury - soil
2149585-03	TP8-21-01	Methyl Mercury - soil
2149585-04	TP11-21-01	Methyl Mercury - soil
2149585-05	TP12-21-01	Methyl Mercury - soil

PARACEL LABORATORIES LTD (Ottawa-London-Kingston)
ATTN: Mark Foto
300-2319 St. Laurent Blvd.
Ottawa ON K1G 4J8

Date Received: 06-DEC-21
Report Date: 20-DEC-21 07:24 (MT)
Version: FINAL

Client Phone: 613-731-9577

Certificate of Analysis

Lab Work Order #: L2669783

Project P.O. #: NOT SUBMITTED
Job Reference: 2149585
C of C Numbers:
Legal Site Desc:

Costas Farassoglou
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2669783-1 TP3-21-01 Sampled By: CLIENT on 02-DEC-21 @ 15:05 Matrix: WATER							
Physical Tests							
Moisture	41.2		0.25	%		14-DEC-21	R5679430
Speciated Metals							
Methylmercury (as MeHg)	0.000424		0.000050	mg/kg	16-DEC-21	16-DEC-21	R5675560
L2669783-2 TP7-21-01 Sampled By: CLIENT on 02-DEC-21 @ 15:10 Matrix: WATER							
Physical Tests							
Moisture	28.5		0.25	%		14-DEC-21	R5679430
Speciated Metals							
Methylmercury (as MeHg)	0.000655		0.000050	mg/kg	16-DEC-21	16-DEC-21	R5675560
L2669783-3 TP8-21-01 Sampled By: CLIENT on 02-DEC-21 @ 15:15 Matrix: WATER							
Physical Tests							
Moisture	26.3		0.25	%		14-DEC-21	R5679430
Speciated Metals							
Methylmercury (as MeHg)	<0.000050		0.000050	mg/kg	16-DEC-21	16-DEC-21	R5675560
L2669783-4 TP11-21-01 Sampled By: CLIENT on 02-DEC-21 @ 15:20 Matrix: WATER							
Physical Tests							
Moisture	56.6		0.25	%		14-DEC-21	R5679430
Speciated Metals							
Methylmercury (as MeHg)	0.00197		0.000050	mg/kg	16-DEC-21	16-DEC-21	R5675560
L2669783-5 TP12-21-01 Sampled By: CLIENT on 02-DEC-21 @ 15:25 Matrix: WATER							
Physical Tests							
Moisture	71.4		0.25	%		14-DEC-21	R5679430
Speciated Metals							
Methylmercury (as MeHg)	0.00136		0.000050	mg/kg	16-DEC-21	16-DEC-21	R5675560

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MEHG-GCAF-VA	Soil	Methylmercury in Soil by GCAFS	DeWild et al. (2004)/EPA 1630 (mod)

This method follows procedures published by DeWild, Olund, Olsen and Tate (2004) for the US Geological Survey (Techniques and Methods 5A-7). Samples are leached with an acidic copper sulphate solution to solubilize methylmercury for inorganic complexes. The methylmercury is then extracted into dichloromethane and then an aliquot is back extracted into ultra-pure water. The extract is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".

MOISTURE-VA	Soil	Moisture content	CCME PHC in Soil - Tier 1 (mod)

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2669783 Report Date: 20-DEC-21

Client: PARACEL LABORATORIES LTD (Ottawa-London-Kingston)
300-2319 St. Laurent Blvd.
Ottawa ON K1G 4J8
Contact: Mark Foto

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MEHG-GCAF-VA	**Soil**							
Batch R5675560								
WG3673404-5 CRM		**SQC1238-MEHG**						
Methylmercury (as MeHg)			88.5		%		70-130	16-DEC-21
WG3673404-3 LCS								
Methylmercury (as MeHg)			73.9		%		70-130	16-DEC-21
WG3673404-1 MB								
Methylmercury (as MeHg)			<0.000050		mg/kg wwt		0.00005	16-DEC-21
MOISTURE-VA	**Soil**							
Batch R5679430								
WG3674923-3 DUP		**L2669783-1**						
Moisture		41.2	35.5		%	15	20	14-DEC-21
WG3674923-2 LCS								
Moisture			100.8		%		90-110	14-DEC-21
WG3674923-1 MB								
Moisture			<0.25		%		0.25	14-DEC-21

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

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Subcontract Order

L2669783 JD

SENDING LABORATORY:

Paracel Laboratories Ltd.
300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8
Phone: 613-731-9577

Fax: 613-731-9064

RECEIVING LABORATORY:

ALS Laboratory Group (Vancouver)
8081 Lougheed Highway
Burnaby, BC V5A 1W9
Phone: (604) 253-4188

Fax:

INVOICE TO:

Paracel Laboratories Ltd.
300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8
Phone: 613-731-9577

Fax: 613-731-9064

Date Requested: **03-Dec-21**
Project Number: **2149585**
Submitted By: **Patrick Gravel**

Required Regulation	Reg 153
Turnaround Time	Standard

Sample ID	Matrix	Analyses Requested:	Sampled	Comments
TP3-21-01	Soil	Methyl Mercury - soil	02-Dec-21 15:05	
TP7-21-01	Soil	Methyl Mercury - soil	02-Dec-21 15:10	
TP8-21-01	Soil	Methyl Mercury - soil	02-Dec-21 15:15	
TP11-21-01	Soil	Methyl Mercury - soil	02-Dec-21 15:20	
TP12-21-01	Soil	Methyl Mercury - soil	02-Dec-21 15:25	

L2669783-COFC

Please email all results to mfoto@paracellabs.com, dbloom@paracellabs.com, drobertson@paracellabs.com

Released By: Dec 6 2021 11:00 (Date / Time)
Received By: COSTAT F 12/6/21 (Date)

Temperature prior to Shipping: 6.4°C
11.3°C → ICE PACK
12 UBM

12/7/21 1045
7.4

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 26411
Project: PE4597
Custody: 121668

Report Date: 26-Apr-2019
Order Date: 23-Apr-2019

Order #: 1917260

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

Paracel ID	Client ID
1917260-01	BH1-SS3
1917260-02	BH2-SS2
1917260-03	BH3-SS2
1917260-04	BH4-SS3
1917260-05	BH5-SS2

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26411

Report Date: 26-Apr-2019
Order Date: 23-Apr-2019
Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	24-Apr-19	25-Apr-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	24-Apr-19	24-Apr-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	25-Apr-19	25-Apr-19
PHC F1	CWS Tier 1 - P&T GC-FID	24-Apr-19	25-Apr-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	24-Apr-19	25-Apr-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	25-Apr-19	25-Apr-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	22-Apr-19	25-Apr-19
Solids, %	Gravimetric, calculation	25-Apr-19	25-Apr-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26411

Report Date: 26-Apr-2019

Order Date: 23-Apr-2019

Project Description: PE4597

	Client ID:	BH1-SS3	BH2-SS2	BH3-SS2	BH4-SS3
	Sample Date:	04/22/2019 09:00	04/22/2019 09:00	04/22/2019 09:00	04/22/2019 09:00
	Sample ID:	1917260-01	1917260-02	1917260-03	1917260-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	75.2	77.6	80.4	87.1
Metals					
Antimony	1.0 ug/g dry	-	20.1	<1.0	<1.0
Arsenic	1.0 ug/g dry	-	23.5	4.9	3.4
Barium	1.0 ug/g dry	-	1030	76.1	65.1
Beryllium	0.5 ug/g dry	-	0.9	0.5	0.5
Boron	5.0 ug/g dry	-	16.5	<5.0	7.0
Cadmium	0.5 ug/g dry	-	2.1	<0.5	<0.5
Chromium	5.0 ug/g dry	-	40.5	26.8	25.7
Chromium (VI)	0.2 ug/g dry	-	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	-	10.6	8.7	8.3
Copper	5.0 ug/g dry	-	195	22.0	25.9
Lead	1.0 ug/g dry	-	1480	20.0	10.4
Mercury	0.1 ug/g dry	-	3.0	<0.1	<0.1
Molybdenum	1.0 ug/g dry	-	3.8	2.2	1.1
Nickel	5.0 ug/g dry	-	37.5	26.7	27.1
Selenium	1.0 ug/g dry	-	3.7	<1.0	<1.0
Silver	0.3 ug/g dry	-	1.5	<0.3	<0.3
Thallium	1.0 ug/g dry	-	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	-	<1.0	<1.0	1.1
Vanadium	10.0 ug/g dry	-	28.5	41.5	42.1
Zinc	20.0 ug/g dry	-	1120	55.6	48.4
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	99.7%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	146	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	79	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26411

Report Date: 26-Apr-2019

Order Date: 23-Apr-2019

Project Description: PE4597

	Client ID:	BH1-SS3	BH2-SS2	BH3-SS2	BH4-SS3
	Sample Date:	04/22/2019 09:00	04/22/2019 09:00	04/22/2019 09:00	04/22/2019 09:00
	Sample ID:	1917260-01	1917260-02	1917260-03	1917260-04
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	0.26	-	<0.02
Acenaphthylene	0.02 ug/g dry	-	0.36	-	<0.02
Anthracene	0.02 ug/g dry	-	1.22	-	<0.02
Benzo [a] anthracene	0.02 ug/g dry	-	2.56	-	<0.02
Benzo [a] pyrene	0.02 ug/g dry	-	1.96	-	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	-	2.67	-	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	-	0.96	-	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	-	1.53	-	<0.02
Chrysene	0.02 ug/g dry	-	2.79	-	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	0.30	-	<0.02
Fluoranthene	0.02 ug/g dry	-	4.97	-	<0.02
Fluorene	0.02 ug/g dry	-	0.34	-	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	1.02	-	<0.02
1-Methylnaphthalene	0.02 ug/g dry	-	0.13	-	<0.02
2-Methylnaphthalene	0.02 ug/g dry	-	0.18	-	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	-	0.30	-	<0.04
Naphthalene	0.01 ug/g dry	-	0.57	-	<0.01
Phenanthrene	0.02 ug/g dry	-	3.48	-	<0.02
Pyrene	0.02 ug/g dry	-	4.15	-	<0.02
2-Fluorobiphenyl	Surrogate	-	84.8%	-	107%
Terphenyl-d14	Surrogate	-	75.5%	-	98.4%

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26411

Report Date: 26-Apr-2019

Order Date: 23-Apr-2019

Project Description: PE4597

	Client ID:	BH5-SS2	-	-	-
	Sample Date:	04/22/2019 09:00	-	-	-
	Sample ID:	1917260-05	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	90.5	-	-	-
Metals					
Antimony	1.0 ug/g dry	1.3	-	-	-
Arsenic	1.0 ug/g dry	5.3	-	-	-
Barium	1.0 ug/g dry	126	-	-	-
Beryllium	0.5 ug/g dry	0.5	-	-	-
Boron	5.0 ug/g dry	8.1	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	17.9	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	8.1	-	-	-
Copper	5.0 ug/g dry	29.8	-	-	-
Lead	1.0 ug/g dry	46.5	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	3.2	-	-	-
Nickel	5.0 ug/g dry	26.5	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	1.2	-	-	-
Vanadium	10.0 ug/g dry	24.1	-	-	-
Zinc	20.0 ug/g dry	66.8	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26411

Report Date: 26-Apr-2019
Order Date: 23-Apr-2019
Project Description: PE4597

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.41*		*ug/g*		*105*	*50-140*			
Surrogate: Terphenyl-d14	*1.41*		*ug/g*		*106*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.89*		*ug/g*		*111*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	14	8	ug/g dry	18			25.2	30	
F4 PHCs (C34-C50)	11	6	ug/g dry	18			46.8	30	QR-01
Metals									
Antimony	1.1	1.0	ug/g dry	1.2			7.2	30	
Arsenic	3.5	1.0	ug/g dry	3.9			12.2	30	
Barium	120	1.0	ug/g dry	131			8.3	30	
Beryllium	ND	0.5	ug/g dry	ND			0.0	30	
Boron	7.6	5.0	ug/g dry	8.6			11.5	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	16.7	5.0	ug/g dry	19.1			13.8	30	
Cobalt	2.0	1.0	ug/g dry	2.2			8.7	30	
Copper	10.6	5.0	ug/g dry	11.7			9.8	30	
Lead	7.7	1.0	ug/g dry	8.0			3.5	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	1.5	1.0	ug/g dry	1.7			15.0	30	
Nickel	43.4	5.0	ug/g dry	50.4			15.0	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	1.7	1.0	ug/g dry	1.9			10.5	30	
Vanadium	18.8	10.0	ug/g dry	22.9			19.4	30	
Zinc	38.0	20.0	ug/g dry	42.6			11.6	30	
Physical Characteristics									
% Solids	91.2	0.1	% by Wt.	90.7			0.5	25	
Semi-Volatiles									
Acenaphthene	0.095	0.02	ug/g dry	0.129			30.8	40	
Acenaphthylene	0.030	0.02	ug/g dry	0.040			27.4	40	
Anthracene	0.342	0.02	ug/g dry	0.470			31.6	40	
Benzo [a] anthracene	0.641	0.02	ug/g dry	0.866			30.0	40	
Benzo [a] pyrene	0.486	0.02	ug/g dry	0.642			27.6	40	
Benzo [b] fluoranthene	0.680	0.02	ug/g dry	0.897			27.5	40	
Benzo [g,h,i] perylene	0.290	0.02	ug/g dry	0.369			23.8	40	
Benzo [k] fluoranthene	0.364	0.02	ug/g dry	0.487			28.9	40	
Chrysene	0.704	0.02	ug/g dry	0.944			29.1	40	
Dibenzo [a,h] anthracene	0.072	0.02	ug/g dry	0.089			20.5	40	
Fluoranthene	1.65	0.02	ug/g dry	2.30			32.7	40	
Fluorene	0.129	0.02	ug/g dry	0.191			38.5	40	
Indeno [1,2,3-cd] pyrene	0.272	0.02	ug/g dry	0.352			25.6	40	
1-Methylnaphthalene	0.113	0.02	ug/g dry	0.115			1.3	40	
2-Methylnaphthalene	0.123	0.02	ug/g dry	0.115			6.8	40	
Naphthalene	0.039	0.01	ug/g dry	0.041			4.7	40	
Phenanthrene	1.11	0.02	ug/g dry	1.54			32.7	40	
Pyrene	1.33	0.02	ug/g dry	1.82			31.3	40	
Surrogate: 2-Fluorobiphenyl	*1.49*		*ug/g dry*		*97.6*	*50-140*			
Surrogate: Terphenyl-d14	*1.34*		*ug/g dry*		*87.8*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: Toluene-d8	*8.55*		*ug/g dry*		*93.2*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	199	7	ug/g		99.7	80-120			
F2 PHCs (C10-C16)	79	4	ug/g	ND	90.0	60-140			
F3 PHCs (C16-C34)	220	8	ug/g	18	93.8	60-140			
F4 PHCs (C34-C50)	159	6	ug/g	18	103	60-140			
Metals									
Antimony	39.5		ug/L	ND	78.0	70-130			
Arsenic	49.1		ug/L	1.6	95.0	70-130			
Barium	88.5		ug/L	52.4	72.2	70-130			
Beryllium	46.0		ug/L	ND	91.7	70-130			
Boron	43.1		ug/L	ND	79.3	70-130			
Cadmium	43.0		ug/L	ND	85.8	70-130			
Chromium (VI)	5.0	0.2	ug/g		100	70-130			
Chromium	56.2		ug/L	7.7	97.2	70-130			
Cobalt	46.1		ug/L	ND	90.5	70-130			
Copper	49.2		ug/L	ND	89.0	70-130			
Lead	44.4		ug/L	3.2	82.3	70-130			
Mercury	1.54	0.1	ug/g	ND	102	70-130			
Molybdenum	45.2		ug/L	ND	89.1	70-130			
Nickel	62.8		ug/L	20.2	85.2	70-130			
Selenium	45.0		ug/L	ND	89.4	70-130			
Silver	42.3		ug/L	ND	84.5	70-130			
Thallium	42.6		ug/L	ND	85.1	70-130			
Uranium	44.6		ug/L	ND	87.8	70-130			
Vanadium	57.0		ug/L	ND	95.7	70-130			
Zinc	58.3		ug/L	ND	82.5	70-130			
Semi-Volatiles									
Acenaphthene	0.153	0.02	ug/g	ND	76.7	50-140			
Acenaphthylene	0.144	0.02	ug/g	ND	72.2	50-140			
Anthracene	0.164	0.02	ug/g	ND	82.3	50-140			
Benzo [a] anthracene	0.175	0.02	ug/g	ND	87.5	50-140			
Benzo [a] pyrene	0.152	0.02	ug/g	ND	76.1	50-140			
Benzo [b] fluoranthene	0.256	0.02	ug/g	ND	128	50-140			
Benzo [g,h,i] perylene	0.143	0.02	ug/g	ND	71.7	50-140			
Benzo [k] fluoranthene	0.223	0.02	ug/g	ND	112	50-140			
Chrysene	0.212	0.02	ug/g	ND	106	50-140			
Dibenzo [a,h] anthracene	0.138	0.02	ug/g	ND	69.4	50-140			
Fluoranthene	0.184	0.02	ug/g	0.021	81.7	50-140			
Fluorene	0.163	0.02	ug/g	ND	81.6	50-140			
Indeno [1,2,3-cd] pyrene	0.149	0.02	ug/g	ND	74.8	50-140			
1-Methylnaphthalene	0.185	0.02	ug/g	ND	92.6	50-140			
2-Methylnaphthalene	0.200	0.02	ug/g	ND	100	50-140			
Naphthalene	0.176	0.01	ug/g	ND	88.4	50-140			
Phenanthrene	0.174	0.02	ug/g	ND	87.4	50-140			
Pyrene	0.188	0.02	ug/g	0.020	84.2	50-140			
Surrogate: 2-Fluorobiphenyl	*1.64*		*ug/g*		*103*	*50-140*			
Volatiles									
Benzene	3.60	0.02	ug/g		90.1	60-130			
Ethylbenzene	3.29	0.05	ug/g		82.2	60-130			
Toluene	3.44	0.05	ug/g		85.9	60-130			
m,p-Xylenes	6.97	0.05	ug/g		87.2	60-130			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26411

Report Date: 26-Apr-2019
Order Date: 23-Apr-2019
Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
o-Xylene	3.52	0.05	ug/g		87.9	60-130			

Qualifier Notes:

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

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Paracel ID: 1917260

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Chain of Custody
(Lab Use Only)
№ 121668

Page 1 of 1

Client Name: PATERSON	Project Reference: PE4597
Contact Name: MIKE BEAUDOIN	Quote #
Address: 154 Colonnade Rd S.	PO # 26411
Telephone: 613-226-7381	Email Address: mbeaudoin@patersongroup.ca

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

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

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

Required Analyses

Paracel Order Number: 1917260

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	BH1-SS3	S		2	Apr 22/19		X											120ml+1L		
2	BH2-SS2	S		1	Apr 22/19				X	X	X	X						250ml		
3	BH3-SS2	S		1	Apr 22/19					X	X	X						↓		
4	BH4-SS3	S		#1	Apr 22/19				X	X	X	X						↓		
5	BH5-SS2	~~S~~		1	Apr 22/19					X	X	X						120ml		
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A. Jeouse	Received at Lab: Summerside DOWN	Verified By:
Relinquished By (Print): MIKE B.	Date/Time: 23/04/19 3:50 PM	Date/Time: Apr 23 2019 05:00	Date/Time: 04-23-19 17:36
Date/Time:	Temperature: °C	Temperature: 19.6 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 26801
Project: PE4597
Custody: 122409

Report Date: 26-Jun-2019
Order Date: 20-Jun-2019

Order #: 1925512

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

Paracel ID	Client ID
1925512-01	BH6-SS3
1925512-02	BH7-SS3
1925512-03	BH9-SS2
1925512-04	BH10-SS2
1925512-05	BH12-SS2
1925512-06	BH13-SS3
1925512-07	BH14-SS2
1925512-08	BH15-SS2
1925512-09	BH16-SS2
1925512-10	BH17-SS2

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26801

Report Date: 26-Jun-2019
Order Date: 20-Jun-2019
Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 7471B - CVAA, digestion	24-Jun-19	25-Jun-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	24-Jun-19	25-Jun-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	24-Jun-19	25-Jun-19
Solids, %	Gravimetric, calculation	24-Jun-19	24-Jun-19

PARACEL LABORATORIES LTD.

Order #: 1925512

Certificate of Analysis

Report Date: 26-Jun-2019

Client: Paterson Group Consulting Engineers

Order Date: 20-Jun-2019

Client PO: 26801

Project Description: PE4597

	Client ID:	BH6-SS3	BH7-SS3	BH9-SS2	BH10-SS2
	Sample Date:	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00
	Sample ID:	1925512-01	1925512-02	1925512-03	1925512-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	70.8	51.1	74.9	85.5
Metals					
Antimony	1.0 ug/g dry	11.2	55.6	76.5	7.6
Arsenic	1.0 ug/g dry	28.6	28.7	20.0	16.2
Barium	1.0 ug/g dry	1070	1420	1010	957
Beryllium	0.5 ug/g dry	0.7	3.1	0.9	0.7
Boron	5.0 ug/g dry	13.2	51.0	7.4	13.6
Cadmium	0.5 ug/g dry	2.9	2.6	1.5	1.8
Chromium	5.0 ug/g dry	158	57.3	37.3	55.5
Cobalt	1.0 ug/g dry	9.8	36.0	10.7	14.2
Copper	5.0 ug/g dry	161	284	188	129
Lead	1.0 ug/g dry	1420	5290	1010	957
Mercury	0.1 ug/g dry	5.2	10.6	1.1	0.7
Molybdenum	1.0 ug/g dry	7.4	9.4	3.4	6.1
Nickel	5.0 ug/g dry	36.3	88.3	34.4	47.2
Selenium	1.0 ug/g dry	2.9	3.4	1.7	4.8
Silver	0.3 ug/g dry	1.4	1.0	0.8	0.8
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	5.9	<1.0	1.8
Vanadium	10.0 ug/g dry	26.5	66.8	30.4	31.3
Zinc	20.0 ug/g dry	1340	1100	983	699
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.07	0.03	0.05	0.05
Acenaphthylene	0.02 ug/g dry	0.25	0.06	0.47	0.17
Anthracene	0.02 ug/g dry	0.36	0.09	0.31	0.28
Benzo [a] anthracene	0.02 ug/g dry	1.16	0.23	1.46	0.83
Benzo [a] pyrene	0.02 ug/g dry	0.95	0.22	1.56	0.68
Benzo [b] fluoranthene	0.02 ug/g dry	1.35	0.31	1.72	0.92
Benzo [g,h,i] perylene	0.02 ug/g dry	0.65	0.16	0.81	0.40
Benzo [k] fluoranthene	0.02 ug/g dry	0.86	0.16	1.01	0.44
Chrysene	0.02 ug/g dry	1.31	0.31	1.62	0.95
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.16	0.04	0.25	0.11
Fluoranthene	0.02 ug/g dry	2.06	0.46	1.64	1.57
Fluorene	0.02 ug/g dry	0.09	<0.02	0.04	0.06
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.58	0.14	0.79	0.38

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26801

Report Date: 26-Jun-2019

Order Date: 20-Jun-2019

Project Description: PE4597

	Client ID:	BH6-SS3	BH7-SS3	BH9-SS2	BH10-SS2
	Sample Date:	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00
	Sample ID:	1925512-01	1925512-02	1925512-03	1925512-04
	MDL/Units	Soil	Soil	Soil	Soil
1-Methylnaphthalene	0.02 ug/g dry	0.04	<0.02	<0.02	0.02
2-Methylnaphthalene	0.02 ug/g dry	0.06	<0.02	0.04	0.03
Methylnaphthalene (1&2)	0.04 ug/g dry	0.10	<0.04	0.06	0.05
Naphthalene	0.01 ug/g dry	0.12	0.04	0.09	0.03
Phenanthrene	0.02 ug/g dry	0.93	0.25	0.61	0.80
Pyrene	0.02 ug/g dry	1.84	0.40	1.56	1.36
2-Fluorobiphenyl	Surrogate	90.3%	84.9%	101%	112%
Terphenyl-d14	Surrogate	97.4%	86.2%	107%	116%

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26801

Report Date: 26-Jun-2019

Order Date: 20-Jun-2019

Project Description: PE4597

	Client ID:	BH12-SS2	BH13-SS3	BH14-SS2	BH15-SS2
	Sample Date:	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00
	Sample ID:	1925512-05	1925512-06	1925512-07	1925512-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	66.4	63.8	80.6	90.8
Metals					
Antimony	1.0 ug/g dry	21.1	23.7	9.6	<1.0
Arsenic	1.0 ug/g dry	40.2	112	275	6.5
Barium	1.0 ug/g dry	528	1100	1020	74.9
Beryllium	0.5 ug/g dry	1.2	1.5	1.4	0.6
Boron	5.0 ug/g dry	67.3	34.3	15.3	11.0
Cadmium	0.5 ug/g dry	3.4	3.2	2.0	<0.5
Chromium	5.0 ug/g dry	52.6	77.8	41.9	18.0
Cobalt	1.0 ug/g dry	39.1	18.2	13.3	9.2
Copper	5.0 ug/g dry	957	627	172	25.9
Lead	1.0 ug/g dry	907	4230	1150	17.9
Mercury	0.1 ug/g dry	0.7	1.9	1.3	<0.1
Molybdenum	1.0 ug/g dry	6.3	8.0	16.9	3.1
Nickel	5.0 ug/g dry	72.9	51.8	72.4	30.8
Selenium	1.0 ug/g dry	4.8	25.5	31.3	<1.0
Silver	0.3 ug/g dry	1.0	2.4	1.1	<0.3
Thallium	1.0 ug/g dry	<1.0	1.2	2.8	<1.0
Uranium	1.0 ug/g dry	1.6	<1.0	<1.0	1.5
Vanadium	10.0 ug/g dry	32.1	38.4	33.6	28.9
Zinc	20.0 ug/g dry	1960	1580	563	36.4
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	0.53	0.57	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	0.16	6.86	<0.02
Anthracene	0.02 ug/g dry	<0.02	1.73	5.69	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.04	3.38	13.0	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.04	2.34	12.6	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.05	3.45	15.3	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.02	1.50	6.33	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.02	1.68	7.88	<0.02
Chrysene	0.02 ug/g dry	0.05	3.74	11.0	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	0.41	2.08	<0.02
Fluoranthene	0.02 ug/g dry	0.09	6.56	20.0	<0.02
Fluorene	0.02 ug/g dry	<0.02	0.72	0.99	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.02	1.27	6.41	<0.02

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26801

Report Date: 26-Jun-2019

Order Date: 20-Jun-2019

Project Description: PE4597

	Client ID:	BH12-SS2	BH13-SS3	BH14-SS2	BH15-SS2
	Sample Date:	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00	19-Jun-19 09:00
	Sample ID:	1925512-05	1925512-06	1925512-07	1925512-08
	MDL/Units	Soil	Soil	Soil	Soil
1-Methylnaphthalene	0.02 ug/g dry	<0.02	0.08	<0.40 [1]	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	0.13	<0.40 [1]	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	0.21	<0.80 [1]	<0.04
Naphthalene	0.01 ug/g dry	0.01	0.17	0.24	<0.01
Phenanthrene	0.02 ug/g dry	0.06	5.77	8.63	<0.02
Pyrene	0.02 ug/g dry	0.08	4.90	19.5	<0.02
2-Fluorobiphenyl	Surrogate	85.4%	86.8%	109%	97.4%
Terphenyl-d14	Surrogate	96.2%	89.7%	109%	105%

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26801

Report Date: 26-Jun-2019

Order Date: 20-Jun-2019

Project Description: PE4597

	Client ID:	BH16-SS2	BH17-SS2	-	-
	Sample Date:	19-Jun-19 09:00	19-Jun-19 09:00	-	-
	Sample ID:	1925512-09	1925512-10	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	73.9	79.3	-	-
Metals					
Antimony	1.0 ug/g dry	52.4	7.4	-	-
Arsenic	1.0 ug/g dry	60.5	15.6	-	-
Barium	1.0 ug/g dry	3000	1710	-	-
Beryllium	0.5 ug/g dry	1.5	0.8	-	-
Boron	5.0 ug/g dry	24.5	10.7	-	-
Cadmium	0.5 ug/g dry	3.0	1.0	-	-
Chromium	5.0 ug/g dry	61.3	69.2	-	-
Cobalt	1.0 ug/g dry	16.7	11.0	-	-
Copper	5.0 ug/g dry	290	178	-	-
Lead	1.0 ug/g dry	5660	1520	-	-
Mercury	0.1 ug/g dry	1.3	0.6	-	-
Molybdenum	1.0 ug/g dry	8.3	3.0	-	-
Nickel	5.0 ug/g dry	53.7	36.7	-	-
Selenium	1.0 ug/g dry	10.5	2.5	-	-
Silver	0.3 ug/g dry	2.8	1.9	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	10.0 ug/g dry	40.0	34.3	-	-
Zinc	20.0 ug/g dry	1540	833	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.06	4.33	-	-
Acenaphthylene	0.02 ug/g dry	0.21	2.40	-	-
Anthracene	0.02 ug/g dry	0.52	12.2	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.98	30.8	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.81	24.2	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	1.36	33.4	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.75	13.6	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.71	14.9	-	-
Chrysene	0.02 ug/g dry	1.21	35.2	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.16	3.77	-	-
Fluoranthene	0.02 ug/g dry	1.62	72.9	-	-
Fluorene	0.02 ug/g dry	0.06	3.90	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.66	12.9	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26801

Report Date: 26-Jun-2019

Order Date: 20-Jun-2019

Project Description: PE4597

	Client ID:	BH16-SS2	BH17-SS2	-	-
	Sample Date:	19-Jun-19 09:00	19-Jun-19 09:00	-	-
	Sample ID:	1925512-09	1925512-10	-	-
	MDL/Units	Soil	Soil	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.02	0.89	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.08	0.98	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.10	1.87	-	-
Naphthalene	0.01 ug/g dry	0.06	1.70	-	-
Phenanthrene	0.02 ug/g dry	0.77	50.9	-	-
Pyrene	0.02 ug/g dry	1.54	57.7	-	-
2-Fluorobiphenyl	Surrogate	106%	102%	-	-
Terphenyl-d14	Surrogate	108%	103%	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26801

Report Date: 26-Jun-2019
Order Date: 20-Jun-2019
Project Description: PE4597

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*0.906*		*ug/g*		*68.0*	*50-140*			
Surrogate: Terphenyl-d14	*0.942*		*ug/g*		*70.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	0.309	0.1	ug/g dry	0.337			8.6	30	
Physical Characteristics									
% Solids	70.8	0.1	% by Wt.	70.8			0.1	25	
Semi-Volatiles									
Acenaphthene	0.468	0.02	ug/g dry	0.070			148.0	40	QR-04
Acenaphthylene	0.342	0.02	ug/g dry	0.249			31.3	40	QR-04
Anthracene	1.49	0.02	ug/g dry	0.360			122.0	40	QR-04
Benzo [a] anthracene	3.26	0.02	ug/g dry	1.16			95.2	40	QR-04
Benzo [a] pyrene	2.46	0.02	ug/g dry	0.954			88.2	40	QR-04
Benzo [b] fluoranthene	3.24	0.02	ug/g dry	1.35			82.5	40	QR-04
Benzo [g,h,i] perylene	1.40	0.02	ug/g dry	0.646			73.5	40	QR-04
Benzo [k] fluoranthene	1.61	0.02	ug/g dry	0.859			61.0	40	QR-04
Chrysene	3.49	0.02	ug/g dry	1.31			91.1	40	QR-04
Dibenzo [a,h] anthracene	0.349	0.02	ug/g dry	0.156			76.4	40	QR-04
Fluoranthene	7.10	0.02	ug/g dry	2.06			110.0	40	QR-04
Fluorene	0.472	0.02	ug/g dry	0.088			137.0	40	QR-04
Indeno [1,2,3-cd] pyrene	1.28	0.02	ug/g dry	0.576			75.5	40	QR-04
1-Methylnaphthalene	0.087	0.02	ug/g dry	0.040			74.4	40	QR-04
2-Methylnaphthalene	0.134	0.02	ug/g dry	0.059			77.2	40	QR-04
Naphthalene	0.293	0.01	ug/g dry	0.119			84.5	40	QR-04
Phenanthrene	5.27	0.02	ug/g dry	0.934			140.0	40	QR-04
Pyrene	6.19	0.02	ug/g dry	1.84			108.0	40	QR-04
Surrogate: 2-Fluorobiphenyl	*1.85*		*ug/g dry*		*98.1*	*50-140*			
Surrogate: Terphenyl-d14	*1.94*		*ug/g dry*		*103*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26801

Report Date: 26-Jun-2019
Order Date: 20-Jun-2019
Project Description: PE4597

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	38.0		ug/L		76.0	70-130			
Arsenic	48.7		ug/L		97.5	70-130			
Barium	47.1		ug/L		94.2	70-130			
Beryllium	48.7		ug/L		97.5	70-130			
Boron	43.8		ug/L		87.6	70-130			
Cadmium	48.5		ug/L		97.0	70-130			
Chromium	49.0		ug/L		98.0	70-130			
Cobalt	49.0		ug/L		97.9	70-130			
Copper	47.7		ug/L		95.5	70-130			
Lead	49.5		ug/L		99.0	70-130			
Mercury	1.83	0.1	ug/g	0.337	99.3	70-130			
Molybdenum	48.2		ug/L		96.3	70-130			
Nickel	48.4		ug/L		96.8	70-130			
Selenium	49.9		ug/L		99.8	70-130			
Silver	46.8		ug/L		93.5	70-130			
Thallium	47.1		ug/L		94.2	70-130			
Uranium	47.2		ug/L		94.4	70-130			
Vanadium	48.5		ug/L		96.9	70-130			
Zinc	49.7		ug/L		99.4	70-130			
Semi-Volatiles									
Acenaphthene	0.144	0.02	ug/g		86.2	50-140			
Acenaphthylene	0.131	0.02	ug/g		78.5	50-140			
Anthracene	0.130	0.02	ug/g		78.2	50-140			
Benzo [a] anthracene	0.129	0.02	ug/g		77.7	50-140			
Benzo [a] pyrene	0.109	0.02	ug/g		65.1	50-140			
Benzo [b] fluoranthene	0.174	0.02	ug/g		104	50-140			
Benzo [g,h,i] perylene	0.113	0.02	ug/g		68.0	50-140			
Benzo [k] fluoranthene	0.133	0.02	ug/g		79.7	50-140			
Chrysene	0.150	0.02	ug/g		90.1	50-140			
Dibenzo [a,h] anthracene	0.111	0.02	ug/g		66.9	50-140			
Fluoranthene	0.135	0.02	ug/g		81.3	50-140			
Fluorene	0.139	0.02	ug/g		83.5	50-140			
Indeno [1,2,3-cd] pyrene	0.116	0.02	ug/g		69.4	50-140			
1-Methylnaphthalene	0.152	0.02	ug/g		91.4	50-140			
2-Methylnaphthalene	0.168	0.02	ug/g		101	50-140			
Naphthalene	0.143	0.01	ug/g		85.9	50-140			
Phenanthrene	0.137	0.02	ug/g		82.2	50-140			
Pyrene	0.136	0.02	ug/g		81.6	50-140			
Surrogate: 2-Fluorobiphenyl	*1.37*		*ug/g*		*103*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit due to dilution required because of high target analyte concentration.

QC Qualifiers :

QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

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PARACEL WO: 1925512

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Ottawa, Ontario K1G 4J8
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e: paracel@paracellabs.com

Chain of Custody
(Lab Use Only)
№ 122409

Page 1 of 1

Client Name: Paterson	Project Reference: PE4597	**Turnaround Time:**
Contact Name: Mike Beaudoin	Quote #	☐ 1 Day ☐ 3 Day
Address: 154 Colonnade Rd S.	PO # 26801	☐ 2 Day ☒ Regular
Telephone: 613-226-7381	Email Address: mbeaudoin@patersongroup.ca	Date Required:

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

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

Required Analyses

Paracel Order Number: 1925512

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	BH6-SS3	S		1	June 19/19				X	X	X						250mL			✓
2	BH7-SS3								X	X	X									✓
3	BH9-SS2								X	X	X									✓
4	BH10-SS2								X	X	X									✓
5	BH12-SS2								X	X	X									✓
6	BH13-SS3								X	X	X									✓
7	BH14-SS2								X	X	X									✓
8	BH15-SS2								X	X	X									✓
9	BH16-SS2								X	X	X									✓
10	BH17-SS2								X	X	X									✓

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: T Teodie	Received at Lab: Shreeparn Bahmai	Verified By: DGauvin
Relinquished By (Print):	Date/Time: 20/06/19 3:10 PM	Date/Time: June 20, 2019 09:28	Date/Time: 21 June 2019 10:10
Date/Time:	Temperature: °C	Temperature: 20.8	pH Verified ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 33473
Project: PE4597
Custody:

Report Date: 9-Dec-2021
Order Date: 3-Dec-2021

Order #: 2149588

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

Paracel ID	Client ID
2149588-01	TP1-21-02
2149588-02	TP2-21-02
2149588-03	TP3-21-02
2149588-04	TP4-21-02
2149588-05	TP5-21-02
2149588-06	TP8-21-02
2149588-07	TP9-21-02
2149588-08	TP10-21-02
2149588-09	TP11-21-02
2149588-10	TP13-21-02
2149588-11	TP14-21-02
2149588-12	TP15-21-02
2149588-13	TP6-21-01

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 33473

Report Date: 09-Dec-2021

Order Date: 3-Dec-2021

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	7-Dec-21	7-Dec-21
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	6-Dec-21	7-Dec-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	8-Dec-21	9-Dec-21
PHC F1	CWS Tier 1 - P&T GC-FID	7-Dec-21	7-Dec-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	6-Dec-21	8-Dec-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	8-Dec-21	9-Dec-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	6-Dec-21	7-Dec-21
Solids, %	Gravimetric, calculation	8-Dec-21	9-Dec-21

Certificate of Analysis

Report Date: 09-Dec-2021

Client: Paterson Group Consulting Engineers

Order Date: 3-Dec-2021

Client PO: 33473

Project Description: PE4597

	Client ID:	TP1-21-02	TP2-21-02	TP3-21-02	TP4-21-02
	Sample Date:	02-Dec-21 14:00	02-Dec-21 14:05	02-Dec-21 14:10	02-Dec-21 14:15
	Sample ID:	2149588-01	2149588-02	2149588-03	2149588-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.6	86.0	92.5	90.4
Metals					
Antimony	1.0 ug/g dry	2.8	1.4	<1.0	<1.0
Arsenic	1.0 ug/g dry	3.6	3.5	4.9	5.6
Barium	1.0 ug/g dry	77.5	87.5	74.6	97.5
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	0.5
Boron	5.0 ug/g dry	5.1	<5.0	7.8	7.9
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	32.2	26.3	13.6	18.4
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	6.2	7.5	8.1	8.0
Copper	5.0 ug/g dry	23.3	17.4	20.5	22.5
Lead	1.0 ug/g dry	66.9	22.7	8.8	10.9
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	1.1	3.6	2.5
Nickel	5.0 ug/g dry	18.1	20.3	27.0	26.6
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	1.2	2.4	1.4	1.6
Vanadium	10.0 ug/g dry	59.7	45.5	22.1	29.0
Zinc	20.0 ug/g dry	70.3	58.0	29.6	35.4
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	90.1%	87.7%	84.4%	84.9%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	19	45	45
F3 PHCs (C16-C34)	8 ug/g dry	<8	27	65	51
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Certificate of Analysis

Report Date: 09-Dec-2021

Client: Paterson Group Consulting Engineers

Order Date: 3-Dec-2021

Client PO: 33473

Project Description: PE4597

	Client ID:	TP1-21-02	TP2-21-02	TP3-21-02	TP4-21-02
	Sample Date:	02-Dec-21 14:00	02-Dec-21 14:05	02-Dec-21 14:10	02-Dec-21 14:15
	Sample ID:	2149588-01	2149588-02	2149588-03	2149588-04
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.05	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.05	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.06	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.03	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.03	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.08	0.02	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	0.10	0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.02	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	0.04	0.03	0.03	<0.02
Pyrene	0.02 ug/g dry	0.10	0.03	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	62.4%	84.8%	80.7%	93.0%
Terphenyl-d14	Surrogate	91.4%	94.9%	93.1%	107%

Certificate of Analysis

Report Date: 09-Dec-2021

Client: Paterson Group Consulting Engineers

Order Date: 3-Dec-2021

Client PO: 33473

Project Description: PE4597

	Client ID:	TP5-21-02	TP8-21-02	TP9-21-02	TP10-21-02
	Sample Date:	02-Dec-21 14:20	02-Dec-21 14:25	02-Dec-21 14:30	02-Dec-21 14:35
	Sample ID:	2149588-05	2149588-06	2149588-07	2149588-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	75.9	90.7	83.3	80.3
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	3.9	4.1	1.6	2.0
Barium	1.0 ug/g dry	329	77.8	32.8	53.7
Beryllium	0.5 ug/g dry	0.7	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	<5.0	6.0	<5.0	<5.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	112	11.1	16.2	27.3
Chromium (VI)	0.2 ug/g dry	0.4	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	21.4	6.1	4.3	6.9
Copper	5.0 ug/g dry	66.2	39.3	12.2	14.8
Lead	1.0 ug/g dry	42.3	7.2	4.4	5.6
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	2.4	<1.0	<1.0
Nickel	5.0 ug/g dry	63.7	20.3	10.3	17.2
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	1.1	<1.0	<1.0
Vanadium	10.0 ug/g dry	104	17.8	19.0	31.9
Zinc	20.0 ug/g dry	128	23.9	24.5	37.3
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	92.9%	86.1%	89.5%	94.0%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	41	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	51	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Certificate of Analysis

Report Date: 09-Dec-2021

Client: **Paterson Group Consulting Engineers**

Order Date: 3-Dec-2021

Client PO: **33473**

Project Description: PE4597

	Client ID:	TP5-21-02	TP8-21-02	TP9-21-02	TP10-21-02
	Sample Date:	02-Dec-21 14:20	02-Dec-21 14:25	02-Dec-21 14:30	02-Dec-21 14:35
	Sample ID:	2149588-05	2149588-06	2149588-07	2149588-08
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	0.07	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.12	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.14	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.14	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.10	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.08	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.18	<0.02	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.03	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	0.32	<0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	0.03	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.08	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	0.03	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	0.27	<0.02	<0.02	<0.02
Pyrene	0.02 ug/g dry	0.27	<0.02	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	76.4%	86.4%	64.3%	89.4%
Terphenyl-d14	Surrogate	86.2%	103%	91.8%	126%

Certificate of Analysis

Report Date: 09-Dec-2021

Client: Paterson Group Consulting Engineers

Order Date: 3-Dec-2021

Client PO: 33473

Project Description: PE4597

	Client ID:	TP11-21-02	TP13-21-02	TP14-21-02	TP15-21-02
	Sample Date:	02-Dec-21 14:40	02-Dec-21 14:45	02-Dec-21 14:50	02-Dec-21 14:55
	Sample ID:	2149588-09	2149588-10	2149588-11	2149588-12
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	22.4	83.0	55.5	47.5
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.9	1.7	2.1	1.7
Barium	1.0 ug/g dry	78.7	31.1	32.0	72.3
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	23.4	<5.0	<5.0	5.4
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	11.5	15.1	14.3	24.5
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	5.6	3.8	3.6	6.2
Copper	5.0 ug/g dry	28.4	7.5	6.8	13.4
Lead	1.0 ug/g dry	8.3	4.2	6.7	8.8
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	3.1	<1.0	2.7	1.5
Nickel	5.0 ug/g dry	31.4	9.2	9.2	16.5
Selenium	1.0 ug/g dry	3.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	1.2	<1.0	<1.0	1.2
Vanadium	10.0 ug/g dry	12.7	19.4	19.0	28.8
Zinc	20.0 ug/g dry	42.6	<20.0	21.6	40.9
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	108%	90.6%	105%	96.7%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Certificate of Analysis

Report Date: 09-Dec-2021

Client: **Paterson Group Consulting Engineers**

Order Date: 3-Dec-2021

Client PO: **33473**

Project Description: PE4597

	Client ID:	TP11-21-02	TP13-21-02	TP14-21-02	TP15-21-02
	Sample Date:	02-Dec-21 14:40	02-Dec-21 14:45	02-Dec-21 14:50	02-Dec-21 14:55
	Sample ID:	2149588-09	2149588-10	2149588-11	2149588-12
	MDL/Units	Soil	Soil	Soil	Soil
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	79.7%	80.1%	87.9%	81.0%
Terphenyl-d14	Surrogate	88.5%	83.6%	110%	93.2%

Certificate of Analysis

Report Date: 09-Dec-2021

Client: **Paterson Group Consulting Engineers**

Order Date: 3-Dec-2021

Client PO: **33473**

Project Description: PE4597

	Client ID:	TP6-21-01	-	-	-
	Sample Date:	02-Dec-21 15:00	-	-	-
	Sample ID:	2149588-13	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	33.6	-	-	-
Metals					
Antimony	1.0 ug/g dry	4.0	-	-	-
Arsenic	1.0 ug/g dry	7.4	-	-	-
Barium	1.0 ug/g dry	526	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	8.9	-	-	-
Cadmium	0.5 ug/g dry	1.6	-	-	-
Chromium	5.0 ug/g dry	31.8	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	5.7	-	-	-
Copper	5.0 ug/g dry	215	-	-	-
Lead	1.0 ug/g dry	554	-	-	-
Mercury	0.1 ug/g dry	0.5	-	-	-
Molybdenum	1.0 ug/g dry	4.1	-	-	-
Nickel	5.0 ug/g dry	32.7	-	-	-
Selenium	1.0 ug/g dry	8.1	-	-	-
Silver	0.3 ug/g dry	0.5	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	21.3	-	-	-
Vanadium	10.0 ug/g dry	27.4	-	-	-
Zinc	20.0 ug/g dry	612	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	95.4%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Certificate of Analysis

Report Date: 09-Dec-2021

Client: **Paterson Group Consulting Engineers**

Order Date: 3-Dec-2021

Client PO: **33473**

Project Description: PE4597

	Client ID:	TP6-21-01	-	-	-
	Sample Date:	02-Dec-21 15:00	-	-	-
	Sample ID:	2149588-13	-	-	-
	MDL/Units	Soil	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	0.21	-	-	-
Anthracene	0.02 ug/g dry	0.25	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.81	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.73	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.58	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.35	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.35	-	-	-
Chrysene	0.02 ug/g dry	0.59	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.12	-	-	-
Fluoranthene	0.02 ug/g dry	1.01	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.32	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	0.01	-	-	-
Phenanthrene	0.02 ug/g dry	0.40	-	-	-
Pyrene	0.02 ug/g dry	0.82	-	-	-
2-Fluorobiphenyl	Surrogate	86.2%	-	-	-
Terphenyl-d14	Surrogate	92.3%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.08*		*ug/g*		*80.8*	*50-140*			
Surrogate: Terphenyl-d14	*1.47*		*ug/g*		*110*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*6.49*		*ug/g*		*81.1*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Antimony	2.3	1.0	ug/g dry	ND			NC	30	
Arsenic	3.5	1.0	ug/g dry	3.5			2.6	30	
Barium	156	1.0	ug/g dry	162			3.9	30	
Beryllium	0.7	0.5	ug/g dry	0.6			9.8	30	
Boron	10.1	5.0	ug/g dry	8.4			18.7	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g dry	ND			NC	35	
Chromium	27.2	5.0	ug/g dry	26.9			1.3	30	
Cobalt	8.4	1.0	ug/g dry	8.5			1.7	30	
Copper	19.6	5.0	ug/g dry	20.3			3.3	30	
Lead	46.3	1.0	ug/g dry	46.0			0.6	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	17.2	5.0	ug/g dry	17.5			1.9	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	34.7	10.0	ug/g dry	35.1			1.0	30	
Zinc	171	20.0	ug/g dry	173			1.1	30	
Physical Characteristics									
% Solids	84.5	0.1	% by Wt.	82.2			2.8	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Chrysene	ND	0.02	ug/g dry	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	ND	0.02	ug/g dry	ND			NC	40	
Pyrene	ND	0.02	ug/g dry	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*1.04*		*ug/g dry*		*69.7*	*50-140*			
Surrogate: Terphenyl-d14	*1.38*		*ug/g dry*		*92.5*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*6.42*		*ug/g dry*		*80.3*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	175	7	ug/g	ND	87.3	80-120			
F2 PHCs (C10-C16)	87	4	ug/g	ND	93.5	60-140			
F3 PHCs (C16-C34)	236	8	ug/g	ND	103	60-140			
F4 PHCs (C34-C50)	180	6	ug/g	ND	124	60-140			
Metals									
Antimony	49.2	1.0	ug/g	ND	98.1	70-130			
Arsenic	55.7	1.0	ug/g	1.4	109	70-130			
Barium	121	1.0	ug/g	64.9	112	70-130			
Beryllium	51.8	0.5	ug/g	ND	103	70-130			
Boron	53.9	5.0	ug/g	ND	101	70-130			
Cadmium	50.0	0.5	ug/g	ND	99.7	70-130			
Chromium (VI)	0.2	0.2	ug/g	ND	77.0	70-130			
Chromium	65.4	5.0	ug/g	10.7	109	70-130			
Cobalt	57.2	1.0	ug/g	3.4	108	70-130			
Copper	59.6	5.0	ug/g	8.1	103	70-130			
Lead	70.1	1.0	ug/g	18.4	103	70-130			
Mercury	1.37	0.1	ug/g	ND	91.0	70-130			
Molybdenum	52.4	1.0	ug/g	ND	104	70-130			
Nickel	58.7	5.0	ug/g	7.0	103	70-130			
Selenium	52.7	1.0	ug/g	ND	105	70-130			
Silver	44.8	0.3	ug/g	ND	89.5	70-130			
Thallium	51.5	1.0	ug/g	ND	103	70-130			
Uranium	53.5	1.0	ug/g	ND	106	70-130			
Vanadium	69.4	10.0	ug/g	14.0	111	70-130			
Zinc	122	20.0	ug/g	69.1	106	70-130			
Semi-Volatiles									
Acenaphthene	0.161	0.02	ug/g	ND	86.4	50-140			
Acenaphthylene	0.125	0.02	ug/g	ND	67.1	50-140			
Anthracene	0.137	0.02	ug/g	ND	73.3	50-140			
Benzo [a] anthracene	0.111	0.02	ug/g	ND	59.3	50-140			
Benzo [a] pyrene	0.159	0.02	ug/g	ND	85.0	50-140			
Benzo [b] fluoranthene	0.171	0.02	ug/g	ND	91.3	50-140			
Benzo [g,h,i] perylene	0.179	0.02	ug/g	ND	96.0	50-140			
Benzo [k] fluoranthene	0.159	0.02	ug/g	ND	85.4	50-140			
Chrysene	0.168	0.02	ug/g	ND	89.9	50-140			
Dibenzo [a,h] anthracene	0.144	0.02	ug/g	ND	77.4	50-140			
Fluoranthene	0.140	0.02	ug/g	ND	75.2	50-140			
Fluorene	0.169	0.02	ug/g	ND	90.4	50-140			
Indeno [1,2,3-cd] pyrene	0.149	0.02	ug/g	ND	79.6	50-140			
1-Methylnaphthalene	0.242	0.02	ug/g	ND	130	50-140			
2-Methylnaphthalene	0.203	0.02	ug/g	ND	108	50-140			
Naphthalene	0.183	0.01	ug/g	ND	98.0	50-140			
Phenanthrene	0.156	0.02	ug/g	ND	83.6	50-140			
Pyrene	0.133	0.02	ug/g	ND	71.3	50-140			
Surrogate: 2-Fluorobiphenyl	*1.29*		*ug/g*		*86.2*	*50-140*			
Surrogate: Terphenyl-d14	*1.50*		*ug/g*		*101*	*50-140*			
Volatiles									
Benzene	3.28	0.02	ug/g	ND	82.0	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylbenzene	3.91	0.05	ug/g	ND	97.7	60-130			
Toluene	3.59	0.05	ug/g	ND	89.9	60-130			
m,p-Xylenes	7.57	0.05	ug/g	ND	94.6	60-130			
o-Xylene	3.61	0.05	ug/g	ND	90.3	60-130			
Surrogate: Toluene-d8	*5.40*		*ug/g*		*67.6*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 2149588

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2149588	

Client Name: Paterson	Project Ref: PE4597	Page 1 of 2
Contact Name: Michael Beaudoin	Quote #:	
Address: 154 Colonnade Rd.	PO #: 33473	Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-866-4875	E-mail: MBeaudoin@PatersonGroup.ca BDrieschner@ "	Date Required:

☒ REG 153/04 ☐ REG 406/19

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

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

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Required Analysis
1	TP1-21-02	S		2	Dec 2 2021	1400	X		X	X	X	X		
2	TP2-21-02	S		2	"	1405	X		X	X	X	X		
3	TP3-21-02	S		2	"	1410	X		X	X	X	X		
4	TP4-21-02	S		2	"	1415	X		X	X	X	X		
5	TP5-21-02	S		2	"	1420	X		X	X	X	X		
6	TP8-21-02	S		2	"	1425	X		X	X	X	X		
7	TP9-21-02	S		2	"	1430	X		X	X	X	X		
8	TP10-21-02	S		2	"	1435	X		X	X	X	X		
9	TP11-21-02	S		2	"	1440	X		X	X	X	X		
10	TP13-21-02	S		3	"	1445	X		X	X	X	X		

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): BDrieschner	Received By Driver/Depot: M. LOUISE	Received at Lab: Shreeparn Rahmani	Verified By: CR
Relinquished By (Print): Beau Drieschner	Date/Time: 03/12/21 4:20	Date/Time: Dec 03, 2021 04.55	Date/Time: Dec 3 2021 5:20
Date/Time: Dec 2 2021 (1825)	Temperature: °C	Temperature: 6.2 C	pH Verified: ☐ By:

PARACEL LABORATORIES LTD

Paracel ID: 2149588

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2149588	

Client Name: Paterson
Contact Name: Michael Beaudoin
Address: 154 Colonnade Rd
Telephone: 613-866-4875

Project Ref: PE 4597
Quote #:
PO #: 33473
E-mail: Mbeaudoin@Patersongroup.ca
Bdrieschner@Patersongroup.ca

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

☒ REG 153/04 ☐ REG 406/19

Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☒ Table 3 ☐ Agri/Other
☐ Table
For RSC: ☐ Yes ☐ No
☐ REG 558 ☐ PWQO
☐ CCME ☐ MISA
☐ SU - Sani ☐ SU - Storm
Mun:
☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	TP14-21-02	S		3	Dec 2 2021	1450	X		X	X	X	X	
2	TP15-21-02	S		3	"	1455	X		X	X	X	X	
3	TP6-21-01	S		3	"	1500	X		X	X	X	X	
4													
5													
6													
7													
8													
9													
10													

Required Analysis

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Beau Drieschner	Date/Time: 03/12/21 4:20	Date/Time: Dec 03, 2021 04:55	Date/Time: Dec 3 2021 5:18
Date/Time: Dec 2 2021 (1830)	Temperature: °C	Temperature: 6.2C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 31228
Project: PE4597
Custody: 55598

Report Date: 24-Dec-2020
Order Date: 21-Dec-2020

Order #: 2052121

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

Paracel ID	Client ID
2052121-01	TP1-G2
2052121-02	TP2-G2
2052121-03	TP3-G2
2052121-04	TP4-G2
2052121-05	TP5-G2
2052121-06	TP6-G1
2052121-07	TP7-G3
2052121-08	TP8-G2
2052121-09	Dup

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 24-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Dec-2020

Client PO: 31228

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	23-Dec-20	23-Dec-20
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	21-Dec-20	23-Dec-20
Solids, %	Gravimetric, calculation	21-Dec-20	22-Dec-20

Certificate of Analysis

Report Date: 24-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Dec-2020

Client PO: 31228

Project Description: PE4597

	Client ID:	TP1-G2	TP2-G2	TP3-G2	TP4-G2
	Sample Date:	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00
	Sample ID:	2052121-01	2052121-02	2052121-03	2052121-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	62.2	33.0	56.1	60.0
Metals					
Antimony	1.0 ug/g dry	20.5	2.7	45.6	15.0
Arsenic	1.0 ug/g dry	45.6	6.0	76.8	13.9
Barium	1.0 ug/g dry	1150	255	1540	449
Beryllium	0.5 ug/g dry	0.8	0.7	0.9	<0.5
Boron	5.0 ug/g dry	8.9	9.0	23.6	6.6
Cadmium	0.5 ug/g dry	4.0	1.8	7.2	1.2
Chromium	5.0 ug/g dry	75.6	25.8	105	73.5
Cobalt	1.0 ug/g dry	14.4	6.8	21.5	8.3
Copper	5.0 ug/g dry	401	107	640	152
Lead	1.0 ug/g dry	2250	87.2	2180	1390
Molybdenum	1.0 ug/g dry	4.4	2.6	7.0	2.2
Nickel	5.0 ug/g dry	57.6	27.6	143	36.0
Selenium	1.0 ug/g dry	3.5	6.1	8.8	1.1
Silver	0.3 ug/g dry	2.1	0.4	3.3	1.1
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	1.1	14.6	1.1	1.6
Vanadium	10.0 ug/g dry	27.8	26.7	27.1	21.7
Zinc	20.0 ug/g dry	1820	290	7150	1050
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.22	0.03	0.20	0.58
Acenaphthylene	0.02 ug/g dry	0.36	0.03	0.12	1.36
Anthracene	0.02 ug/g dry	0.99	<0.02	0.63	3.11
Benzo [a] anthracene	0.02 ug/g dry	3.04	0.06	1.67	5.92
Benzo [a] pyrene	0.02 ug/g dry	3.08	0.05	1.45	5.29
Benzo [b] fluoranthene	0.02 ug/g dry	3.16	0.03	1.59	5.71
Benzo [g,h,i] perylene	0.02 ug/g dry	1.62	0.02	0.76	2.93
Benzo [k] fluoranthene	0.02 ug/g dry	1.78	0.03	0.87	3.18
Chrysene	0.02 ug/g dry	3.09	0.04	1.72	4.28
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.47	<0.02	0.24	0.90
Fluoranthene	0.02 ug/g dry	6.57	0.08	3.64	13.9
Fluorene	0.02 ug/g dry	0.26	<0.02	0.20	0.93
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	1.52	0.03	0.74	2.87
1-Methylnaphthalene	0.02 ug/g dry	0.05	<0.02	0.08	0.13

Certificate of Analysis

Report Date: 24-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Dec-2020

Client PO: 31228

Project Description: PE4597

	Client ID:	TP1-G2	TP2-G2	TP3-G2	TP4-G2
	Sample Date:	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00
	Sample ID:	2052121-01	2052121-02	2052121-03	2052121-04
	MDL/Units	Soil	Soil	Soil	Soil
2-Methylnaphthalene	0.02 ug/g dry	0.05	<0.02	0.11	0.16
Methylnaphthalene (1&2)	0.04 ug/g dry	0.10	<0.04	0.18	0.28
Naphthalene	0.01 ug/g dry	0.08	<0.01	0.22	0.26
Phenanthrene	0.02 ug/g dry	3.48	0.03	2.64	9.48
Pyrene	0.02 ug/g dry	5.55	0.07	2.94	11.2
2-Fluorobiphenyl	Surrogate	83.9%	83.3%	104%	85.0%
Terphenyl-d14	Surrogate	94.4%	85.2%	119%	88.3%

Certificate of Analysis

Report Date: 24-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Dec-2020

Client PO: 31228

Project Description: PE4597

	Client ID:	TP5-G2	TP6-G1	TP7-G3	TP8-G2
	Sample Date:	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00
	Sample ID:	2052121-05	2052121-06	2052121-07	2052121-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	62.2	78.0	21.6	86.6
Metals					
Antimony	1.0 ug/g dry	21.5	26.6	<1.0	1.7
Arsenic	1.0 ug/g dry	24.7	24.0	4.5	6.7
Barium	1.0 ug/g dry	753	957	94.3	232
Beryllium	0.5 ug/g dry	0.6	0.8	<0.5	0.5
Boron	5.0 ug/g dry	5.3	9.3	20.0	<5.0
Cadmium	0.5 ug/g dry	2.5	2.0	0.5	1.1
Chromium	5.0 ug/g dry	52.6	70.3	19.3	21.3
Cobalt	1.0 ug/g dry	9.3	14.1	16.1	7.6
Copper	5.0 ug/g dry	236	713	45.3	56.2
Lead	1.0 ug/g dry	1490	1640	29.1	208
Molybdenum	1.0 ug/g dry	2.1	4.0	20.1	1.5
Nickel	5.0 ug/g dry	37.8	79.3	53.4	21.1
Selenium	1.0 ug/g dry	3.1	4.9	3.5	<1.0
Silver	0.3 ug/g dry	1.3	1.4	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	1.2	1.5	9.1	<1.0
Vanadium	10.0 ug/g dry	26.8	36.5	30.3	26.1
Zinc	20.0 ug/g dry	872	1570	136	892
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.46	0.13	<0.02	0.02
Acenaphthylene	0.02 ug/g dry	0.94	0.35	<0.02	0.02
Anthracene	0.02 ug/g dry	2.52	0.86	<0.02	0.08
Benzo [a] anthracene	0.02 ug/g dry	5.68	1.99	0.03	0.15
Benzo [a] pyrene	0.02 ug/g dry	5.40	1.84	0.03	0.15
Benzo [b] fluoranthene	0.02 ug/g dry	6.35	2.12	0.02	0.17
Benzo [g,h,i] perylene	0.02 ug/g dry	2.97	1.13	0.02	0.10
Benzo [k] fluoranthene	0.02 ug/g dry	3.50	1.20	0.02	0.09
Chrysene	0.02 ug/g dry	5.36	1.94	0.04	0.14
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.94	0.33	<0.02	0.03
Fluoranthene	0.02 ug/g dry	13.0	4.24	0.06	0.35
Fluorene	0.02 ug/g dry	0.51	0.17	<0.02	0.03
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	3.15	1.10	<0.02	0.09
1-Methylnaphthalene	0.02 ug/g dry	0.09	0.03	<0.02	<0.02

Certificate of Analysis

Report Date: 24-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Dec-2020

Client PO: 31228

Project Description: PE4597

	Client ID:	TP5-G2	TP6-G1	TP7-G3	TP8-G2
	Sample Date:	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00	18-Dec-20 09:00
	Sample ID:	2052121-05	2052121-06	2052121-07	2052121-08
	MDL/Units	Soil	Soil	Soil	Soil
2-Methylnaphthalene	0.02 ug/g dry	0.12	0.04	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	0.21	0.07	<0.04	<0.04
Naphthalene	0.01 ug/g dry	0.27	0.04	0.08	0.03
Phenanthrene	0.02 ug/g dry	6.46	1.94	0.06	0.28
Pyrene	0.02 ug/g dry	10.1	3.47	0.06	0.29
2-Fluorobiphenyl	Surrogate	101%	67.0%	61.5%	83.1%
Terphenyl-d14	Surrogate	110%	72.1%	59.2%	94.7%
	Client ID:	Dup	-	-	-
	Sample Date:	18-Dec-20 09:00	-	-	-
	Sample ID:	2052121-09	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	60.3	-	-	-
Metals					
Antimony	1.0 ug/g dry	32.5	-	-	-
Arsenic	1.0 ug/g dry	68.9	-	-	-
Barium	1.0 ug/g dry	1260	-	-	-
Beryllium	0.5 ug/g dry	0.6	-	-	-
Boron	5.0 ug/g dry	16.3	-	-	-
Cadmium	0.5 ug/g dry	6.8	-	-	-
Chromium	5.0 ug/g dry	90.5	-	-	-
Cobalt	1.0 ug/g dry	18.9	-	-	-
Copper	5.0 ug/g dry	654	-	-	-
Lead	1.0 ug/g dry	2540	-	-	-
Molybdenum	1.0 ug/g dry	6.2	-	-	-
Nickel	5.0 ug/g dry	132	-	-	-
Selenium	1.0 ug/g dry	7.7	-	-	-
Silver	0.3 ug/g dry	2.8	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	21.8	-	-	-
Zinc	20.0 ug/g dry	7100	-	-	-

Certificate of Analysis

Report Date: 24-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Dec-2020

Client PO: 31228

Project Description: PE4597

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.08*		*ug/g*		*81.0*	*50-140*			
Surrogate: Terphenyl-d14	*1.37*		*ug/g*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	1.1	1.0	ug/g dry	ND			NC	30	
Arsenic	5.3	1.0	ug/g dry	6.0			12.2	30	
Barium	45.0	1.0	ug/g dry	50.0			10.6	30	
Beryllium	0.7	0.5	ug/g dry	0.7			5.8	30	
Boron	ND	5.0	ug/g dry	ND			NC	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	24.3	5.0	ug/g dry	27.4			12.0	30	
Cobalt	7.4	1.0	ug/g dry	8.6			14.0	30	
Copper	11.5	5.0	ug/g dry	13.2			13.6	30	
Lead	11.9	1.0	ug/g dry	13.0			8.5	30	
Molybdenum	1.8	1.0	ug/g dry	1.8			0.6	30	
Nickel	15.3	5.0	ug/g dry	17.9			15.4	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	32.4	10.0	ug/g dry	36.9			13.0	30	
Zinc	32.4	20.0	ug/g dry	36.5			11.9	30	
Physical Characteristics									
% Solids	77.5	0.1	% by Wt.	76.5			1.4	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	0.036	0.02	ug/g dry	0.050			32.4	40	
Benzo [a] pyrene	0.052	0.02	ug/g dry	0.075			37.2	40	
Benzo [b] fluoranthene	0.055	0.02	ug/g dry	0.083			NC	40	
Benzo [g,h,i] perylene	0.039	0.02	ug/g dry	0.061			NC	40	
Benzo [k] fluoranthene	0.025	0.02	ug/g dry	0.044			NC	40	
Chrysene	0.055	0.02	ug/g dry	0.062			11.7	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	0.074	0.02	ug/g dry	0.089			18.3	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	0.034	0.02	ug/g dry	0.052			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	0.030	0.02	ug/g dry	0.031			1.7	40	
Pyrene	0.071	0.02	ug/g dry	0.088			21.5	40	
Surrogate: 2-Fluorobiphenyl	*1.33*		*ug/g dry*		*76.3*	*50-140*			
Surrogate: Terphenyl-d14	*1.70*		*ug/g dry*		*97.6*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	44.7	1.0	ug/g	ND	89.2	70-130			
Arsenic	49.1	1.0	ug/g	2.4	93.4	70-130			
Barium	63.0	1.0	ug/g	20.0	86.0	70-130			
Beryllium	48.2	0.5	ug/g	ND	95.9	70-130			
Boron	45.8	5.0	ug/g	ND	88.5	70-130			
Cadmium	44.2	0.5	ug/g	ND	88.4	70-130			
Chromium	56.8	5.0	ug/g	11.0	91.7	70-130			
Cobalt	48.0	1.0	ug/g	3.4	89.2	70-130			
Copper	49.3	5.0	ug/g	5.3	88.2	70-130			
Lead	48.3	1.0	ug/g	5.2	86.2	70-130			
Molybdenum	47.3	1.0	ug/g	ND	93.3	70-130			
Nickel	52.6	5.0	ug/g	7.2	90.9	70-130			
Selenium	45.6	1.0	ug/g	ND	90.8	70-130			
Silver	41.3	0.3	ug/g	ND	82.4	70-130			
Thallium	43.7	1.0	ug/g	ND	87.2	70-130			
Uranium	45.6	1.0	ug/g	ND	90.6	70-130			
Vanadium	60.4	10.0	ug/g	14.8	91.2	70-130			
Zinc	57.2	20.0	ug/g	ND	85.1	70-130			
Semi-Volatiles									
Acenaphthene	0.178	0.02	ug/g	ND	81.5	50-140			
Acenaphthylene	0.177	0.02	ug/g	ND	81.2	50-140			
Anthracene	0.187	0.02	ug/g	ND	86.0	50-140			
Benzo [a] anthracene	0.203	0.02	ug/g	0.050	70.3	50-140			
Benzo [a] pyrene	0.242	0.02	ug/g	0.075	76.7	50-140			
Benzo [b] fluoranthene	0.292	0.02	ug/g	0.083	95.6	50-140			
Benzo [g,h,i] perylene	0.220	0.02	ug/g	0.061	73.0	50-140			
Benzo [k] fluoranthene	0.226	0.02	ug/g	0.044	83.2	50-140			
Chrysene	0.264	0.02	ug/g	0.062	92.8	50-140			
Dibenzo [a,h] anthracene	0.172	0.02	ug/g	ND	79.0	50-140			
Fluoranthene	0.275	0.02	ug/g	0.089	85.5	50-140			
Fluorene	0.167	0.02	ug/g	ND	76.8	50-140			
Indeno [1,2,3-cd] pyrene	0.213	0.02	ug/g	0.052	74.1	50-140			
1-Methylnaphthalene	0.184	0.02	ug/g	ND	84.6	50-140			
2-Methylnaphthalene	0.200	0.02	ug/g	ND	91.7	50-140			
Naphthalene	0.205	0.01	ug/g	ND	94.2	50-140			
Phenanthrene	0.194	0.02	ug/g	0.031	75.0	50-140			
Pyrene	0.280	0.02	ug/g	0.088	87.9	50-140			
Surrogate: 2-Fluorobiphenyl	*1.37*		*ug/g*		*78.5*	*50-140*			
Surrogate: Terphenyl-d14	*1.72*		*ug/g*		*98.4*	*50-140*			

Qualifier Notes:

QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

PARACE LABORATORIES L

Paracel ID: 2052121

Blvd. 4J8

s.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2052121	№ 55598

Client Name: PATERSON	Project Ref: PE4597	Page 1 of 1
Contact Name: MIKE BEAUDOIN	Quote #:	Turnaround Time
Address: 154 COLONNADE Rd.S, OTTAWA, ONT.	PO #: 31228	☐ 1 day ☐ 3 day
	E-mail: MBEAUDOIN@PATERSONGROUP.CA	☐ 2 day ☑ Regular
Telephone: (613) 226-7381		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: PAH's	Required Analysis: METALS By ICP
1	TP1-G2	S		1	DEC 18/20		✓	✓
2	TP2-G2			1			✓	✓
3	TP3-G2			1			✓	✓
4	TP4-G2			1			✓	✓
5	TP5-G2			1			✓	✓
6	TP6 ~~-G2~~ G1			1			✓	✓
7	TP7-G3			2			✓	✓
8	TP8-G2			2			✓	✓
9	DUP			1				✓
10								

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: M. DEOUIE	Received at Lab: Sureeparn Bhimai	Verified By:
Relinquished By (Print): DOMINIC LANDRY	Date/Time: 21/12/20 3:32	Date/Time: DEC. 21, 2020 04.55	Date/Time: 12-22-20 8:05
Date/Time: DEC. 21/2020	Temperature: °C PH	Temperature: 8.4	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 31230
Project: PE4597
Custody: 55599

Report Date: 30-Dec-2020
Order Date: 22-Dec-2020

Order #: 2052123

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

Paracel ID	Client ID
2052123-01	TCLP

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 22-Dec-2020

Client PO: 31230

Project Description: PE4597

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	23-Dec-20	23-Dec-20
Flashpoint	ASTM D93 - Pensky-Martens Closed Cup	22-Dec-20	24-Dec-20
Metals, ICP-MS	TCLP EPA 6020 - Digestion - ICP-MS	24-Dec-20	24-Dec-20
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	22-Dec-20	23-Dec-20
PHC F1	CWS Tier 1 - P&T GC-FID	23-Dec-20	23-Dec-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	22-Dec-20	23-Dec-20
REG 558 - Mercury by CVAA	EPA 7470A - Cold Vapour AA	29-Dec-20	29-Dec-20
REG 558 - PAHs	EPA 625 - GC-MS	29-Dec-20	29-Dec-20
Solids, %	Gravimetric, calculation	24-Dec-20	24-Dec-20

Certificate of Analysis

Report Date: 30-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 22-Dec-2020

Client PO: 31230

Project Description: PE4597

	Client ID:	TCLP	-	-	-
	Sample Date:	18-Dec-20 09:00	-	-	-
	Sample ID:	2052123-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	41.4	-	-	-
Flashpoint	°C	>70	-	-	-
EPA 1311 - TCLP Leachate Metals					
Arsenic	0.05 mg/L	<0.05	-	-	-
Barium	0.05 mg/L	0.39	-	-	-
Boron	0.05 mg/L	0.19	-	-	-
Cadmium	0.01 mg/L	<0.01	-	-	-
Chromium	0.05 mg/L	<0.05	-	-	-
Lead	0.05 mg/L	0.10	-	-	-
Mercury	0.005 mg/L	<0.005	-	-	-
Selenium	0.05 mg/L	<0.05	-	-	-
Silver	0.05 mg/L	<0.05	-	-	-
Uranium	0.05 mg/L	<0.05	-	-	-
EPA 1311 - TCLP Leachate Organics					
Benzo [a] pyrene	0.0001 mg/L	<0.0001	-	-	-
Terphenyl-d14	Surrogate	118%	-	-	-
General Inorganics					
pH	0.05 pH Units	6.33	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	109%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Certificate of Analysis

Report Date: 30-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 22-Dec-2020

Client PO: 31230

Project Description: PE4597

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L						
Barium	ND	0.05	mg/L						
Boron	ND	0.05	mg/L						
Cadmium	ND	0.01	mg/L						
Chromium	ND	0.05	mg/L						
Lead	ND	0.05	mg/L						
Mercury	ND	0.005	mg/L						
Selenium	ND	0.05	mg/L						
Silver	ND	0.05	mg/L						
Uranium	ND	0.05	mg/L						
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	ND	0.0001	mg/L						
Surrogate: Terphenyl-d14	*0.22*		*mg/L*		*112*	*37.1-155.6*			
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.51*		*ug/g*		*106*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L	ND			NC	29	
Barium	0.289	0.05	mg/L	0.284			1.6	34	
Boron	0.115	0.05	mg/L	0.112			2.6	33	
Cadmium	ND	0.01	mg/L	ND			NC	33	
Chromium	ND	0.05	mg/L	ND			NC	32	
Lead	0.060	0.05	mg/L	0.060			0.0	32	
Mercury	ND	0.005	mg/L	ND			NC	30	
Selenium	ND	0.05	mg/L	ND			NC	28	
Silver	ND	0.05	mg/L	ND			NC	28	
Uranium	ND	0.05	mg/L	ND			NC	27	
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	ND	0.0001	mg/L	ND			NC	50	
Surrogate: Terphenyl-d14	*0.23*		*mg/L*		*117*	*37.1-155.6*			
General Inorganics									
pH	7.61	0.05	pH Units	7.62			0.1	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	91.4	0.1	% by Wt.	91.7			0.2	25	
Volatiles									
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*9.66*		*ug/g dry*		*107*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Metals									
Arsenic	45.1	0.05	mg/L	0.460	89.3	83-119			
Barium	69.9	0.05	mg/L	28.4	83.0	83-116			QM-07
Boron	54.4	0.05	mg/L	11.2	86.3	71-128			
Cadmium	44.2	0.01	mg/L	ND	88.3	78-119			
Chromium	46.4	0.05	mg/L	0.561	91.6	80-124			
Lead	46.0	0.05	mg/L	5.98	80.1	77-126			
Mercury	0.0348	0.005	mg/L	ND	116	70-130			
Selenium	43.2	0.05	mg/L	ND	86.3	81-125			
Silver	39.2	0.05	mg/L	0.066	78.3	70-128			
Uranium	44.7	0.05	mg/L	0.119	89.2	70-131			
EPA 1311 - TCLP Leachate Organics									
Benzo [a] pyrene	0.0520	0.0001	mg/L	ND	104	39-123			
Surrogate: Terphenyl-d14	*0.23*		*mg/L*		*113*	*37.1-155.6*			
Hydrocarbons									
F1 PHCs (C6-C10)	209	7	ug/g	ND	105	80-120			
F2 PHCs (C10-C16)	80	4	ug/g	ND	91.2	60-140			
F3 PHCs (C16-C34)	242	8	ug/g	ND	112	60-140			
F4 PHCs (C34-C50)	145	6	ug/g	ND	106	60-140			
Volatiles									
Benzene	3.83	0.02	ug/g	ND	95.7	60-130			
Ethylbenzene	3.66	0.05	ug/g	ND	91.5	60-130			
Toluene	3.66	0.05	ug/g	ND	91.4	60-130			
m,p-Xylenes	6.67	0.05	ug/g	ND	83.3	60-130			
o-Xylene	3.27	0.05	ug/g	ND	81.8	60-130			
Surrogate: Toluene-d8	*8.36*		*ug/g*		*105*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Sample - F1/BTEX/VOCs (soil) not submitted according to Reg. 153/04, Amended 2011 - not field preserved

Applies to samples: TCLP

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

PARACEL LABORATORIES

Paracel ID: 2052123

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2052123	No 55599

Client Name: PATERSON	Project Ref: PE4597
Contact Name: MIKE BEAUDOIN	Quote #:
Address: 154 COLONNADE Rd. S. OTTAWA, ONT.	PO #: 31230
Telephone: (613) 226-7381	E-mail: MBEAUDOIN@PATERSONGROUP.CA

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Turnaround Time

☐ 1 day ☐ 3 day
☐ 2 day ☑ Regular
Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☑ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: METALS IN LEACHATE	PAH's IN LEACHATE	PHC's (BTEX (BULK))	FLASHPOINT	PH.
1	TCLP	S	/	1	DEC 18/20	/	✓	✓	✓	✓	✓
2											
3											
4											
5											
6											
7											
8											
9											
10											

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: M. DEROUSE	Received at Lab: Dineepan Dahmai	Verified By:
Relinquished By (Print): DOMINIC LANDRY	Date/Time: 21/12/20 3:32	Date/Time: DEC 21, 2020 04:55	Date/Time: 12-22-20 8:17
Date/Time: DEC 21/2020	Temperature: °C PM	Temperature: 8.4 °C	pH Verified: ☐ By: