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Phase II Environmental Site Assessment

208-212 Slater Street
Ottawa, Ontario

Prepared For

Broccolini

May 15, 2019

Report: PE4362-2

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for 208-212 Slater Street, in the City of Ottawa, Ontario. The purpose of the Phase II-ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I-ESA and considered to result in areas of potential environmental concern (APECs) on the Phase II-ESA property. The subsurface investigation consisted of drilling 3 boreholes, all of which were constructed with groundwater monitoring wells.

Soil

Soil samples were obtained from the boreholes and screened using visual observations and organic vapour measurements. Three soil samples were submitted for laboratory analysis of volatile organic compounds (VOCs). The detected VOC parameter concentrations identified in all three soil samples comply with the MECP Table 3 Standards with the exception of soil Sample BH3-SS3.

Based on the results of the 2016 investigation, the soil beneath the western portion of the site is impacted with chlorinated solvents (VOCs). The identified VOC parameter within the soil is considered to be a typical degradation compound associated with dry cleaning operations. The chlorinated solvent concentrations in the soil are not considered to represent a concern to the tenants of the subject site. While the impacted soil poses a liability to the subject site, a remedial program is considered to be impractical at this time considering the depth of the impacted soil and the suspected off site source of the contamination. The soil impacts are not considered to be delineated horizontally or vertically at this time. However, it's expected that once the buildings are demolished during the redevelopment of the subject site, a delineation program can be carried out.

Groundwater

Groundwater samples from monitoring wells installed in BH1 and BH3 were recovered and analyzed for chlorinated solvents (VOC) parameters. The detected VOC parameter concentrations were in compliance with MECP Table 3 concentrations with the exception of cis-1,2-dichloroethylene (DCE), tetrachloroethylene (PCE), trichloroethylene (TCE) and vinyl chloride (VC) which exceeded the MECP Table 3 standards during the groundwater sampling program.

Based on the groundwater sampling program completed, groundwater in the southern and western portions of the subject site is considered to be impacted. The identified

VOC parameters within the groundwater are considered to be typical degradation compounds associated with dry cleaning chemicals. The identified groundwater concentrations do not pose a concern to the tenants of the subject buildings. The source of the impacted groundwater is considered to be offsite, and the property is considered to be part of a regional groundwater plume. Prior to a future redevelopment of the property, it is recommended that a remedial program and/or risk assessment be carried out so that a record of site condition be filed for the property, allowing a change of land use to occur.

Recommendations

Contaminant Delineation

The vertical and horizontal delineation of the soil and groundwater impacts will be required as part of both the record of site condition (RSC) and/or risk assessment (RA) process. Additional testing to assess remaining APECs (for PHCs, to assess the former automotive service garage to the east) should also be conducted to satisfy the requirements of the RSC and/or RA process.

Monitoring Wells

It is expected that groundwater monitoring wells will be abandoned in accordance with O.Reg.903, at the time of construction excavation. It is recommended that the integrity of the monitoring wells be maintained, prior to future construction, for possible further groundwater monitoring purposes. Prior to the demolition of the existing buildings it is recommended that all monitoring wells present on site be retested to provide updated groundwater quality.

1.0 INTRODUCTION

At the request of Broccolini, Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment for 208-212 Slater Street, in the City of Ottawa, Ontario. The purpose of this Phase II ESA has been to address areas of potential environmental concern (APECs) identified on the Phase II Property, during the following reports;

- ❒ Phase I-II – Environmental Site Assessment, Existing Commercial Property, 208-212 Slater Street, Ottawa, Ontario, Prepared by Paterson, dated March 3, 2016.
- ❒ Draft Phase I – Environmental Site Assessment, 208-212 Slater Street, Ottawa, Ontario, Prepared by Paterson, dated July 27, 2018.

1.1 Site Description

Address:	208-212 Slater Street, Ottawa, Ontario.
Property Identification Number:	04115-0089
Location:	The subject site is located on the south side of Slater Street, approximately 25m east of Bank Street, in Ottawa, Ontario.
Latitude and Longitude:	45° 25' 09" N, 75° 41' 57" W;
Configuration:	Irregular.
Site Area:	523 m^2 (approximate).

1.2 Property Ownership

The current registered property owner of 208-212 Slater Street is Broccolini, located at 130 Slater Street, Suite 1300, Ottawa, Ontario, K1P 6E2. Paterson was retained to complete this Phase II ESA by Mr. James Beach of Broccolini, and he can be contacted by telephone at 613-244-0076.

1.3 Current and Proposed Future Uses

The subject site is currently occupied with a two storey office/commercial building with a partial basement level. It is our understanding that the subject site will be redeveloped with a multi-storey residential building, with one basement level.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 3 of the document entitled “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, prepared by the Ministry of the Environment, Conservation and Parks (MECP), April 2011. The MECP selected Table 3 Standards are based on the following considerations:

- ❒ Coarse-grained soil conditions
- ❒ Full depth generic site conditions
- ❒ Non-potable groundwater conditions
- ❒ Residential land use

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

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is located in a commercial and residential area. The subject site and surrounding area is generally flat with an elevation of approximately 73 mASL. Site drainage consists of overland flow to catch basins on the adjacent property or Slater Street.

2.2 Past Investigations

Paterson completed a Phase I ESA on July 27, 2018 for the subject site. Based on the Phase I ESA, a total of 44 Potentially Contaminating Activities (PCAs) within the Phase I study area were identified. The majority of these PCAs are not considered to pose a concern to the subject site based on their separation distance from the subject site and/or their down- or cross-gradient location from the Phase I property. However, the former dry cleaners, automotive service garage, and rental car facility are considered to represent APECs on the subject site.

Table 1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern with respect to Phase I Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
Former Dry Cleaners	Throughout the Phase I ESA property	Item 37 - Operation of Dry cleaning equipment (where chemicals are used)	Off-Site	VOCs	Soil and groundwater
Former automotive service garage	East side of Phase I ESA property	Item 10 – Commercial Autobody Shops	Off-Site	BTEX, PHCs	Soil and groundwater
Known Impacted soil location	South portion of Phase I ESA property	Not Applicable	On-Site	VOCs	Soil
Known Impacted Groundwater Plume	Southwest side of the Phase I ESA property	No Applicable	On-Site	VOCs	Groundwater

A Phase II ESA was recommended to address the aforementioned APECs.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

A previous subsurface investigation was conducted on December 10, 2015 and February 10 and 11, 2016. The field program consisted of drilling three (3) boreholes, each of which was instrumented with a groundwater monitoring well. Boreholes were drilled to depths ranging from 5.46 to 7.37 m below the existing grade.

3.2 Media Investigated

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

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on the information from NRCAN, bedrock in the area of the site consists of shale of the Billings Formation. Base on the maps, the thickness of overburden ranges from 3 to 5 m. Overburden consists of offshore marine sediments (silt and clay).

Contaminants of Potential Concern

As per Section 7.1 of this report, identified CPCs on the subject site include PHCs, BTEX, and, VOCs.

Existing Buildings and Structures

The subject site is occupied by a commercial building, occupied by restaurants, a hair salon and other commercial tenants.

Water Bodies

There are no waterbodies on the subject property or within the study area.

Areas of Natural Significance

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

Drinking Water Wells

The subject site is located in an area serviced by municipal drinking water.

Neighbouring Land Use

Neighbouring land use in the Phase I study area consists of commercial and residential. Land use is shown on Drawing PE4362-2 Surrounding Land Use Plan.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Subsection 7.1 of the Phase I ESA report, Potentially Contaminating Activities, and Areas of Potential Environmental Concern identified on the subject site include the former dry cleaners, automotive service garage, known impacted soil on the subject site, and known impacted groundwater on the subject site.

Assessment of Uncertainty and/or Absence of Information

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

3.4 Deviations from Sampling and Analysis Plan

The Sampling and Analysis Plan for this project is included in Appendix 1 of this report. Deviations from the sampling and analysis plan include not taking duplicate or trip blank samples for soil and groundwater. Appropriate trip blanks and duplicate samples are expected to be taken during future works at the subject site. Additionally no PHC testing was completed to address the former automotive service garage to the east.

3.5 Impediments

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

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation was conducted on December 10, 2015 and February 10 and 11, 2016. The field program consisted of drilling three (3) boreholes on the Phase II Property. The boreholes were drilled to a maximum depth of 7.37 m below the existing grade, all of which were completed as groundwater monitoring wells to assess the groundwater table.

The boreholes were placed to address the aforementioned areas of potential environmental concern (APECs). The boreholes were drilled with a portable drill rig provided by CCC Drilling Limited of Ottawa, Ontario. Borehole locations are shown on Drawing PE4362-3 – Test Hole Location Plan, appended to this report.

4.2 Soil Sampling

A total of twelve (12) soil samples were obtained from the boreholes by means of split spoon sampling. The depths at which samples were obtained from the boreholes are shown as "**G**" and "**SS**" on the Soil Profile and Test Data Sheets, appended to this report. Boreholes were advanced into rock and rock core "**RC**" samples taken.

The soil profile encountered consisted of a layer of asphaltic concrete (BH1) or concrete (BH2 and BH3) which was underlain by a layer of silty sand gravel fill which was underlain by a layer of native silty clay which was underlain by glacial till. Shale bedrock was encountered beneath the glacial till in all boreholes. No unusual visual or olfactory observations were made regarding the soil samples obtained from the boreholes. Specific details of the soil profile at each test hole location can be seen on the Soil Profile and Test Data sheets in Appendix 1.

4.3 Field Screening Measurements

All soil samples collected were subjected to a preliminary screening procedure, which included visual screening for colour and evidence of metals, followed by soils vapour screening.

A photo ionization detector (PID) was used to measure the volatile organic vapour concentrations in the headspace of all soil samples recovered from the test pits. The technical protocol was obtained from Appendix C of the MOE document titled "Interim Guidelines for the Remediation of Petroleum

Contamination at Operating Retail and Private Fuel Outlets in Ontario", dated March 1992.

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

To measure the soil vapours, the analyser probe is inserted into the nominal headspace above the soil sample. The sample is agitated/manipulated gently as the measurement is taken. The peak reading registered within the first 15 seconds is recorded as the vapour measurement. The parts per million (ppm) scale is used to measure concentrations of organic vapours.

The PID readings ranged from 0 to 14.5 ppm in the recovered samples. These readings are considered to be indicative of low concentrations of volatile compounds. It should be noted however, that PID readings cannot be used to qualify vapours from heavier petroleum products such as waste oil.

The results of the vapour survey are presented on the Soil Profile and Test Data sheets.

4.4 Groundwater Monitoring Well Installation

Three (3) groundwater monitoring wells were installed on the Phase II Property as part of the current subsurface investigation. The monitoring wells consisted of 31 mm diameter Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 2 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

TABLE 2: Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH1	100.37	7.37	6.00-7.37	5.70-7.37	0.30-5.70	Flushmount
BH2	99.20	6.40	4.90-6.40	4.60-6.40	0.30-4.60	Flushmount
BH3	98.26	5.46	4.10-5.46	3.80-5.46	0.30-3.80	Flushmount

4.5 Field Measurement of Water Quality Parameters

Groundwater samples were collected from BH1 on December 15, 2016 and BH3 on February 16, 2017 and July 6, 2018. During the 2017 groundwater sampling

events, no groundwater was present in the well in BH2. BH1 was not sampled on February 16, 2017 and no groundwater was present at the time of the field sampling on July 6, 2018. No water quality parameters were measured in the field at that time. Water quality parameters were omitted due to the expected impacted groundwater, which may cause cross-contamination issues.

4.6 Groundwater Sampling

Groundwater sampling protocols were followed using the MECP document entitled “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario”, dated May 1996. Groundwater samples were obtained from each monitoring well, using dedicated sampling equipment. Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation. Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.7 Analytical Testing

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

TABLE 3: Soil Samples Submitted

Sample ID	Sample Depth / Stratigraphic Unit	Parameters Analyzed	Rationale
		VOCs	
BH1-SS6	3.81-3.94m, Silty Clay	X	Assess potential soil impacts relating to the former offsite dry cleaners.
BH2-SS2	1.82-2.42m, Till	X	Assess potential soil impacts relating to the former offsite dry cleaners and the former automotive service garage.
BH3-SS3	2.75-3.35m, Till	X	Assess potential soil impacts relating to the offsite dry cleaners.

TABLE 4: Groundwater Samples Submitted			
Sample ID	Screened Interval/ Stratigraphic Unit	Parameters Analyzed	Rationale
		VOCs	
BH1-GW1	6.00-7.37 m, Bedrock	X	Assess potential impacts from former offsite dry cleaners
BH3-GW1	4.10-5.46 m, Bedrock	X	Assess potential impacts from former offsite dry cleaners
BH3-GW	4.10-5.46 m, Bedrock	X	Confirm groundwater quality from BH3-GW1

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

4.8 Residue Management

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

4.9 Elevation Surveying

An elevation survey of all borehole locations was completed by Paterson at the time of the subsurface investigation. All borehole elevations are relative to a catch basin with an assumed elevation of 100.00 m, as presented on Drawing PE4362-3, Test Hole Location Plan.

4.10 Quality Assurance and Quality Control Measures

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

5.0 REVIEW AND EVALUATION

5.1 Geology

The soil profile consists of a pavement structure over fill material, underlain by silty clay followed by glacial till, followed by shale bedrock.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling events on December 15, 2016 (BH1), February 16, 2017 (BH3) and July 6, 2018 (BH3), using an electronic water level meter. Groundwater levels are summarized below in Table 5. All borehole elevations are relative to a catch basin with an assumed elevation of 100.00 m.

TABLE 5: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH1	100.37	5.70	94.67	December 15, 2016
BH3	99.20	5.10	94.10	February 16, 2017
BH3	98.26	5.05	93.21	July 6, 2018

It has not been possible to determine groundwater flow direction or gradient however it is expected that groundwater flows to the north.

5.3 Fine-Coarse Soil Texture

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

5.4 Soil: Field Screening

Field screening of the soil samples collected during drilling resulted in vapour readings ranging from 0.0 ppm to 14.5 ppm. No visual or olfactory indications of potential contamination were identified in the soil samples at the time of the field program. The field screening results of each individual soil sample are provided on the Soil Profile and Test Data Sheets appended to this report.

5.5 Soil Quality

The soil results from the 2016 Phase II ESA are presented below. The soil samples were submitted for VOC analysis with the results of the analytical testing are presented in Table 6. The laboratory certificates of analysis are provided in Appendix 1.

Table 6 Analytical Test Results – Soil – VOCs

Parameter	MDL (µg/g)	Soil Samples (µg/g)			MECP Table 3 Standards
		December 10, 2015	February 10, 2016	February 11, 2016	
		BH1-SS6	BH2-SS2	BH3-SS3	
Acetone	0.5	nd	nd	nd	16
Benzene	0.02	nd	nd	nd	0.21
Bromodichloromethane	0.05	nd	nd	nd	13
Bromoform	0.05	nd	nd	nd	0.27
Bromomethane	0.05	nd	nd	nd	0.05
Carbon Tetrachloride	0.05	nd	nd	nd	0.05
Chlorobenzene	0.05	nd	nd	nd	2.4
Chloroform	0.05	nd	nd	nd	0.05
Dibromochloromethane	0.05	nd	nd	nd	9.4
Dichlorodifluoromethane	0.05	nd	nd	nd	16
1,2-Dichlorobenzene	0.05	nd	nd	nd	3.4
1,3-Dichlorobenzene	0.05	nd	nd	nd	4.8
1,4-Dichlorobenzene	0.05	nd	nd	nd	0.083
1,1-Dichloroethane	0.05	nd	nd	nd	3.5
1,2-Dichloroethane	0.05	nd	nd	nd	0.05
1,1-Dichloroethylene	0.05	nd	nd	nd	0.05
cis-1,2-Dichloroethylene	0.05	nd	nd	nd	3.4
trans-1,2-Dichloroethylene	0.05	nd	nd	nd	0.084
1,2-Dichloropropane	0.05	nd	nd	nd	0.05
1,3-Dichloropropene	0.05	nd	nd	nd	0.05
Ethylbenzene	0.05	nd	nd	0.07	2
Ethylene Dibromide	0.05	nd	nd	nd	0.05
Hexane	0.05	nd	nd	nd	2.8
Methyl Ethyl Ketone	0.05	nd	nd	nd	16
Methyl Isobutyl Ketone	0.05	nd	nd	nd	1.7
Methyl tert-butyl Ether	0.05	nd	nd	nd	0.75
Methylene Chloride	0.05	nd	nd	nd	0.1
Styrene	0.05	nd	nd	nd	0.7
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	0.058
1,1,2,2-Tetrachloroethane	0.05	nd	nd	nd	0.05
Tetrachloroethylene	0.05	nd	nd	nd	0.28
Toluene	0.05	nd	nd	nd	2.3
1,1,1-Trichloroethane	0.05	nd	nd	nd	0.38
1,1,2-Trichloroethane	0.05	nd	nd	**0.77**	0.05
Trichloroethylene	0.05	nd	nd	nd	0.061
Trichlorofluoromethane	0.05	nd	nd	nd	4
Vinyl Chloride	0.02	nd	nd	nd	0.02
Xylenes	0.05	nd	nd	nd	3.1

Notes:
- MDL – Method Detection Limit;
- nd – not detected above the MDL
- **Bold** – Value exceeds selected MECP standards

No detectable VOC concentrations were identified in the soil samples analysed from BH1 and BH2. The detected VOC parameter concentrations identified in soil Sample BH3-SS3 comply with the MECP Table 3 Standards with one exception.

The 1,1,2-trichloroethane concentration identified in soil sample BH3-SS3 is in excess of the MECP Table 3 Standards.

5.6 Groundwater Quality

Groundwater samples were taken from monitoring wells installed in BH1 and BH3 on December 15, 2016 (BH1), February 16, 2017 (BH3). An additional groundwater sample was collected from BH3 on July 6, 2018. The water samples were submitted for VOC analysis with the results of the analytical testing and the selected groundwater standards presented in Table 7. The groundwater samples were obtained from the screened intervals noted on Table 4. The laboratory certificates of analysis are provided in Appendix 1.

Table 7 Analytical Test Results – Groundwater – VOCs

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MECP Table 3 Standards
		Dec 15, 2016 BH1-GW1	Feb, 16, 2017 BH3-GW1	July 6, 2018 BH3-GW	
Acetone	5.0	nd	nd	nd	130 000
Benzene	0.5	2.6	nd	nd	44
Bromodichloromethane	0.5	nd	nd	nd	85 000
Bromoform	0.5	nd	nd	nd	380
Bromomethane	0.5	nd	nd	nd	5.6
Carbon Tetrachloride	0.2	nd	nd	nd	0.79
Chlorobenzene	0.5	nd	nd	nd	630
Chloroform	0.5	3.7	nd	nd	2.4
Dibromochloromethane	0.5	nd	nd	nd	82 000
Dichlorodifluoromethane	1.0	nd	nd	nd	4 400
1,2-Dichlorobenzene	0.5	nd	nd	nd	4 600
1,3-Dichlorobenzene	0.5	nd	nd	nd	3 600
1,4-Dichlorobenzene	0.5	nd	nd	nd	8
1,1-Dichloroethane	0.5	nd	nd	nd	320
1,2-Dichloroethane	0.5	nd	nd	nd	1.6
1,1-Dichloroethylene	0.5	nd	nd	nd	1.6
cis-1,2-Dichloroethylene	0.5	**25.2**	**52**	**84.3**	1.6
trans-1,2-Dichloroethylene	0.5	1.1	nd	nd	1.6
1,2-Dichloropropane	0.5	nd	nd	nd	16
1,3-Dichloropropene	0.5	nd	nd	nd	5.2
Ethylbenzene	0.5	nd	nd	nd	2 300
Ethylene Dibromide	0.2	nd	nd	nd	0.25
Hexane	1.0	nd	nd	nd	51
Methyl Ethyl Ketone	5.0	nd	nd	nd	470 000
Methyl Isobutyl Ketone	5.0	nd	nd	nd	140 000
Methyl tert-butyl Ether	2.0	nd	nd	nd	190
Methylene Chloride	5.0	nd	nd	nd	610
Styrene	0.5	nd	nd	nd	1 300
1,1,1,2-Tetrachloroethane	0.5	nd	nd	nd	3.3
1,1,2,2-Tetrachloroethane	0.5	nd	nd	nd	3.2
Tetrachloroethylene	0.5	**900**	**80**	**151**	1.6
Toluene	0.5	19.4	nd	nd	18 000
1,1,1-Trichloroethane	0.5	nd	nd	nd	640

Table 7 Analytical Test Results – Groundwater – VOCs

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MECP Table 3 Standards
		Dec 15, 2016 BH1-GW1	Feb, 16, 2017 BH3-GW1	July 6, 2018 BH3-GW	
1,1,2-Trichloroethane	0.5	nd	nd	nd	4.7
Trichloroethylene	0.5	**49.3**	**152**	**164**	1.6
Trichlorofluoromethane	1.0	nd	nd	nd	2 500
Vinyl Chloride	0.5	nd	**3.3**	**11.9**	0.5
Xylenes	0.5	2.9	nd	nd	4 200

Notes:
- MDL – Method Detection Limit;
- nd – not detected above the MDL
- **Bold** – Value exceeds selected MECP standards

Several groundwater parameters (cis-1,2-Dichloroethylene, Tetrachloroethylene, Trichloroethylene, and Vinyl Chloride) were identified in excess of the MECP Table 3 Standards during the groundwater sampling program.

5.7 Quality Assurance and Quality Control Results

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

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

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

5.8 Phase II Conceptual Site Model

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

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

As indicated in the Phase I-ESA report and Section 2.2 of this report, the following PCAs are considered to result in APECs on the Phase I/Phase II Property:

- Former offsite Dry Cleaners;
- Former offsite automotive service garage;
- Known Impacted soil location on the west side of Phase I ESA property;
- Known impacted groundwater plume on the south side of the phase I ESA property;

Contaminants of potential concern associated with the aforementioned PCAs include a combination of PHCs (F1-F4), BTEXs and VOCs in the groundwater and/or soil.

Subsurface Structures and Utilities

Underground service locates were completed prior to the subsurface investigation. Underground utilities on the Phase II Property include natural gas, sewer and water services. The subject property and surrounding area is municipally serviced and no drinking water wells are considered to be present in the study area.

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is illustrated on Drawing PE4362-5. The stratigraphy consists of:

- A pavement structure or concrete floor slab consisting of approximately 0.10 m of asphaltic concrete or reinforced concrete over crushed stone.

- Fill material generally consisting of brown silty sand gravel beneath the surface structure and extending to depths ranging from approximately 0.51 m and 0.86 m below the existing grade.
- Stiff brown silty clay was encountered beneath the fill extending to depths ranging from approximately 1.45 m and 3.94 m below the existing grade.
- Glacial till comprised of silty sand with sand, gravel and cobbles. Till material extends to depths ranging from approximately 3.10 to 5.92 m below the existing grade.
- Weathered shale bedrock was identified beneath the till, extending to the base of the boreholes from approximately 5.46 to 7.37 m below the existing grade.

Hydrogeological Characteristics

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

Water levels were measured at the subject site on December 15, 2016 and BH3 on February 16, 2017 and July 6, 2018, at depths ranging from 5.05 to 5.10 m below grade. It has not been possible to determine groundwater flow direction or gradient however it is expected that groundwater flows in a northerly direction.

Approximate Depth to Bedrock

Bedrock is present from 3.10 to 5.92 m below existing grade.

Approximate Depth to Water Table

Depth to water table at the subject site is expected to be present between 5 and 5.7m below the existing grade.

Sections 41 and 43.1 of the Regulation

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

Section 43.1 of the Regulation does not apply to the subject site in that the subject site is not a Shallow Soil Property.

Fill Placement

Fill material was identified across the Phase II Property beneath the pavement structure and extending to depths ranging from 0.51 m and 0.86 m below grade. The fill material is suspected to have been placed during the regrading of the site during the construction of the current building.

Proposed Buildings and Other Structures

It is our understanding that the property is to be redeveloped with a multi-storey residential building with one basement level.

Areas of Natural Significance and Water Bodies

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

There are no waterbodies on the subject property or within the Phase I ESA study area.

Environmental Condition

Areas Where Contaminants are Present

Impacted soil was identified in BH3. All other soil samples submitted for analysis are in compliance with the MECP Table 3 Standards. Groundwater in excess of the MECP Table 3 Standards was identified in BH1 and BH3. Analytical test results are shown on Drawings PE4362-4 – Analytical Testing Plan.

Types of Contaminants

Several VOC parameters exceeded the Table 3 Standards in the soil and groundwater tested. No other analytical parameters were analysed. The detected parameters are considered to be degradation by-products of dry cleaning chemicals.

Contaminated Media

Soil and groundwater are considered impacted on the subject site.

Known Areas Where Contaminants Are Present

Impacted soil was identified along the west property line of the Phase II ESA property. Impacted groundwater was identified on the southern portion of the Phase II ESA property, although no groundwater samples were available from the northern portion and the groundwater impacts are not considered to be delineated horizontally or vertically. Analytical test results are shown on Drawings PE4362-4 – Analytical Testing Plan.

Distribution and Migration of Contaminants

The source of the impacted soil and groundwater is considered to be offsite, and the property is considered to be part of a regional groundwater plume.

Discharge of Contaminants

No ongoing discharge of contaminants is considered to be ongoing as the off-site dry cleaning operation has ceased. Although it is expected that the source of the VOC impacts has not undergone a remediation process and ongoing passive discharge to the soil and groundwater is still occurring.

Climatic and Meteorological Conditions

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

In general the subject site and adjacent properties are fully covered in impermeable surfaces. These impermeable surfaces are considered to nullify the impacts climactic and meteorological conditions have on contaminant transport.

Potential for Vapour Intrusion

The potential for vapour intrusion is considered to be low based on the concentrations and nature of the VOC parameters recorded.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for 208-212 Slater Street, in the City of Ottawa, Ontario. The purpose of the Phase II-ESA was to address potentially contaminating activities (PCAs) that were identified during the Phase I-ESA and considered to result in areas of potential environmental concern (APECs) on the Phase II-ESA property. The subsurface investigation consisted of drilling 3 boreholes, all of which were constructed with groundwater monitoring wells.

Soil

Soil samples were obtained from the boreholes and screened using visual observations and organic vapour measurements. Three soil samples were submitted for laboratory analysis of volatile organic compounds (VOCs). The detected VOC parameter concentrations identified in all three soil samples comply with the MECP Table 3 Standards with the exception of soil Sample BH3-SS3.

Based on the results of the 2016 investigation, the soil beneath the western portion of the site is impacted with chlorinated solvents (VOCs). The identified VOC parameter within the soil is considered to be a typical degradation compound associated with dry cleaning operations. The chlorinated solvent concentrations in the soil are not considered to represent a concern to the tenants of the subject site. While the impacted soil poses a liability to the subject site, a remedial program is considered to be impractical at this time considering the depth of the impacted soil and the suspected off site source of the contamination. The soil impacts are not considered to be delineated horizontally or vertically at this time. However, it's expected that once the buildings are demolished during the redevelopment of the subject site, a delineation program can be carried out.

Groundwater

Groundwater samples from monitoring wells installed in BH1 and BH3 were recovered and analyzed for chlorinated solvents (VOC) parameters. The detected VOC parameter concentrations were in compliance with MECP Table 3 concentrations with the exception of cis-1,2-dichloroethylene (DCE), tetrachloroethylene (PCE), trichloroethylene (TCE) and vinyl chloride (VC) which exceeded the MECP Table 3 standards during the groundwater sampling program.

Based on the groundwater sampling program completed, groundwater in the southern and western portions of the subject site is considered to be impacted. The identified VOC parameters within the groundwater are considered to be typical degradation compounds associated with dry cleaning chemicals. The identified groundwater concentrations do not pose a concern to the tenants of the subject buildings. The source of the impacted groundwater is considered to be offsite, and the property is considered to be part of a regional groundwater plume. Prior to a future redevelopment of the property, it is recommended that a remedial program and/or risk assessment be carried out so that a record of site condition be filed for the property, allowing a change of land use to occur.

Recommendations

Contaminant Delineation

The vertical and horizontal delineation of the soil and groundwater impacts will be required as part of both the record of site condition (RSC) and/or risk assessment (RA) process. Additional testing to assess remaining APECs (for PHCs, to assess the former automotive service garage to the east) should also be conducted to satisfy the requirements of the RSC and/or RA process.

Monitoring Wells

It is expected that groundwater monitoring wells will be abandoned in accordance with O.Reg.903, at the time of construction excavation. It is recommended that the integrity of the monitoring wells be maintained, prior to future construction, for possible further groundwater monitoring purposes. Prior to the demolition of the existing buildings it is recommended that all monitoring wells present on site be retested to provide updated groundwater quality.

7.0 STATEMENT OF LIMITATIONS

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

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

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

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

Paterson Group Inc.

Michael Beaudoin P.Eng., QP_{ESA}

Carlos P. Da Silva, P.Eng., ing, QP_{ESA}

Report Distribution:

- Broccolini
- Paterson Group

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE4362-3 – SITE PLAN

DRAWING PE4362-3 – TEST HOLE LOCATION PLAN

FIGURE 1

KEY PLAN

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN:

1. FORMER DRY CLEANERS - 139 BANK STREET
2. FORMER AUTOMOTIVE SERVICE GARAGE - 263 LAURIER AVENUE WEST
3. IMPACTED SOIL
4. IMPACTED GROUNDWATER

#215 SLATER STREET
COMMERCIAL / OFFICES

S L A T E R S T R E E T

#269 BANK STREET
COMMERCIAL / OFFICES

2

1

208 - 212 SLATER STREET

4

3

LANEWAY

ASPHALTIC CONCRETE

PARKING

#129 BANK STREET
STARBUCKS

#133 BANK STREET
RESTAURANT

#135 BANK STREET
BARBER SHOP

#137 BANK STREET
RINGS ETC.

#139 BANK STREET
MORNING OWL COFFEE SHOP

#147 BANK STREET
IMAGES ON BANK

#149 BANK STREET
SPORTS 4

#153 BANK STREET
RESTAURANT

#157 BANK STREET
KIDDY TOWN LTD.

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NO.	REVISIONS	DATE	INITIAL
0			

BROCCOLINI

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
208-212 SLATER STREET

OTTAWA, ONTARIO

Title: **SITE PLAN**

Scale: 1:200	Date: 07/2018
Drawn by: RCG	Report No.: PE4362-1
Checked by: MB	Dwg. No.: **PE4362-1**
Approved by: CDS	Revision No.: 0

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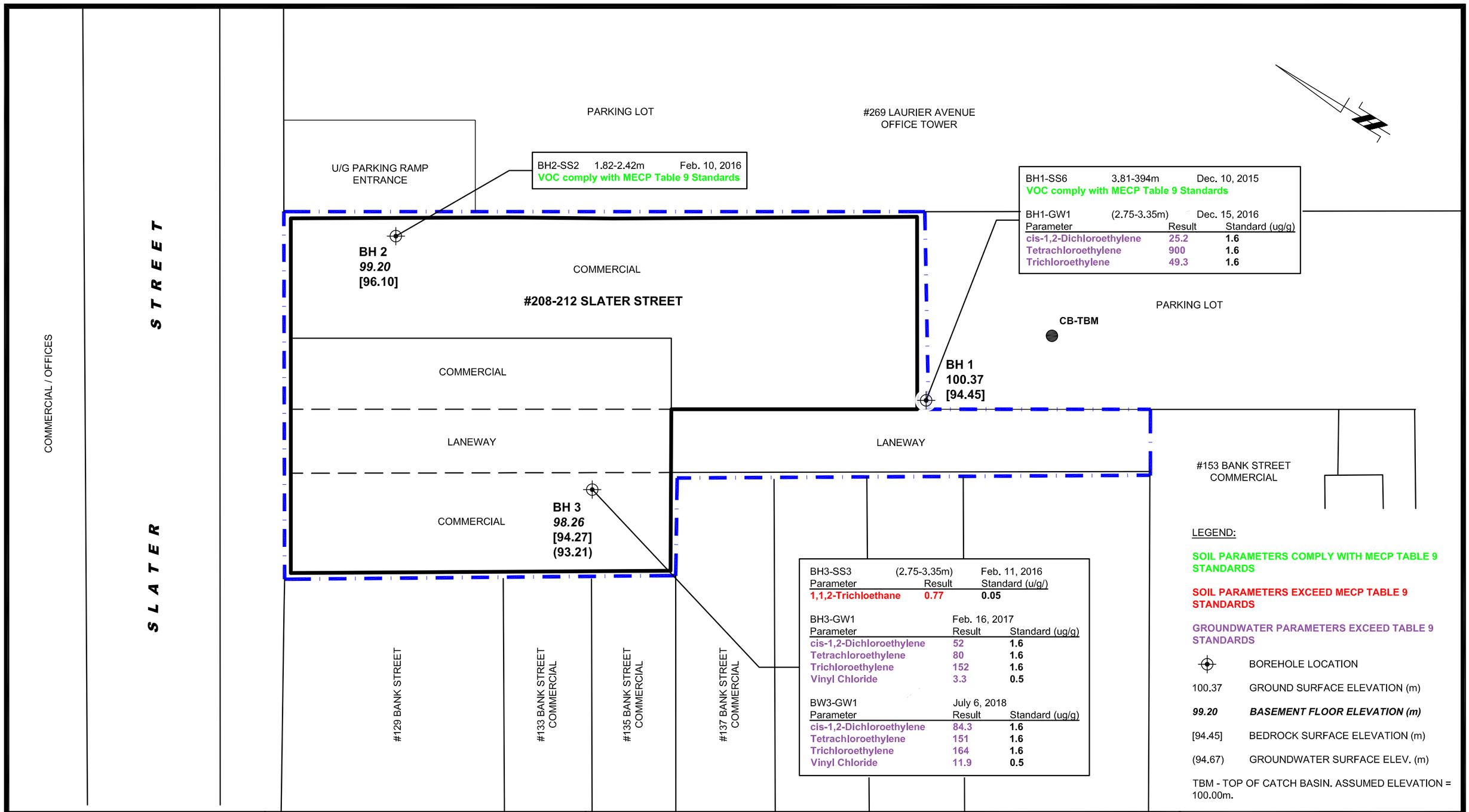

LEGEND:

SOIL PARAMETERS COMPLY WITH MECP TABLE 9 STANDARDS

SOIL PARAMETERS EXCEED MECP TABLE 9 STANDARDS

GROUNDWATER PARAMETERS EXCEED TABLE 9 STANDARDS

⊕	BOREHOLE LOCATION
100.37	GROUND SURFACE ELEVATION (m)
99.20	***BASEMENT FLOOR ELEVATION (m)***
[94.45]	BEDROCK SURFACE ELEVATION (m)
(94.67)	GROUNDWATER SURFACE ELEV. (m)

TBM - TOP OF CATCH BASIN. ASSUMED ELEVATION = 100.00m.

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NO.	REVISIONS	DATE	INITIAL
0			

BROCCOLINI

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
COMMERCIAL PROPERTY - 208-212 SLATER STREET

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:200	Date: 05/2019
Drawn by: MPG	Report No.: PE4362-REP.02
Checked by: MB	Dwg. No.: PE4362-3
Approved by: CDS	Revision No.:

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APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

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Sampling & Analysis Plan

Phase II Environmental Site Assessment
208-212 Slater Street
Ottawa, Ontario

Prepared For

Broccolini Construction

July 2018

Report: PE4455-SAP

Table of Contents

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1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Broccolini to conduct a Phase II Environmental Site Assessment (ESA) at 208-212 Slater Street, in the City of Ottawa, Ontario. Based on a previous Phase II ESA and a more recent Phase I ESA completed by Paterson for the subject property, a subsurface investigation program, consisting of water sampling, was developed.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1	South edge of existing building to assess the former dry cleaners	Intercept groundwater table to collect water sample.
BH2	Northeast corner of site to assess the former dry cleaners and former automotive service garage.	Intercept groundwater table to collect water sample.
BH3	West edge of the site to assess the former dry cleaners.	Intercept groundwater table to collect water sample.

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

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

The standard operating procedures for a typical field program are outlined below, however only water testing was completed as part of this Phase II ESA>

2.0 ANALYTICAL TESTING PROGRAM

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

- ❒ At least one sample from each borehole should be submitted, in order to delineate the horizontal extent of contamination across the site.
- ❒ At least one sample from each stratigraphic unit should be submitted, in order to delineate the vertical extent of contamination at the site.
- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the

presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MOECC site condition standards.

- ❒ In boreholes with evidence of contamination as described above, a sample should be submitted from the stratigraphic unit below the 'worst-case' sample to determine whether the contaminant(s) have migrated downward.
- ❒ Parameters analyzed should be consistent with the Contaminants of Potential Concern identified in the Phase I ESA.

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

- ❒ Groundwater monitoring wells should be installed in all boreholes with visual or olfactory evidence of soil contamination, in stratigraphic units where soil contamination was encountered, where those stratigraphic units are at or below the water table (i.e. a water sample can be obtained).
- ❒ Groundwater monitoring well screens should straddle the water table at sites where the contaminants of concern are suspected to be LNAPLs.
- ❒ At least one groundwater monitoring well should be installed in a stratigraphic unit below the suspected contamination, where said stratigraphic unit is water-bearing.
- ❒ Parameters analyzed should be consistent with the Contaminants of Concern identified in the Phase I ESA and with the contaminants identified in the soil samples.

3.0 STANDARD OPERATING PROCEDURES

3.1 Environmental Drilling Procedure

Purpose

The purpose of environmental boreholes is to identify and/or delineate contamination within the soil and/or to install groundwater monitoring wells in order to identify contamination within the groundwater.

Equipment

The following is a list of equipment that is in addition to regular drilling equipment stated in the geotechnical drilling SOP:

- ❒ glass soil sample jars
- ❒ two buckets
- ❒ cleaning brush (toilet brush works well)
- ❒ dish detergent
- ❒ methyl hydrate
- ❒ water (if not available on site - water jugs available in trailer)
- ❒ latex or nitrile gloves (depending on suspected contaminant)
- ❒ RKI Eagle organic vapour meter or MiniRae photoionization detector (depending on contamination suspected)

Determining Borehole Locations

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

After drilling is completed a plan with the borehole locations must be provided. Distances and orientations of boreholes with respect to site features (buildings, roadways, etc.) must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Ground surface elevations at each borehole should be surveyed relative to a fire hydrant located on south side of Lisgar Street (300 Lisgar Street), with geodetic elevation of 72.57m above sea level (asl).

Drilling Procedure

The actual drilling procedure for environmental boreholes is the same as geotechnical boreholes (see SOP for drilling and sampling) with a few exceptions as follows:

- ❒ Continuous split spoon samples (every 0.6 m or 2') or semi-continuous (every 0.76 m or 2'6") are required.
- ❒ Make sure samples are well sealed in plastic bags with no holes prior to screening and are kept cool but unfrozen.
- ❒ If sampling for VOCs, BTEX, or PHCs F1, a soil core from each soil sample which may be analyzed must be taken and placed in the laboratory-provided methanol vial.
- ❒ Note all and any odours or discolouration of samples.
- ❒ Split spoon samplers must be washed between samples.
- ❒ If obvious contamination is encountered, continue sampling until vertical extent of contamination is delineated.

- ❒ As a general rule, environmental boreholes should be deep enough to intercept the groundwater table (unless this is impossible/impractical - call project manager to discuss).
- ❒ If at all possible, soil samples should be submitted to a preliminary screening procedure on site, either using a RKI Eagle, PID, etc. depending on type of suspected contamination.

Spoon Washing Procedure

All sampling equipment (spilt spoons, etc.) must be washed between samples in order to prevent cross contamination of soil samples.

- ❒ Obtain two buckets of water (preferably hot if available)
- ❒ Add a small amount of dish soap to one bucket
- ❒ Scrub spoons with brush in soapy water, inside and out, including tip
- ❒ Rinse in clean water
- ❒ Apply a small amount of methyl hydrate to the inside of the spoon. (A spray bottle or water bottle with a small hole in the cap works well)
- ❒ Allow to dry (takes seconds)
- ❒ Rinse with distilled water, a spray bottle works well.

The methyl hydrate eliminates any soap residue that may be on the spoon, and is especially important when dealing with suspected VOCs.

Screening Procedure

The RKI Eagle is used to screen most soil samples, particularly where petroleum hydrocarbon contamination is suspected. The MiniRae is used when VOCs are suspected, however it also can be useful for detecting petroleum. These tools are for screening purposes only and cannot be used in place of laboratory testing. Vapour results obtained from the RKI Eagle and the PID are relative and must be interpreted.

Screening equipment should be calibrated on an approximately monthly basis, more frequently if heavily used.

- ❒ Samples should be brought to room temperature; this is specifically important in colder weather. Soil must not be frozen.
- ❒ Turn instrument on and allow to come to zero - calibrate if necessary
- ❒ If using RKI Eagle, ensure instrument is in methane elimination mode unless otherwise directed.

- ❒ Ensure measurement units are ppm (parts per million) initially. RKI Eagle will automatically switch to %LEL (lower explosive limit) if higher concentrations are encountered.
- ❒ Break up large lumps of soil in the sample bag, taking care not to puncture bag.
- ❒ Insert probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in bag while observing instrument readings.
- ❒ Record the highest value obtained in the first 15 to 25 seconds
- ❒ Make sure to indicate scale (ppm or LEL); also note which instrument was used (RKI Eagle 1 or 2, or MiniRae).
- ❒ Jar samples and refrigerate as per Sampling and Analysis Plan.

3.2 Monitoring Well Installation Procedure

Equipment

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

Procedure

- ❒ Drill borehole to required depth, using drilling and sampling procedures described above.
- ❒ If borehole is deeper than required monitoring well, backfill with bentonite chips to required depth. This should only be done on wells where contamination is not suspected, in order to prevent downward migration of contamination.
- ❒ Only one monitoring well should be installed per borehole.
- ❒ Monitoring wells should not be screened across more than one stratigraphic unit to prevent potential migration of contaminants between units.
- ❒ Where LNAPLs are the suspected contaminants of concern, monitoring wells should be screened straddling the water table in order to capture any free product floating on top of the water table.

- ❒ Thread the end cap onto a section of screen. Thread second section of screen if required. Thread risers onto screen. Lower into borehole to required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials entering well.
- ❒ As drillers remove augers, backfill borehole annulus with silica sand until the level of sand is approximately 0.3 m above the top of the screen.
- ❒ Backfill with holeplug until at least 0.3 m of holeplug is present above the top of the silica sand.
- ❒ Backfill remainder of borehole with holeplug or with auger cuttings (if contamination is not suspected).
- ❒ Install flushmount casing. Seal space between flushmount and borehole annulus with concrete, cold patch, or holeplug to match surrounding ground surface.

3.3 Monitoring Well Sampling Procedure

Equipment

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

Sampling Procedure

- ❒ Locate well and use socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to existing ground surface, using water level meter or interface probe. If using interface probe on suspected NAPL site, measure the thickness of free product.
- ❒ Measure total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate volume of standing water within well and record.

- ❒ Insert polyethylene tubing into well and attach to peristaltic pump. Turn on peristaltic pump and purge into graduated bucket. Purge at least three well volumes of water from the well. Measure and record field chemistry. Continue to purge, measuring field chemistry after every well volume purged, until appearance or field chemistry stabilizes.
- ❒ Note appearance of purge water, including colour, opacity (clear, cloudy, silty), sheen, presence of LNAPL, and odour. Note any other unusual features (particulate matter, effervescence (bubbling) of dissolved gas, etc.).
- ❒ Fill required sample bottles. If sampling for metals, attach 75-micron filter to discharge tube and filter metals sample. If sampling for VOCs, use low flow rate to ensure continuous stream of non-turbulent flow into sample bottles. Ensure no headspace is present in VOC vials.
- ❒ Replace well cap and flushmount casing cap.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

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

- ❒ All non-dedicated sampling equipment (split spoons) will be decontaminated according to the SOPs listed above.

- ❒ All groundwater sampling equipment is dedicated (polyethylene and flexible peristaltic tubing is replaced for each well).

- ❒ Where groundwater samples are to be analyzed for VOCs, one laboratory-provided trip blank will be submitted for analysis with every laboratory submission.

- ❒ Approximately one (1) field duplicate will be submitted for every ten (10) samples submitted for laboratory analysis. A minimum of one (1) field duplicate per project will be submitted. Field duplicates will be submitted for soil and groundwater samples

- ❒ Where combo pens are used to measure field chemistry, they will be calibrated on an approximately monthly basis, according to frequency of use.

5.0 DATA QUALITY OBJECTIVES

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

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

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

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

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

It is also important to consider data quality in the overall context of the project. For example, if the DQOs are not met for a given sample, yet the concentrations of contaminants in both the sample and the duplicate exceed the MOE site remediation standards by a large margin, the decision-making usefulness of the sample may not be considered to be impaired. The proximity of other samples which meet the DQOs must also be considered in developing the Phase II Conceptual Site Model; often there are enough data available to produce a reliable Phase II Conceptual Site Model even if DQOs are not met for certain individual samples.

These considerations are discussed in the body of the report.

6.0 PHYSICAL IMPEDIMENTS TO SAMPLING & ANALYSIS PLAN

Physical impediments to the Sampling and Analysis plan may include:

- ❒ The location of underground utilities
- ❒ Poor recovery of split-spoon soil samples

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

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

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SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
208-212 Slater Street
Ottawa, Ontario

DATUM TBM - Top of grate of catch basin. Assumed elevation = 100.00m.

FILE NO. PE4362

REMARKS

HOLE NO. BH 1

BORINGS BY Portable Drill **DATE** 2015 December 10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Asphaltic concrete 0.10		G	1			0	100.37
FILL: Crushed stone, some sand, occasional asphalt pieces 0.51							
		SS	2	17		1	99.37
FILL: Brown silty sand with crushed stone		SS	3	4		2	98.37
2.44							
		SS	4	88		3	97.37
Stiff, brown **SILTY CLAY**		SS	5	100			
3.94		SS	6	100		4	96.37
		RC	1			5	95.37
GLACIAL TILL: Brown silty clay, some sand, gravel, cobbles							
5.92		RC	2	42		6	94.37
		RC	3	27	0		
BEDROCK: Black shale		RC	4	4	0	7	93.37
7.37							
End of Borehole							
(GWL @ 5.70m - July 6, 2018)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
208-212 Slater Street
Ottawa, Ontario

DATUM TBM - Top of grate of catch basin. Assumed elevation = 100.00m.

FILE NO. PE4362

REMARKS

HOLE NO. BH 2

BORINGS BY Portable Drill **DATE** 2016 February 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.20
Concrete floor slab 0.05							
FILL: Crushed stone 0.51							
Brown **SILTY CLAY,** trace gravel						1	98.20
1.45		SS	1	79			
		SS	2	54		2	97.20
GLACIAL TILL: Brown silty sand with gravel							
3.10						3	96.20
		RC	1	73	39		
						4	95.20
BEDROCK: Black shale		RC	2	92	54	5	94.20
		RC	3	84	32	6	93.20
6.40							
End of Borehole							
(Borehole dry - July 6, 2018)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
208-212 Slater Street
Ottawa, Ontario

DATUM TBM - Top of grate of catch basin. Assumed elevation = 100.00m.

FILE NO. PE4362

REMARKS

HOLE NO. BH 3

BORINGS BY Portable Drill **DATE** 2016 February 10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Concrete floor slab 0.05						0	98.26
FILL: Crushed stone, some cobbles 0.86							
		G	1			1	97.26
Brown **SILTY CLAY,** trace gravel 2.11						2	96.26
		SS	2	56			
GLACIAL TILL: Black silty sand with shale and gravel, some clay		SS	3	33		3	95.26
3.99		SS	4	69			
		RC	1	100	0	4	94.26
		RC	2	100	0		
BEDROCK: Black shale		RC	3	100	17	5	93.26
5.46							
End of Borehole							
(GWL @ 5.05m - July 6, 2018)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

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

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

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

ROCK DESCRIPTION

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

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

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

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

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

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

CONSOLIDATION TEST

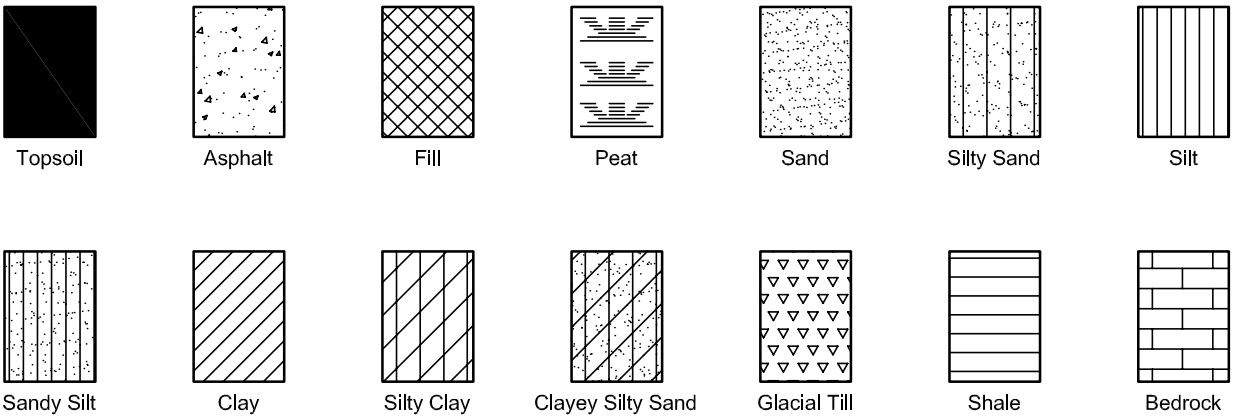
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

PERMEABILITY TEST

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

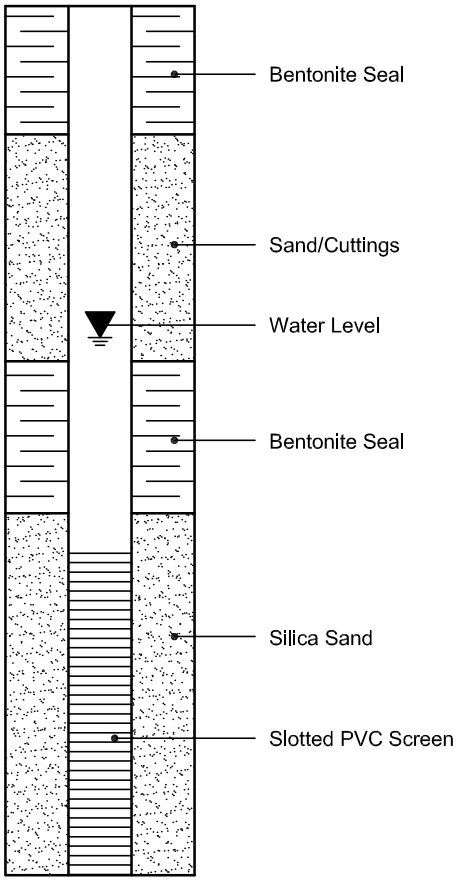
SYMBOLS AND TERMS (continued)

STRATA PLOT

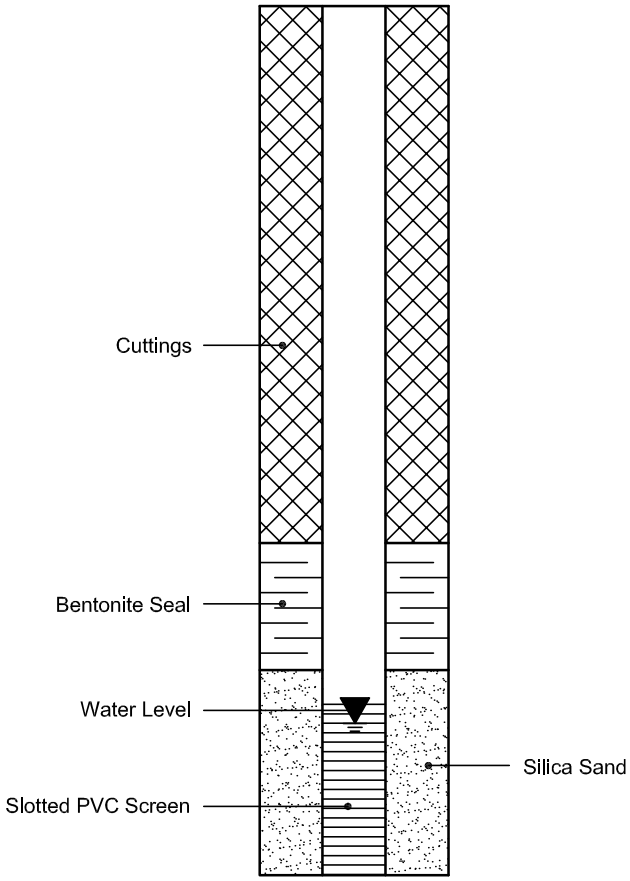


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

Client PO: 19116
Project: PE3693
Custody: 106582

Report Date: 17-Dec-2015
Order Date: 11-Dec-2015

Order #: 1550387

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

Paracel ID	Client ID
1550387-01	BH1-SS6

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 19116

Report Date: 17-Dec-2015
Order Date: 11-Dec-2015
Project Description: PE3693

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	15-Dec-15	17-Dec-15
Solids, %	Gravimetric, calculation	14-Dec-15	14-Dec-15

Certificate of Analysis

Report Date: 17-Dec-2015

Client: Paterson Group Consulting Engineers

Order Date: 11-Dec-2015

Client PO: 19116

Project Description: PE3693

	Client ID:	BH1-SS6	-	-	-
	Sample Date:	10-Dec-15	-	-	-
	Sample ID:	1550387-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	65.8	-	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Report Date: 17-Dec-2015

Client: Paterson Group Consulting Engineers

Order Date: 11-Dec-2015

Client PO: 19116

Project Description: PE3693

	Client ID:	BH1-SS6	-	-	-
	Sample Date:	10-Dec-15	-	-	-
	Sample ID:	1550387-01	-	-	-
	MDL/Units	Soil	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	99.5%	-	-	-
Dibromofluoromethane	Surrogate	98.4%	-	-	-
Toluene-d8	Surrogate	99.5%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*7.82*		*ug/g*		*97.7*	*50-140*			
Surrogate: Dibromofluoromethane	*7.40*		*ug/g*		*92.4*	*50-140*			
Surrogate: Toluene-d8	*8.39*		*ug/g*		*105*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Physical Characteristics									
% Solids	82.1	0.1	% by Wt.	85.4			4.0	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	*5.91*		*ug/g dry*	*ND*	*98.3*	*50-140*			
Surrogate: Dibromofluoromethane	*5.82*		*ug/g dry*	*ND*	*96.8*	*50-140*			
Surrogate: Toluene-d8	*6.43*		*ug/g dry*	*ND*	*107*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	10.5	0.50	ug/g	ND	105	50-140			
Benzene	3.55	0.02	ug/g	ND	88.7	60-130			
Bromodichloromethane	3.86	0.05	ug/g	ND	96.5	60-130			
Bromoform	4.68	0.05	ug/g	ND	117	60-130			
Bromomethane	3.06	0.05	ug/g	ND	76.5	50-140			
Carbon Tetrachloride	3.90	0.05	ug/g	ND	97.5	60-130			
Chlorobenzene	3.73	0.05	ug/g	ND	93.2	60-130			
Chloroform	4.28	0.05	ug/g	ND	107	60-130			
Dibromochloromethane	4.37	0.05	ug/g	ND	109	60-130			
Dichlorodifluoromethane	3.30	0.05	ug/g	ND	82.4	50-140			
1,2-Dichlorobenzene	4.56	0.05	ug/g	ND	114	60-130			
1,3-Dichlorobenzene	4.55	0.05	ug/g	ND	114	60-130			
1,4-Dichlorobenzene	4.38	0.05	ug/g	ND	110	60-130			
1,1-Dichloroethane	3.55	0.05	ug/g	ND	88.8	60-130			
1,2-Dichloroethane	3.81	0.05	ug/g	ND	95.3	60-130			
1,1-Dichloroethylene	4.47	0.05	ug/g	ND	112	60-130			
cis-1,2-Dichloroethylene	4.19	0.05	ug/g	ND	105	60-130			
trans-1,2-Dichloroethylene	3.94	0.05	ug/g	ND	98.6	60-130			
1,2-Dichloropropane	3.49	0.05	ug/g	ND	87.4	60-130			
cis-1,3-Dichloropropylene	3.89	0.05	ug/g	ND	97.2	60-130			
trans-1,3-Dichloropropylene	3.97	0.05	ug/g	ND	99.1	60-130			
Ethylbenzene	3.59	0.05	ug/g	ND	89.8	60-130			
Ethylene dibromide (dibromoethane	4.35	0.05	ug/g	ND	109	60-130			
Hexane	2.94	0.05	ug/g	ND	73.6	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.88	0.50	ug/g	ND	88.8	50-140			
Methyl Isobutyl Ketone	9.09	0.50	ug/g	ND	90.9	50-140			
Methyl tert-butyl ether	9.80	0.05	ug/g	ND	98.0	50-140			
Methylene Chloride	4.11	0.05	ug/g	ND	103	60-130			
Styrene	4.75	0.05	ug/g	ND	119	60-130			
1,1,1,2-Tetrachloroethane	4.12	0.05	ug/g	ND	103	60-130			
1,1,2,2-Tetrachloroethane	3.90	0.05	ug/g	ND	97.6	60-130			
Tetrachloroethylene	4.78	0.05	ug/g	ND	120	60-130			
Toluene	3.48	0.05	ug/g	ND	86.9	60-130			
1,1,1-Trichloroethane	3.64	0.05	ug/g	ND	90.9	60-130			
1,1,2-Trichloroethane	3.54	0.05	ug/g	ND	88.4	60-130			
Trichloroethylene	4.07	0.05	ug/g	ND	102	60-130			
Trichlorofluoromethane	3.75	0.05	ug/g	ND	93.7	50-140			
Vinyl chloride	3.65	0.02	ug/g	ND	91.3	50-140			
m,p-Xylenes	7.37	0.05	ug/g	ND	92.1	60-130			
o-Xylene	3.58	0.05	ug/g	ND	89.4	60-130			
Surrogate: 4-Bromofluorobenzene	*8.39*		*ug/g*		*105*	*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.

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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№ 106582

Page 1 of 1

Client Name: PATERSON GROUP	Project Reference: PE3693	TAT: [✓] Regular [ ] 3 Day	
Contact Name: ERIC LEVEQUE	Quote #	[ ] 2 Day [ ] 1 Day	
Address: 154 COLONNADE RD. S.	PO # 19116	Date Required:	
Telephone: 613-226-7381	Email Address: elevegue@patersongroup.ca		

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: 1550387

	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-S56	S		2	DEC 10 2015			✓								~ 120 mL + 1 vial				✓
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A. LECLERC	Received at Lab: CUNEYPORN DOKMAI
Relinquished By (Print):	Date/Time: 11/12/15 12:15 PM	Date/Time: DEC 11, 2015 01:43
Date/Time: DEC 11 2015	Temperature: ___ °C	Temperature: 15.8 °C

Verified By:
Date/Time: DEC 11/15 2:15
pH Verified [ ] By: RS

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

Client PO: 19205
Project: PE3693
Custody: 107002

Report Date: 16-Feb-2016
Order Date: 11-Feb-2016

Order #: 1607280

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

Paracel ID	Client ID
1607280-01	BH3-SS3

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 19205

Report Date: 16-Feb-2016
Order Date: 11-Feb-2016
Project Description: PE3693

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	11-Feb-16	12-Feb-16
Solids, %	Gravimetric, calculation	12-Feb-16	12-Feb-16

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 19205

Report Date: 16-Feb-2016
Order Date: 11-Feb-2016
Project Description: PE3693

	Client ID:	BH3-SS3	-	-	-
	Sample Date:	10-Feb-16	-	-	-
	Sample ID:	1607280-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	91.6	-	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	0.07	-	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Report Date: 16-Feb-2016

Client: Paterson Group Consulting Engineers

Order Date: 11-Feb-2016

Client PO: 19205

Project Description: PE3693

	Client ID:	BH3-SS3	-	-	-
	Sample Date:	10-Feb-16	-	-	-
	Sample ID:	1607280-01	-	-	-
	MDL/Units	Soil	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	0.77	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	87.2%	-	-	-
Dibromofluoromethane	Surrogate	90.8%	-	-	-
Toluene-d8	Surrogate	84.8%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane,	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*3.49*		*ug/g*		*109*	*50-140*			
Surrogate: Dibromofluoromethane	*3.88*		*ug/g*		*121*	*50-140*			
Surrogate: Toluene-d8	*3.18*		*ug/g*		*99.3*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Physical Characteristics									
% Solids	89.1	0.1	% by Wt.	90.8			1.9	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane,	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	*1.47*		*ug/g dry*	*ND*	*96.1*	*50-140*			
Surrogate: Dibromofluoromethane	*1.90*		*ug/g dry*	*ND*	*124*	*50-140*			
Surrogate: Toluene-d8	*1.33*		*ug/g dry*	*ND*	*86.8*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	9.17	0.50	ug/g	ND	91.7	50-140			
Benzene	2.92	0.02	ug/g	ND	73.1	60-130			
Bromodichloromethane	3.35	0.05	ug/g	ND	83.6	60-130			
Bromoform	4.87	0.05	ug/g	ND	122	60-130			
Bromomethane	3.64	0.05	ug/g	ND	90.9	50-140			
Carbon Tetrachloride	3.12	0.05	ug/g	ND	78.0	60-130			
Chlorobenzene	3.18	0.05	ug/g	ND	79.4	60-130			
Chloroform	3.02	0.05	ug/g	ND	75.5	60-130			
Dibromochloromethane	4.64	0.05	ug/g	ND	116	60-130			
Dichlorodifluoromethane	2.00	0.05	ug/g	ND	50.1	50-140			
1,2-Dichlorobenzene	3.16	0.05	ug/g	ND	79.1	60-130			
1,3-Dichlorobenzene	3.23	0.05	ug/g	ND	80.7	60-130			
1,4-Dichlorobenzene	3.20	0.05	ug/g	ND	80.1	60-130			
1,1-Dichloroethane	3.35	0.05	ug/g	ND	83.9	60-130			
1,2-Dichloroethane	3.29	0.05	ug/g	ND	82.2	60-130			
1,1-Dichloroethylene	2.86	0.05	ug/g	ND	71.5	60-130			
cis-1,2-Dichloroethylene	2.76	0.05	ug/g	ND	68.9	60-130			
trans-1,2-Dichloroethylene	2.86	0.05	ug/g	ND	71.5	60-130			
1,2-Dichloropropane	2.97	0.05	ug/g	ND	74.2	60-130			
cis-1,3-Dichloropropylene	3.81	0.05	ug/g	ND	95.2	60-130			
trans-1,3-Dichloropropylene	4.35	0.05	ug/g	ND	109	60-130			
Ethylbenzene	3.63	0.05	ug/g	ND	90.7	60-130			
Ethylene dibromide (dibromoethane,	3.70	0.05	ug/g	ND	92.5	60-130			
Hexane	2.45	0.05	ug/g	ND	61.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.09	0.50	ug/g	ND	80.9	50-140			
Methyl Isobutyl Ketone	7.44	0.50	ug/g	ND	74.4	50-140			
Methyl tert-butyl ether	5.92	0.05	ug/g	ND	59.2	50-140			
Methylene Chloride	3.07	0.05	ug/g	ND	76.6	60-130			
Styrene	3.09	0.05	ug/g	ND	77.2	60-130			
1,1,1,2-Tetrachloroethane	3.93	0.05	ug/g	ND	98.2	60-130			
1,1,2,2-Tetrachloroethane	4.62	0.05	ug/g	ND	116	60-130			
Tetrachloroethylene	3.06	0.05	ug/g	ND	76.5	60-130			
Toluene	3.32	0.05	ug/g	ND	82.9	60-130			
1,1,1-Trichloroethane	2.87	0.05	ug/g	ND	71.7	60-130			
1,1,2-Trichloroethane	3.34	0.05	ug/g	ND	83.5	60-130			
Trichloroethylene	2.72	0.05	ug/g	ND	67.9	60-130			
Trichlorofluoromethane	2.70	0.05	ug/g	ND	67.5	50-140			
Vinyl chloride	3.63	0.02	ug/g	ND	90.7	50-140			
m,p-Xylenes	6.54	0.05	ug/g	ND	81.8	60-130			
o-Xylene	3.41	0.05	ug/g	ND	85.3	60-130			
Surrogate: 4-Bromofluorobenzene	*2.71*		*ug/g*		*84.8*	*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.

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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№ 107002

Page 1 of 1

Client Name: PATERSON GROUP	Project Reference: PE3693	TAT: [X] Regular [ ] 3 Day
Contact Name: ERIC LEVEQUE	Quote #	[ ] 2 Day [ ] 1 Day
Address: 154 COLONNADE RD.	PO # 19205	Date Required:
Telephone: 613-226-7381	Email Address: elevequ e@patersongroup.ca	

Criteria: [X] 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: 1607280

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	BH3-SS3	S		2	Feb 10/16			X							120mL + Vial.					
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: M. DeLouse	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time: 11/02/16 3:35 PM	Date/Time: Feb 11/16 5:10	Date/Time: Feb 11/16 5:19
Date/Time:	Temperature: ____ °C	Temperature: 13.1 °C	pH Verified [X] By: NA

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

Client PO: 18955
Project: PE3693
Custody: 107549

Report Date: 18-Feb-2016
Order Date: 12-Feb-2016

Order #: 1607311

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

Paracel ID	Client ID
1607311-01	BH2 SS2

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 18955

Report Date: 18-Feb-2016
Order Date: 12-Feb-2016
Project Description: PE3693

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	11-Feb-16	17-Feb-16
Solids, %	Gravimetric, calculation	13-Feb-16	13-Feb-16

Certificate of Analysis

Report Date: 18-Feb-2016

Client: Paterson Group Consulting Engineers

Order Date: 12-Feb-2016

Client PO: 18955

Project Description: PE3693

	Client ID:	BH2 SS2	-	-	-
	Sample Date:	11-Feb-16	-	-	-
	Sample ID:	1607311-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	89.5	-	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Report Date: 18-Feb-2016

Client: Paterson Group Consulting Engineers

Order Date: 12-Feb-2016

Client PO: 18955

Project Description: PE3693

	Client ID:	BH2 SS2	-	-	-
	Sample Date:	11-Feb-16	-	-	-
	Sample ID:	1607311-01	-	-	-
	MDL/Units	Soil	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	96.4%	-	-	-
Dibromofluoromethane	Surrogate	95.6%	-	-	-
Toluene-d8	Surrogate	108%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*3.49*		*ug/g*		*109*	*50-140*			
Surrogate: Dibromofluoromethane	*3.88*		*ug/g*		*121*	*50-140*			
Surrogate: Toluene-d8	*3.18*		*ug/g*		*99.3*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Physical Characteristics									
% Solids	84.9	0.1	% by Wt.	85.0			0.1	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	*1.47*		*ug/g dry*	*ND*	*96.1*	*50-140*			
Surrogate: Dibromofluoromethane	*1.90*		*ug/g dry*	*ND*	*124*	*50-140*			
Surrogate: Toluene-d8	*1.33*		*ug/g dry*	*ND*	*86.8*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	9.17	0.50	ug/g	ND	91.7	50-140			
Benzene	2.92	0.02	ug/g	ND	73.1	60-130			
Bromodichloromethane	3.35	0.05	ug/g	ND	83.6	60-130			
Bromoform	4.87	0.05	ug/g	ND	122	60-130			
Bromomethane	3.64	0.05	ug/g	ND	90.9	50-140			
Carbon Tetrachloride	3.12	0.05	ug/g	ND	78.0	60-130			
Chlorobenzene	3.18	0.05	ug/g	ND	79.4	60-130			
Chloroform	3.02	0.05	ug/g	ND	75.5	60-130			
Dibromochloromethane	4.64	0.05	ug/g	ND	116	60-130			
Dichlorodifluoromethane	2.00	0.05	ug/g	ND	50.1	50-140			
1,2-Dichlorobenzene	3.16	0.05	ug/g	ND	79.1	60-130			
1,3-Dichlorobenzene	3.23	0.05	ug/g	ND	80.7	60-130			
1,4-Dichlorobenzene	3.20	0.05	ug/g	ND	80.1	60-130			
1,1-Dichloroethane	3.35	0.05	ug/g	ND	83.9	60-130			
1,2-Dichloroethane	3.29	0.05	ug/g	ND	82.2	60-130			
1,1-Dichloroethylene	2.86	0.05	ug/g	ND	71.5	60-130			
cis-1,2-Dichloroethylene	2.76	0.05	ug/g	ND	68.9	60-130			
trans-1,2-Dichloroethylene	2.86	0.05	ug/g	ND	71.5	60-130			
1,2-Dichloropropane	2.97	0.05	ug/g	ND	74.2	60-130			
cis-1,3-Dichloropropylene	3.81	0.05	ug/g	ND	95.2	60-130			
trans-1,3-Dichloropropylene	4.35	0.05	ug/g	ND	109	60-130			
Ethylbenzene	3.63	0.05	ug/g	ND	90.7	60-130			
Ethylene dibromide (dibromoethane	3.70	0.05	ug/g	ND	92.5	60-130			
Hexane	2.45	0.05	ug/g	ND	61.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.09	0.50	ug/g	ND	80.9	50-140			
Methyl Isobutyl Ketone	7.44	0.50	ug/g	ND	74.4	50-140			
Methyl tert-butyl ether	5.92	0.05	ug/g	ND	59.2	50-140			
Methylene Chloride	3.07	0.05	ug/g	ND	76.6	60-130			
Styrene	3.09	0.05	ug/g	ND	77.2	60-130			
1,1,1,2-Tetrachloroethane	3.93	0.05	ug/g	ND	98.2	60-130			
1,1,2,2-Tetrachloroethane	4.62	0.05	ug/g	ND	116	60-130			
Tetrachloroethylene	3.06	0.05	ug/g	ND	76.5	60-130			
Toluene	3.32	0.05	ug/g	ND	82.9	60-130			
1,1,1-Trichloroethane	2.87	0.05	ug/g	ND	71.7	60-130			
1,1,2-Trichloroethane	3.34	0.05	ug/g	ND	83.5	60-130			
Trichloroethylene	2.72	0.05	ug/g	ND	67.9	60-130			
Trichlorofluoromethane	2.70	0.05	ug/g	ND	67.5	50-140			
Vinyl chloride	3.63	0.02	ug/g	ND	90.7	50-140			
m,p-Xylenes	6.54	0.05	ug/g	ND	81.8	60-130			
o-Xylene	3.41	0.05	ug/g	ND	85.3	60-130			
Surrogate: 4-Bromofluorobenzene	*2.71*		*ug/g*		*84.8*	*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.

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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Ottawa, Ontario K1G 4J8
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Chain of Custody
(Lab Use Only)
№ 107549

Page 1 of 1

Client Name: Paterson Group.	Project Reference: PE3693	TAT: [X] Regular [ ] 3 Day
Contact Name: Eric Levesque	Quote #	[ ] 2 Day [ ] 1 Day
Address: 154 Colonnade Rd. S.	PO # 18955	Date Required:
Telephone: 613-226-7381	Email Address: ELEVESQUE@PATERSONGROUP.CA	

Criteria: [X] 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: 1607311

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	BH2 SS2	S		2	Feb. 11. 16	12PM.		X							120 mL +vial.				
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: Paracel.

Relinquished By (Sign):	Received by Driver/Depot: M. Skouse	Received at Lab:	Verified By:
Relinquished By (Print): Ryan Mathieson	Date/Time: 12/02/16 940 AM	Date/Time: Feb 12/16 11:50	Date/Time: Feb 12/16 12:13
Date/Time: Feb. 12. 16 / 8:37am.	Temperature: ___ °C	Temperature: 12.1 °C	pH Verified [X] By: AV4

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

Client PO: 19081
Project: PE3693
Custody: 26357

Report Date: 22-Dec-2015
Order Date: 16-Dec-2015

Order #: 1551219

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

Paracel ID	Client ID
1551219-01	BH1-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 19081

Report Date: 22-Dec-2015
Order Date: 16-Dec-2015
Project Description: PE3693

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	16-Dec-15	17-Dec-15

Certificate of Analysis

Report Date: 22-Dec-2015

Client: Paterson Group Consulting Engineers

Order Date: 16-Dec-2015

Client PO: 19081

Project Description: PE3693

	Client ID:	BH1-GW1	-	-	-
	Sample Date:	16-Dec-15	-	-	-
	Sample ID:	1551219-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	2.6	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	3.7	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	0.7	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	25.2	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	1.1	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	900	-	-	-
Toluene	0.5 ug/L	19.4	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 22-Dec-2015

Client: Paterson Group Consulting Engineers

Order Date: 16-Dec-2015

Client PO: 19081

Project Description: PE3693

	Client ID:	BH1-GW1	-	-	-
	Sample Date:	16-Dec-15	-	-	-
	Sample ID:	1551219-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	49.3	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	2.1	-	-	-
o-Xylene	0.5 ug/L	0.8	-	-	-
Xylenes, total	0.5 ug/L	2.9	-	-	-
4-Bromofluorobenzene	Surrogate	114%	-	-	-
Dibromofluoromethane	Surrogate	107%	-	-	-
Toluene-d8	Surrogate	106%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane	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	*89.2*		*ug/L*		*111*	*50-140*			
Surrogate: Dibromofluoromethane	*86.7*		*ug/L*		*108*	*50-140*			
Surrogate: Toluene-d8	*91.6*		*ug/L*		*115*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	123	5.0	ug/L	120			3.0	30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	20.4	5.0	ug/L	19.6			3.8	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*88.4*		*ug/L*	*ND*	*111*	*50-140*			
Surrogate: Dibromofluoromethane	*90.3*		*ug/L*	*ND*	*113*	*50-140*			
Surrogate: Toluene-d8	*91.4*		*ug/L*	*ND*	*114*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	87.2	5.0	ug/L	ND	87.2	50-140			
Benzene	37.5	0.5	ug/L	ND	93.8	60-130			
Bromodichloromethane	39.0	0.5	ug/L	ND	97.6	60-130			
Bromoform	45.8	0.5	ug/L	ND	115	60-130			
Bromomethane	37.6	0.5	ug/L	ND	94.0	50-140			
Carbon Tetrachloride	38.6	0.2	ug/L	ND	96.4	60-130			
Chlorobenzene	39.2	0.5	ug/L	ND	98.0	60-130			
Chloroform	37.7	0.5	ug/L	ND	94.4	60-130			
Dibromochloromethane	45.0	0.5	ug/L	ND	112	60-130			
Dichlorodifluoromethane	26.7	1.0	ug/L	ND	66.8	50-140			
1,2-Dichlorobenzene	44.1	0.5	ug/L	ND	110	60-130			
1,3-Dichlorobenzene	41.2	0.5	ug/L	ND	103	60-130			
1,4-Dichlorobenzene	41.2	0.5	ug/L	ND	103	60-130			
1,1-Dichloroethane	39.2	0.5	ug/L	ND	98.0	60-130			
1,2-Dichloroethane	37.3	0.5	ug/L	ND	93.3	60-130			
1,1-Dichloroethylene	40.0	0.5	ug/L	ND	100	60-130			
cis-1,2-Dichloroethylene	36.4	0.5	ug/L	ND	90.9	60-130			
trans-1,2-Dichloroethylene	42.6	0.5	ug/L	ND	106	60-130			
1,2-Dichloropropane	39.4	0.5	ug/L	ND	98.4	60-130			
cis-1,3-Dichloropropylene	37.9	0.5	ug/L	ND	94.7	60-130			
trans-1,3-Dichloropropylene	39.8	0.5	ug/L	ND	99.6	60-130			
Ethylbenzene	45.1	0.5	ug/L	ND	113	60-130			
Ethylene dibromide (dibromoethane	45.1	0.2	ug/L	ND	113	60-130			
Hexane	38.1	1.0	ug/L	ND	95.2	60-130			
Methyl Ethyl Ketone (2-Butanone)	89.6	5.0	ug/L	ND	89.6	50-140			
Methyl Isobutyl Ketone	101	5.0	ug/L	ND	101	50-140			
Methyl tert-butyl ether	99.5	2.0	ug/L	ND	99.5	50-140			
Methylene Chloride	37.3	5.0	ug/L	ND	93.2	60-130			
Styrene	46.0	0.5	ug/L	ND	115	60-130			
1,1,1,2-Tetrachloroethane	42.7	0.5	ug/L	ND	107	60-130			
1,1,2,2-Tetrachloroethane	37.5	0.5	ug/L	ND	93.7	60-130			
Tetrachloroethylene	51.4	0.5	ug/L	ND	129	60-130			
Toluene	41.9	0.5	ug/L	ND	105	60-130			
1,1,1-Trichloroethane	38.4	0.5	ug/L	ND	95.9	60-130			
1,1,2-Trichloroethane	36.9	0.5	ug/L	ND	92.3	60-130			
Trichloroethylene	41.2	0.5	ug/L	ND	103	60-130			
Trichlorofluoromethane	38.6	1.0	ug/L	ND	96.6	60-130			
Vinyl chloride	27.9	0.5	ug/L	ND	69.8	50-140			
m,p-Xylenes	88.7	0.5	ug/L	ND	111	60-130			
o-Xylene	43.9	0.5	ug/L	ND	110	60-130			
Surrogate: 4-Bromofluorobenzene	*84.1*		*ug/L*		*105*	*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.

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Chain of Custody
(Lab Use Only)
№ 26357

Page 1 of 1

Client Name: PATERSON GROUP	Project Reference: PE3693	TAT: [X] Regular [ ] 3 Day
Contact Name: ERIC LEVEQUE	Quote #	[ ] 2 Day [ ] 1 Day
Address: 154 COLONNADE RD	PO # 19061	Date Required:
Telephone: 613-226-7301	Email Address: elevegue@patersongroup.ca	

Criteria: [X] 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: 1551219

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	~~Hydrocarbons~~	VOC
1	BH1-GW1	GW		~~3~~ 2	Dec 16/15	Am	~~X~~	X
2								
3								
4								
5								
6								
7								
8								
9								
10								

Comments: ~~Metals, Hydrides~~, TEST VOC on REGULAR

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: CSUNEEPARN 0011MA	Verified By:
Relinquished By (Print):	Date/Time: 16/12/15 4:00 PM	Date/Time: DEC 16, 2015 05:13	Date/Time: Dec 16/15 5:20
Date/Time:	Temperature: ___ °C	Temperature: 14.1 °C	pH Verified [X] By: N/A

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

Client PO: 18958
Project: PE3693
Custody: 107551

Report Date: 23-Feb-2016
Order Date: 18-Feb-2016

Order #: 1608189

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

Paracel ID	Client ID
1608189-01	BH3-GW1

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 23-Feb-2016

Client: Paterson Group Consulting Engineers

Order Date: 18-Feb-2016

Client PO: 18958

Project Description: PE3693

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	18-Feb-16	19-Feb-16

Certificate of Analysis

Report Date: 23-Feb-2016

Client: Paterson Group Consulting Engineers

Order Date: 18-Feb-2016

Client PO: 18958

Project Description: PE3693

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	17-Feb-16	-	-	-
	Sample ID:	1608189-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	52.0	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	80.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 23-Feb-2016

Client: Paterson Group Consulting Engineers

Order Date: 18-Feb-2016

Client PO: 18958

Project Description: PE3693

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	17-Feb-16	-	-	-
	Sample ID:	1608189-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	152	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	3.3	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	88.8%	-	-	-
Dibromofluoromethane	Surrogate	109%	-	-	-
Toluene-d8	Surrogate	102%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane	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	*71.3*		*ug/L*		*89.2*	*50-140*			
Surrogate: Dibromofluoromethane	*93.3*		*ug/L*		*117*	*50-140*			
Surrogate: Toluene-d8	*82.1*		*ug/L*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	1.97	0.5	ug/L	ND			200.0	30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	5.40	0.5	ug/L	ND			200.0	30	
Dibromochloromethane	0.87	0.5	ug/L	ND			200.0	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*70.2*		*ug/L*	*ND*	*87.8*	*50-140*			
Surrogate: Dibromofluoromethane	*86.3*		*ug/L*	*ND*	*108*	*50-140*			
Surrogate: Toluene-d8	*82.1*		*ug/L*	*ND*	*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	134	5.0	ug/L	ND	134	50-140			
Benzene	43.6	0.5	ug/L	ND	109	50-140			
Bromodichloromethane	38.5	0.5	ug/L	ND	96.2	50-140			
Bromoform	32.3	0.5	ug/L	ND	80.6	50-140			
Bromomethane	20.5	0.5	ug/L	ND	51.3	50-140			
Carbon Tetrachloride	24.8	0.2	ug/L	ND	62.1	50-140			
Chlorobenzene	34.1	0.5	ug/L	ND	85.2	50-140			
Chloroform	41.8	0.5	ug/L	ND	104	50-140			
Dibromochloromethane	33.0	0.5	ug/L	ND	82.5	50-140			
Dichlorodifluoromethane	23.1	1.0	ug/L	ND	57.8	50-140			
1,2-Dichlorobenzene	33.7	0.5	ug/L	ND	84.2	50-140			
1,3-Dichlorobenzene	30.4	0.5	ug/L	ND	76.1	50-140			
1,4-Dichlorobenzene	30.4	0.5	ug/L	ND	76.1	50-140			
1,1-Dichloroethane	48.5	0.5	ug/L	ND	121	50-140			
1,2-Dichloroethane	45.8	0.5	ug/L	ND	114	50-140			
1,1-Dichloroethylene	33.2	0.5	ug/L	ND	83.1	50-140			
cis-1,2-Dichloroethylene	32.8	0.5	ug/L	ND	81.9	50-140			
trans-1,2-Dichloroethylene	36.2	0.5	ug/L	ND	90.5	50-140			
1,2-Dichloropropane	39.3	0.5	ug/L	ND	98.2	50-140			
cis-1,3-Dichloropropylene	29.4	0.5	ug/L	ND	73.5	50-140			
trans-1,3-Dichloropropylene	22.2	0.5	ug/L	ND	55.5	50-140			
Ethylbenzene	47.8	0.5	ug/L	ND	119	50-140			
Ethylene dibromide (dibromoethane	41.5	0.2	ug/L	ND	104	50-140			
Hexane	32.5	1.0	ug/L	ND	81.2	50-140			
Methyl Ethyl Ketone (2-Butanone)	102	5.0	ug/L	ND	102	50-140			
Methyl Isobutyl Ketone	100	5.0	ug/L	ND	100	50-140			
Methyl tert-butyl ether	59.8	2.0	ug/L	ND	59.8	50-140			
Methylene Chloride	36.1	5.0	ug/L	ND	90.2	50-140			
Styrene	49.0	0.5	ug/L	ND	123	50-140			
1,1,1,2-Tetrachloroethane	31.1	0.5	ug/L	ND	77.6	50-140			
1,1,2,2-Tetrachloroethane	42.4	0.5	ug/L	ND	106	50-140			
Tetrachloroethylene	35.3	0.5	ug/L	ND	88.2	50-140			
Toluene	45.3	0.5	ug/L	ND	113	50-140			
1,1,1-Trichloroethane	31.0	0.5	ug/L	ND	77.6	50-140			
1,1,2-Trichloroethane	41.1	0.5	ug/L	ND	103	50-140			
Trichloroethylene	38.7	0.5	ug/L	ND	96.6	50-140			
Trichlorofluoromethane	29.9	1.0	ug/L	ND	74.8	50-140			
Vinyl chloride	30.4	0.5	ug/L	ND	76.0	50-140			
m,p-Xylenes	82.4	0.5	ug/L	ND	103	50-140			
o-Xylene	50.6	0.5	ug/L	ND	127	50-140			
Surrogate: 4-Bromofluorobenzene	*62.9*		*ug/L*		*78.6*	*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.

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Chain of Custody
(Lab Use Only)
№ 107551

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE3693	TAT: [X] Regular [ ] 3 Day
Contact Name: Eric Levesque	Quote #	[ ] 2 Day [ ] 1 Day
Address: 154 Colonnade Rd. S.	PO # 18958	Date Required:
Telephone: 613-226-7381	Email Address: elevesque@patersongroup.ca	

Criteria: [X] 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: 1608189

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH3-GW1	GW		2	Feb. 17. 16	2:36pm		X					
2													
3													
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: M. Dedouse	Received at Lab:	Verified By:
Relinquished By (Print): Ryan Matheson	Date/Time: 18/02/16 3:15pm	Date/Time: Feb 18/16 5:10	Date/Time: Feb 18/16 5:15
Date/Time: Feb. 18. 2016 / 9:23 am.	Temperature: ____ °C	Temperature: 13.1 °C	pH Verified [X] By: NA