Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

patersongroup

Modified Phase I - Environmental Site Assessment

Vacant Property
288 Booth Street
Ottawa, Ontario

Prepared For:

Peter Evans

Paterson Group Inc.
Consulting Engineers
28 Concourse Gate - Unit 1
Ottawa (Nepean), Ontario
Canada K2E 7T7

Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

July 25, 2011

Report: PE2328-1

TABLE OF CONTENTS

PAGE

APPENDICES

EXECUTIVE SUMMARY

Assessment

A Modified Phase I - Environmental Site Assessment was carried out for the vacant property located at the Civic address 288 Booth Street, in the City of Ottawa, Ontario. The purpose of this environmental assessment was to research the past and current use of the site and adjacent properties and identify any environmental concerns with the potential to have impacted the subject property.

The historical research indicated that the subject site has been used for commercial and residential purposes since at least 1910. The subject site is currently listed as 288 Booth Street but has historically been listed as 801-813 Somerset Street West and 288 -292 Booth Street. A dry cleaners was identified on the southeast portion of the site from 1966 to 1973. It is not known whether this location was used as a drop off facility or if dry cleaning activities were actually conducted on the site. None of the other uses of the subject site identified were considered to pose an environmental concern. The subject site has been vacant since at least 2008. A former dry cleaners was located approximately 35 m to the east of the subject site between 1944 and 1965. The historical use of the subject site as a dry cleaners and, to a lesser extent, the former dry cleaners to the east were considered to have had the potential to have impacted the subject site.

Following the historical review, a site visit was conducted. The site is currently vacant and is barricaded by concrete blocks so that it may no longer be used as a parking lot. Adjacent properties are used for residential are commercial purposes. No environmental concerns were identified with the current use of the subject site or adjacent properties.

A geotechnical investigation was completed for the site in conjunction with the Phase I - ESA. Practical auger refusal on inferred bedrock was encountered between depths of 2.5 m and 3.1 m. One soil sample was submitted for analytical testing of metals and volatile organic compounds (VOCs). Low concentrations of various metals parameters were identified in the submitted soil sample which are in compliance with the current MOE Table 3 standards for the subject site. No detectable VOC concentrations were identified in the soil sample analysed. All of the soil samples analyzed are in compliance with the current MOE Table 3 standards.

One groundwater sample was recovered from the monitoring well installed in BH3 and submitted for analytical testing of volatile organic compounds (VOCs). The parameters acetone, chloroform and trichlorofluoromethane were detected in the groundwater sample submitted for testing. The acetone and trichlorofluoromethane were detected in low concentrations that are in compliance with the MOE Table 3 standards. The chloroform concentration detected, 9.6 µg/L, slightly exceeds the MOE Table 3 standard. Chlorinated municipal water generally contains chloroform concentrations ranging from 10 µg/L to 20 µg/L. The chloroform identified is expected to be the result of the municipal water that was used for the drill coring process and contains lower concentrations of chloroform than those typically associated with municipal water. Based on the expected source of the chloroform, it is not considered to be a concern for the site.

Based on field observations and the analytical test results, in our opinion the site has not been contaminated by the historical use of the dry cleaners on the subject site or on the property further to the east. **No further investigation is recommended.**

Recommendations

Groundwater Monitoring Well

The groundwater monitoring well installed in BH3 should be properly abandoned by a licensed well driller, if it is not going to be used in the future.

1.0 INTRODUCTION

At the request of Mr. Peter Evans, Paterson Group conducted a modified Phase I - Environmental Site Assessment (ESA) of the vacant property located at 288 Booth Street, in the City of Ottawa, Ontario.

This report has been prepared specifically and solely for the above noted project which is described herein. It contains all of our findings and results of the environmental conditions at this site.

2.0 SITE INFORMATION

Address:	288 Booth Street, Ottawa, Ontario.
Location:	Located at the north west corner of the intersection between Somerset Street West and Booth Street in the City of Ottawa, Ontario. Refer to Figure 1 - Key Plan in the appendix for the site location.
Site Description:	
Configuration/Size:	Irregular, lot area of approximately 728 m^2
Legal Description:	Lot 83 and Part of Lot 82 on Registered Plan 13, in the City of Ottawa.
Site Co-ordinates:	45° 24' 34" N; 75° 42' 39" W
Current Use:	The subject site is currently vacant.
Services:	The subject site is located in a municipally serviced neighbourhood.

3.0 SCOPE OF WORK

The scope of work for this modified Phase I - Environmental Site Assessment was as follows:

- ❑ Investigate the existing conditions present at the subject property by carrying out a field study and historical review in accordance with CSA Z768-01.
- ❑ Install a monitoring well in a geotechnical borehole and carry out a limited testing program.
- ❑ Present the results of our findings in a comprehensive report.
- ❑ Provide a preliminary environmental site evaluation based on our findings.
- ❑ Provide preliminary remediation recommendations and further investigative work if contamination is encountered or suspected.

4.0 METHOD OF INVESTIGATION

4.1 Historical Research

The methodology for the Phase I - Environmental Site Assessment program was carried out in two segments. The first consisted of a historical review which included a brief research of the past use of the site. This portion of the program was carried out by personnel from our environmental division. The following is a list of the key information sources reviewed by this firm.

Federal Records

- ❑ Air photos at the Energy Mines and Resources Air Photo Library.
- ❑ National Archives.
- ❑ Maps and photographs (Geological Survey of Canada surficial and subsurface mapping).
- ❑ National PCB Registry.

Provincial Records

- ❑ MOE document titled “Waste Disposal Site Inventory in Ontario”.
- ❑ MOE Brownfield Registration Database website.
- ❑ Office of Technical Standards and Safety Authority, Fuels Safety Branch.
- ❑ MOE Freedom of Information request.

Municipal Records

- ❑ City of Ottawa document entitled “Old Landfill Management Strategy; Phase 1 - Identification of Sites, City of Ottawa, Ontario”; finalised October 2004.
- ❑ Intera Technologies Limited Report “Mapping and Assessment of Former Industrial Sites, City of Ottawa.

Local Information Sources

- ❑ Previous Engineering Reports
- ❑ Geotechnical Investigation

4.2 Field Assessment

The second segment of the assessment consisted of a field investigation which included a walk-through inspection and detailed visual assessment of the environmental conditions of the subject property. The field investigation was carried out on June 20, 2011, by personnel from our Environmental Division.

As part of the field assessment, the site was inspected for signs of the following:

- ❑ Evidence of previous or existing fuel storage tanks.
- ❑ On-site use or storage of hazardous materials.
- ❑ On-site handling or disposal of liquid or solid waste materials.
- ❑ Aboveground piping systems, including pumps, valves, and joints.
- ❑ Truck or rail loading or unloading areas.
- ❑ Electrical conduits, abandoned pipelines or pumping stations.
- ❑ Remnants of old buildings.
- ❑ Signs of surficial contamination (ie: staining, distressed vegetation).
- ❑ Unnaturally discoloured, ponded, or flowing waters.
- ❑ Surficial drainage, wetlands, natural waterways, or watercourses through the property (ie: ditches, creeks, ponds, poor drainage).
- ❑ Any evidence of potable water supply wells or groundwater monitoring wells (such as leak detection monitoring wells for underground storage tank systems or abandoned systems).
- ❑ Any abnormal odours associated with the site, whether from on-site or off-site sources.
- ❑ The presence of any recent soil disturbances such as soil removal, filling, tilling, grading, etc.
- ❑ Asbestos containing materials (ACMs).
- ❑ Products containing Polychlorinated Biphenyls (PCBs).
- ❑ Ozone depleting substances (ODS).
- ❑ Lead-containing materials.
- ❑ Current use of neighbouring properties.

5.0 FINDINGS OF THE ENVIRONMENTAL ASSESSMENT

5.1 Historical Review

Air Photo Research

Historical air photos, from the national air photo library, were reviewed for the subject property and adjacent sites. A summary of our findings is presented below.

1922 The subject property is occupied by a commercial/residential building. Somerset Street and Booth Street border the property to the south and east, respectively. The adjacent properties and neighbouring properties also appear to be used for commercial and/or residential purposes. A railway line is present further to the west (west of Preston Street) of the subject site.

1950 The building which is currently used as a garage at 297 Booth Street is now present to the south east of the subject site. Otherwise no significant changes have been made to the subject site or surrounding properties.

1958 No significant changes appear to have been made to the subject site or neighbouring properties.

1969 A building to the south of the subject site, located at the north west corner of the intersection between Eccles Street and Booth Street, has been removed and the property is now vacant. Otherwise no significant changes have been made to the subject site or neighbouring properties.

1984 It appears as though the west portion of the building on the adjacent property to the west has been removed, opening up an access lane from Somerset Street to the rear of the building. Otherwise no significant changes have been made to the subject site or neighbouring properties.

1992 No significant changes appear to have been made to the subject site or neighbouring properties.

2002 (City of Ottawa Website) No significant changes appear to have been made to the subject site or adjacent properties.

2008 (City of Ottawa Website) The building on the subject site has been removed. The subject site is now vacant and appears to be used for vehicular parking. No significant changes were made to the neighbouring properties.

Laser copies of some of the aerial photographs are included in Appendix 2 of this report.

National Archives

The Ottawa city directories from 1910 to 2000 were reviewed (at approximate ten year intervals) for the area of the subject site. The subject site has been used for commercial and residential purposes since at least 1910. The subject site is currently listed as 288 Booth Street but has historically been listed as 801-813 Somerset Street West and 288-292 Booth Street. The historical uses of the subject site are outlined below in Table 1.

Table 1 - Summary of Historical Use of Subject Site
1910-2000

Use and Years Observed	Address
Season's Pizza (2000) Edna's Confecionary (1960's to 1970s) Larmac Tile and Building Supply (1950s) Primrose Realty Co. (1940s) Duern and Mcphail Upholstery (1930s) Shoe Repair (1920s)	288 Booth Street
Residential Use (2000s) Regal Apartments (1920s to 1990s)	290 Booth Street
Asia Market (2000s) NuCreation Fashion (1990s) Rexy Shoe Store (1974 to 1980s) Spic and Span Cleaners (1966 to 1973) Royal Bank of Canada (1920s to 1964)	801 Somerset Street West
Residential Dwelling (1910 to 1940)	803 Somerset Street West
Hygiene Products Ltd (1940s) Pharmacy (1920s to 1930s) O'Keefe Brewery (1909 to 1912)	805 Somerset Street West
Mai Mai Unisex Beauty (2000s) Regal Apartments (1920's to 1990s)	807 Somerset Street West
Madina Food Mart (2000s)	809 Somerset Street West
Club Vietnamese and Restaurant (2000s) Regal Apartments (1920's to 1990s)	811 Somerset Street West

The historical use of 801 Somerset Street West, located in the southeast corner of the subject site, as a Dry Cleaners poses a potential environmental risk. It is not known whether this location was used as a drop off facility or if dry cleaning activities were actually conducted on the site. There are no other concerns with the historical use of the subject site.

The neighbouring properties have primarily been used for commercial and residential purposes since at least 1910. The historical uses of the neighbouring properties which are of potential concern are outlined below in Table 2. For orientation purposes assume Booth Street runs North - South.

Table 2 - Summary of Ottawa city directories 1951-2000

Business	Location	Distance to Site	Orientation to site	Years observed
Dry Cleaners	789 Somerset Street West	35 m	East	1944-1965
Printers	787 Somerset Street West	40 m	East	1967-1974
Automotive garage	297 Booth Street	40 m	Southeast	1948 - Present
Automotive garage	115 Rochester Street	40 m	West	1950 - Present
Printers	777A Somerset Street West	70 m	East	1986 - 1994
Dry Cleaners	304 Booth Street	70 m	South	circa 1937 - 1962
Dry Cleaners	313 Booth Street	90 m	Southeast	circa 1920 - 1936

The inferred direction of groundwater flow in this area is to the northwest. The closest properties of concern are located a significant distance away from the subject site, between 35 m and 40 m, and are cross-gradient based on the inferred direction of groundwater flow. As such the automotive garage and former printers are not considered to have significant potential to have impacted the subject site. The former dry cleaners at 789 Somerset Street West is considered to have a low potential to have impacted the subject site based on the distance from the subject site and the period of operation.

The other above-noted businesses, which are located significant distances of 70 m or greater away from the subject site, are not considered to have significant potential to have impacted the subject site site.

Fire Insurance Plans (FIPs) from 1956 identified Regal Apartments on the subject property. The adjacent properties to the north and west of the subject site are also occupied by residential buildings. The garage at 297 Booth is present with one underground storage tank (UST). The garage at 115 Rochester Street and the dry cleaners at 304 Booth Street are also present. These properties were previously discussed and do not pose a significant environmental concern.

Three (3) gasoline service stations, with two or more underground storage tanks, were observed at 148 Rochester Street, 770 Somerset Street West and 896 Somerset Street West. These properties are located approximately 115 m, 125 m and 215 m away from the subject site, respectively. These facilities are not expected to have impacted the site given their distance and inferred cross-gradient orientation with respect to the subject site.

Natural Resources Canada (NRCAN)

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 interbedded limestone and shale of the Verulam Formation. Based on the maps, the thickness of overburden ranges from 0 m to 1 m.

National PCB Inventory

The document prepared by the Canadian Council of Resource and Environment Ministers, entitled "*National Inventory of PCB Waste Storage Sites*", dated 1988 was reviewed. No PCB storage sites were identified within 500 m of subject site.

Technical Standards and Safety Authority (TSSA)

The Technical Standards and Safety Authority (TSSA), Fuels Safety Branch, was contacted on June 21, 2011 as part of this assessment. The response from the TSSA indicated that there are no records of any fuel storage tanks recorded in the TSSA registry for the subject property. No neighbouring properties are registered with the TSSA.

Ontario Ministry of Environment (MOE)

A search of the MOE brownfields environmental site registry was conducted electronically on June 27, 2011. A Record of Site Condition has been filed for a property located at 314 Booth Steet, approximately 90 m to the south of the subject site. The RSC was required because of a zoning change from commercial to residential land use. A Phase I - Environmental Site Assessment (Phase I - ESA) was completed on the subject site in 2009. It does not appear as though a Phase II - ESA was recommended as there are no analytical test results for soil or groundwater. Based on this information the property at 314 Booth Street is not a concern.

An RSC has also been filed for the property located at 130 Rochester Street approximately 95 m to the west of the subject site. A Phase II - ESA and Test Pit Program were completed for the property in 2003 and 2004, respectively. All of the soil from the subject site was removed down to the bedrock surface in preparation for the site development. The analytical results from the Phase II - ESA indicated that trace levels of some contaminants of concern were detected that are in compliance with the MOE criteria for the site. Given the analytical results and the distance from the subject site, the property at 130 Rochester Street is not a concern.

No other RSCs have been filed within 500 m of the subject site.

A requisition form was sent to the MOE requesting a search into regulatory infractions, legal undertakings against the property, spill occurrences, existing waste generator numbers, and waste registrations at the subject property and neighbouring sites. The response from the MOE indicated that there were no records with respect to the subject site.

The Ontario Ministry of Environment document entitled “Waste Disposal Site Inventory in Ontario, 1991" was reviewed as part of the historical research. This document includes all recorded active and closed waste disposal sites, industrial manufactured gas plants, and coal tar distillation plants in the Province of Ontario. Based on this document, there are no former or current waste disposal sites or above mentioned industrial sites within a 500 m of the subject property.

City of Ottawa Landfill Document

The document prepared by Golder Associates entitled “Old Landfill Management Strategy, Phase I - Identification of Sites, City of Ottawa”, was reviewed. No landfill sites were identified within an 800 m radius of the subject property.

Former Industrial Sites

The report titled “Mapping and Assessment of Former Industrial Sites, City of Ottawa” prepared by Intera Technologies Limited was reviewed. The Intera report indicated the presence of five (5) former industrial sites within 500 m of the subject site, as presented in Table 3.

Table 3
Former Industrial Sites

Site No.	Location	Types of Industry	Period of Operation	Approx. Distance from Subject Site
48	161 Arthur Street	Printers	1928-1960	350 m to southeast
49	187 Preston Street	Leather Tannery	c1890-c1905	375 m to southwest
45	145 Spruce Street	Printers and Binders	1927-1940	250 m to south
46	145 Spruce Street	Primary Metal Industry	1940-1960	275 m to southwest
65	542 Wellington Street	Paint and Varnish Industry	c1900-1967	430 m to northeast

The above sites are not considered to have had the potential to impact to the subject site based on a combination of the distance from the subject site and the inferred direction of groundwater flow.

Previous Engineering Reports

Paterson has completed previous environmental investigations in the general vicinity of the subject site. A review of our files did not reveal any significant environmental concerns with respect to the subject site.

5.2 Exterior Assessment

Site

The subject site is currently vacant and is barricaded by concrete blocks so that it may not be used for parking. The subject site is relatively flat and is at grade with the neighbouring properties. Somerset Street West slopes down to the west beginning at Booth Street. The overall regional topography slopes down to the northwest. Site drainage consists of infiltration and sheet drainage to catch basins located on the surrounding city streets. The site surface is predominantly covered in gravel with the except of the northwest corner which is paved. Some surficial staining of the paved area formerly used for vehicle parking was noted in the northwest corner of the site. Some remnants of what appear to be the former building walls were noted along the east property boundary.

Potential Environmental Concerns

- **Fuels and Chemical Storage**

  There were no ASTs or signs indicating the possible presence of USTs observed at the time of assessment.

- **Waste Management**

  No waste is currently being generated on site

- **PCBs**

  No concerns were identified with respect to PCBs

5.3 Adjacent Properties

Land use adjacent to the subject site is as follows:

- North residential dwellings;
- South Somerset Street West followed by commercial retail;
- East Booth Street followed by commercial retail and residential dwellings;
- West Commercial retail.

The current use of the adjacent properties does not pose a significant environmental concern to the subject site. Land use adjacent to the subject site is illustrated on Drawing PE2328-1 - Test Hole Location Plan in Appendix 2.

5.4 Analytical Testing

A subsurface investigation was conducted for geotechnical purposes on July 8, 2011, and consisted of placing four (4) boreholes on the subject property. To assess any potential impact to the groundwater from the former dry cleaners, a monitoring well was installed to a depth of 7.0 m in Borehole 3 (BH3). The borehole locations are illustrated on Drawing PE2328-1-Test Hole Location Plan in Appendix 2. The boreholes were completed with a truck-mounted drill rig under full time supervision by Paterson personnel.

In general, the soil profile consisted of a layer of asphaltic concrete or gravel overlying sand and gravel fill followed by glacial till overlying limestone bedrock. Practical auger refusal on inferred bedrock was encountered between depths of 2.5 m and 3.1 m. The fill depths ranged from 0.7 m to 3.0 m below ground surface. Some fill material containing demolition debris such as pieces of brick and asphaltic concrete was encountered in the borehole located in the northwest portion of the site (BH1) at depths between 0.1 m and 0.6 m. A thin layer of darker fill material was also observed in BH3 and a sample of this material was submitted for analytical testing of metals. No other signs of potential contaminants were observed in the soil samples

Remediation Standards

The remediation standards for the subject site 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" (EPA), prepared by the Ontario Ministry of Environment (MOE), July 27, 2009. The MOE Table 3 standards are based on the following considerations:

- ❑ Coarse grained soil conditions.
- ❑ Surface soil and groundwater conditions.
- ❑ Non-potable groundwater situation.
- ❑ Residential land use.

Soil

One (1) soil sample was submitted for laboratory analysis of metals and volatile organic compounds (VOCs). The results of the analytical testing and the selected remediation standards are presented in Table 4 and Table 5. The laboratory reports are included in Appendix 1 of this report.

Table 4
Analytical Test Results - Soil
Metals

Parameter	MDL (µg/g)	Soil Sample (µg/g) July 8, 2011	Table 3 Standards Residential Property Use (µg/g)
		BH3 - SS5	
Antimony	1	1	7.5
Arsenic	1	10	18
Barium	1	113	390
Beryllium	0.5	nd	4
Boron (total)	5	16.4	120
Cadmium	0.5	0.6	1.2
Chromium	5	44	160
Cobalt	1	6	22
Copper	5	41	140
Lead	1	92	120
Molybdenum	1	3	6.9
Nickel	5	33	100
Selenium	1	2	2.4
Silver	0.3	1.2	20
Thallium	1	nd	1
Uranium	1	nd	23
Vanadium	10	25	86
Zinc	20	193	340

Notes:
- ❑ MDL - Method Detection Limit
- ❑ nd - not detected above the MDL

Table 5
Analytical Test Results - Soil
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/g)	Soil Sample (µg/g) July 8, 2011	Table 3 Standards Residential Property Use (µg/g)
		BH3 - SS5	
Acetone	0.5	nd	16
Benzene	0.02	nd	0.21
Bromodichloromethane	0.05	nd	13
Bromoform	0.05	nd	0.27
Bromomethane	0.05	nd	0.05
Carbon Tetrachloride	0.05	nd	0.05
Chlorobenzene	0.05	nd	2.4
Chloroethane	0.05	nd	N/V
Chloroform	0.05	nd	0.05
Chloromethane	0.2	nd	N/V
Dibromochloromethane	0.05	nd	9.4
Dichlorodifluoromethane	0.05	nd	16
1,2-Dibromoethane	0.05	nd	N/V
1,2-Dichlorobenzene	0.05	nd	3.4
1,3-Dichlorobenzene	0.05	nd	4.8
1,4-Dichlorobenzene	0.05	nd	0.083
1,1-Dichloroethane	0.05	nd	3.5
1,2-Dichloroethane	0.05	nd	0.05
1,1-Dichloroethylene	0.05	nd	0.05
cis-1,2-Dichloroethylene	0.05	nd	3.4
trans-1,2-Dichloroethylene	0.05	nd	0.084
1,2-Dichloroethylene, total	0.05	nd	N/V
1,2-Dichloropropane	0.05	nd	0.05

Table 5 (continued)
Analytical Test Results - Soil
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/g)	Soil Sample (µg/g) July 8, 2011	Table 3 Standards Residential Property Use (µg/g)
		BH3 - SS5	
cis-1,3-Dichloropropylene	0.05	nd	N/V
trans-1,3-Dichloropropylene	0.05	nd	N/V
1,3-Dichloropropene, total	0.05	nd	0.05
1,4-Dioxane	0.05	nd	1.8
Ethylbenzene	0.05	nd	3
Hexane	0.05	nd	2.8
Methyl Ethyl Ketone	0.5	nd	16
Methyl Butyl Ketone	2	nd	N/V
Methyl Isobutyl Ketone	0.5	nd	1.7
Methyl tert-Butyl Ether (MTBE)	0.05	nd	0.75
Methylene Chloride	0.05	nd	0.1
Styrene	0.05	nd	0.7
1,1,1,2-Tetrachloroethane	0.05	nd	0.058
1,1,2,2-Tetrachlorethane	0.05	nd	0.05
Tetrachloroethylene	0.05	nd	0.28
Toluene	0.05	nd	2.3
1,1,1-Trichloroethane	0.05	nd	0.38
1,1,2-Trichloroethane	0.05	nd	0.05
Trichloroethylene	0.05	nd	0.061
Trichlorofluoromethane	0.05	nd	54
1,3,5-Trimethylbenzene	0.05	nd	N/V
Vinyl Chloride	0.02	nd	0.02

Table 5 (continued)
Analytical Test Results - Soil
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/g)	Soil Sample (µg/g) July 8, 2011	Table 3 Standards Residential Property Use (µg/g)
		BH3 - SS5	
Xylenes	0.05	nd	3.1

Notes:
- ❑ MDL - Method Detection Limit
- ❑ nd - not detected above the MDL
- ❑ N/V - no value provided by the MOE

Low concentrations of various metals parameters were identified in the submitted soil sample which are in compliance with the MOE Table 3 standards for the subject site. No detectable VOC concentrations were identified in the soil sample analysed. All of the analytical results are in compliance with the current MOE Table 3 standards.

Groundwater

Paterson was on the subject site on July 13, 2011 to measure the ground water level and sample the monitoring well installed in BH3. The groundwater level was measured at 2.5 m below ground surface. It should be noted that groundwater levels are subject to seasonal fluctuations.

One groundwater sample was recovered from the monitoring well installed in BH3 and submitted for analytical testing of volatile organic compounds (VOCs). The results of the analytical testing and the selected remediation standards are presented in Table 6. The laboratory reports are included in Appendix 1 of this report.

Table 6
Analytical Test Results - Groundwater
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/L)	Groundwater Sample (µg/L) July 13, 2011	Table 3 Non-Potable Groundwater
		BH 3-GW1	
Acetone	5	175	130000
Benzene	0.5	nd	44
Bromodichloromethane	0.5	nd	85000
Bromoform	0.5	nd	380
Bromomethane	0.5	nd	5.6
Carbon Tetrachloride	0.2	nd	0.79
Chlorobenzene	0.5	nd	630
Chloroethane	1	nd	N/V
Chloroform	0.5	**9.6**	2.4
Chloromethane	3	nd	N/V
Dibromochloromethane	0.5	nd	82000
Dichlorodifluoromethane	1	nd	4400
1,2-Dibromoethane	0.2	nd	N/V
1,2-Dichlorobenzene	0.5	nd	4600
1,3-Dichlorobenzene	0.5	nd	9600
1,4-Dichlorobenzene	0.5	nd	8
1,1-Dichloroethane	0.5	nd	320
1,2-Dichloroethane	0.5	nd	1.6
1,1-Dichloroethylene	0.5	nd	1.6
cis-1,2-Dichloroethylene	0.5	nd	1.6
trans-1,2-Dichloroethylene	0.5	nd	1.6
1,2-Dichloroethylene, total	0.5	nd	N/V
1,2-Dichloropropane	0.5	nd	16
cis-1,3-Dichloropropylene	0.5	nd	N/V

Table 6 (continued)
Analytical Test Results - Groundwater
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/L)	Groundwater Sample (µg/L) July 13, 2011	Table 3 Non-Potable Groundwater
		BH 3-GW1	
trans-1,3-Dichloropropylene	0.5	nd	N/V
1,3-Dichloropropene, total	0.5	nd	5.2
Ethylbenzene	0.5	nd	2300
Hexane	1	nd	51
Methyl Ethyl Ketone (2-Butanone)	5	nd	470000
Methyl Butyl Ketone (2-Hexanone)	10	nd	N/V
Methyl Isobutyl Ketone	5	nd	140000
Methyl tert-butyl Ether (MTBE)	2	nd	190
Methylene Chloride	5	nd	610
Styrene	0.5	nd	1300
1,1,1,2-Tetrachloroethane	0.5	nd	3.4
1,1,2,2-Tetrachlorethane	0.5	nd	3.2
Tetrachloroethylene	0.5	nd	1.6
Toluene	0.5	nd	18000
1,2,4-Trichlorobenzene	0.5	nd	N/V
1,1,1-Trichloroethane	0.5	nd	640
1,1,2-Trichloroethane	0.5	nd	4.7
Trichloroethylene	0.5	nd	1.6
Trichlorofluoromethane	1.0	4.8	2,500
1,2,4-Trimethylbenzene	0.5	nd	N/V
1,3,5-Trimethylbenzene	0.5	nd	N/V
Vinyl Chloride	0.5	nd	0.5

Table 6 (continued)
Analytical Test Results - Groundwater
Volatile Organic Compounds (VOCs)

Parameter	MDL (µg/L)	Groundwater Sample (µg/L) July 13, 2011	Table 3 Non-Potable Groundwater
		BH 3-GW1	
Xylenes	0.5	nd	4,200

Notes:
- MDL - Method Detection Limit
- nd - not detected above the MDL
- N/V - no value provided by the MOE
- **Bold** - Value exceeds applicable MOE Standard

The parameters acetone, chloroform and trichlorofluoromethane were detected in the groundwater sample submitted for testing. The acetone and trichlorofluoromethane were detected in low concentrations that are in compliance with the MOE Table 3 standards. The chloroform concentration detected, 9.6 µg/L, slightly exceeds the MOE Table 3 standard. Based on our experience, chlorinated municipal water generally contains chloroform concentrations ranging from 10 µg/L to 20 µg/L. The chloroform identified is expected to be the result of the water used for the bedrock coring process (municipal water) and contains lower concentrations of chloroform than those typically associated with municipal water. Based on the expected source of the chloroform, it is not considered to be a concern for the site.

6.0 ASSESSMENT AND RECOMMENDATIONS

6.1 Assessment

A Modified Phase I - Environmental Site Assessment was carried out for the vacant property located at the Civic address 288 Booth Street, in the City of Ottawa, Ontario. The purpose of this environmental assessment was to research the past and current use of the site and adjacent properties and identify any environmental concerns with the potential to have impacted the subject property.

The historical research indicated that the subject site has been used for commercial and residential purposes since at least 1910. The subject site is currently listed as 288 Booth Street but has historically been listed as 801-813 Somerset Street West and 288 -292 Booth Street. A dry cleaners was identified on the southeast portion of the site from 1966 to 1973. It is not known whether this location was used as a drop off facility or if dry cleaning activities were actually conducted on the site. None of the other uses of the subject site identified were considered to pose an environmental concern. The subject site has been vacant since at least 2008. A former dry cleaners was located approximately 35 m to the east of the subject site between 1944 and 1965. The historical use of the subject site as a dry cleaners and, to a lesser extent, the former dry cleaners to the east were considered to have had the potential to have impacted the subject site.

Following the historical review, a site visit was conducted. The site is currently vacant and is barricaded by concrete blocks so that it may no longer be used as a parking lot. Adjacent properties are used for residential are commercial purposes. No environmental concerns were identified with the current use of the subject site or adjacent properties.

A geotechnical investigation was completed for the site in conjunction with the Phase I - ESA. Practical auger refusal on inferred bedrock was encountered between depths of 2.5 m and 3.1 m. One soil sample was submitted for analytical testing of metals and volatile organic compounds (VOCs). Low concentrations of various metals parameters were identified in the submitted soil sample which are in compliance with the current MOE Table 3 standards for the subject site. No detectable VOC concentrations were identified in the soil sample analysed. All of the soil samples analyzed are in compliance with the current MOE Table 3 standards.

One groundwater sample was recovered from the monitoring well installed in BH3 and submitted for analytical testing of volatile organic compounds (VOCs). The parameters acetone, chloroform and trichlorofluoromethane were detected in the groundwater sample submitted for testing. The acetone and trichlorofluoromethane were detected in low concentrations that are in compliance with the MOE Table 3 standards. The chloroform concentration detected, 9.6 µg/L, slightly exceeds the MOE Table 3 standard. Chlorinated municipal water generally contains chloroform concentrations ranging from 10 µg/L to 20 µg/L. The chloroform identified is expected to be the result of the municipal water that was used for the drill coring process and contains lower concentrations of chloroform than those typically associated with municipal water. Based on the expected source of the chloroform, it is not considered to be a concern for the site.

Based on field observations and the analytical test results, in our opinion the site has not been contaminated by the historical use of the dry cleaners on the subject site or on the property further to the east. **No further investigation is recommended.**

6.2 Recommendations

Groundwater Monitoring Well

The groundwater monitoring well installed in BH3 should be properly abandoned by a licensed well driller, if it is not going to be used in the future.

7.0 STATEMENT OF LIMITATIONS

This modified Phase I - Environmental Site Assessment (ESA) report has been prepared in general accordance with the agreed scope-of-work and the requirements of CSA Z768-01. The conclusions presented herein are based on information gathered from a limited historical review along with the field inspection and testing program. The findings of the Phase I - ESA are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment. The historical research relies on information supplied by others, such as local, provincial, and federal agencies and was limited within the scope-of-work, time, and budget of the project herein.

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 described by the test holes themselves.

This report was prepared for the sole use of Mr. Peter Evans. Permission from Mr. Peter Evans and our firm will be required to release this report to any other party.

Paterson Group Inc.

Beau Doherty, B.A.Sc.

Mark D'Arcy, P. Eng.

Report Distribution

- ❑ Mr. Peter Evans (3 copies and 1 electronic copy by email)
- ❑ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ANALYTICAL TEST RESULTS

patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Multi-Storey Building-288 Booth Street
Ottawa, Ontario

DATUM TBM - Top of catch basin. Geodetic elevation = 73.44m.

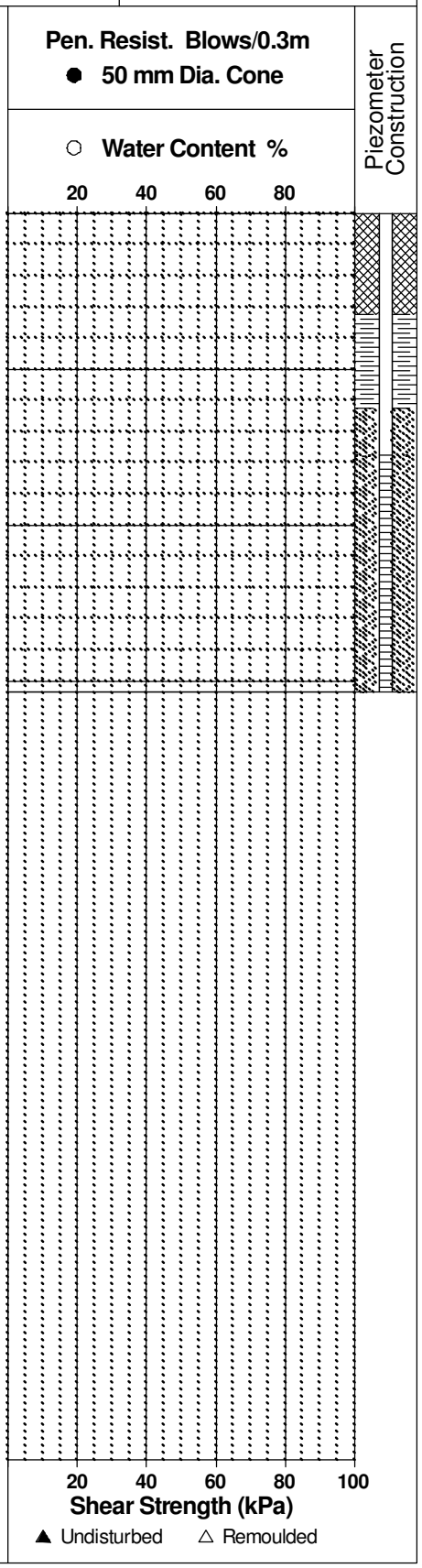
FILE NO. PG2403

REMARKS

HOLE NO. BH 1

BORINGS BY CME 55 Power Auger **DATE** 8 July 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	74.63
25mm Asphaltic concrete over crushed stone 0.08		AU	1				
FILL: Brown silty sand with gravel, asphalt and brick 0.69		AU	2				
FILL: Brown silty sand, trace gravel 1.45		SS	3	25	7	1	73.63
		SS	4	46	50+	2	72.63
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders 3.07		SS	5	42	50+		
		SS	6	50	50+	3	71.63
End of Borehole							
Practical refusal to augering @ 3.07m depth							



patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Multi-Storey Building-288 Booth Street
Ottawa, Ontario

DATUM TBM - Top of catch basin. Geodetic elevation = 73.44m.

FILE NO. PG2403

REMARKS

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger **DATE** 8 July 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	73.89
FILL: Gravel		AU	1				
0.38							
FILL: Brown silty sand with gravel		AU	2				
0.69							
Compact, brown **SILTY SAND,** some gravel		SS	3	38	26	1	72.89
		SS	4	42	11	2	71.89
2.21							
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders		SS	5	83	50+		
2.49							
End of Borehole							
Practical refusal to augering @ 2.49m depth							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Multi-Storey Building-288 Booth Street
Ottawa, Ontario

DATUM TBM - Top of catch basin. Geodetic elevation = 73.44m.

FILE NO. PG2403

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** 8 July 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	74.00
FILL: Gravel		AU	1				
0.36		AU	2				
FILL: Brown silty sand with gravel, cobbles and boulders		SS	3	40	50+	1	73.00
1.45		SS	4	50	9	2	72.00
FILL: Brown silty sand, trace gravel		SS	5	42	7		
2.97		RC	1	95	63	3	71.00
BEDROCK: Grey limestone		RC	2	100	72	4	70.00
		RC	3	100	85	5	69.00
6.96						6	68.00
End of Borehole							
(GWL @ 2.51m-July 13/11)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %
20 40 60 80

Monitoring Well Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Multi-Storey Building-288 Booth Street
Ottawa, Ontario

DATUM TBM - Top of catch basin. Geodetic elevation = 73.44m.

FILE NO. PG2403

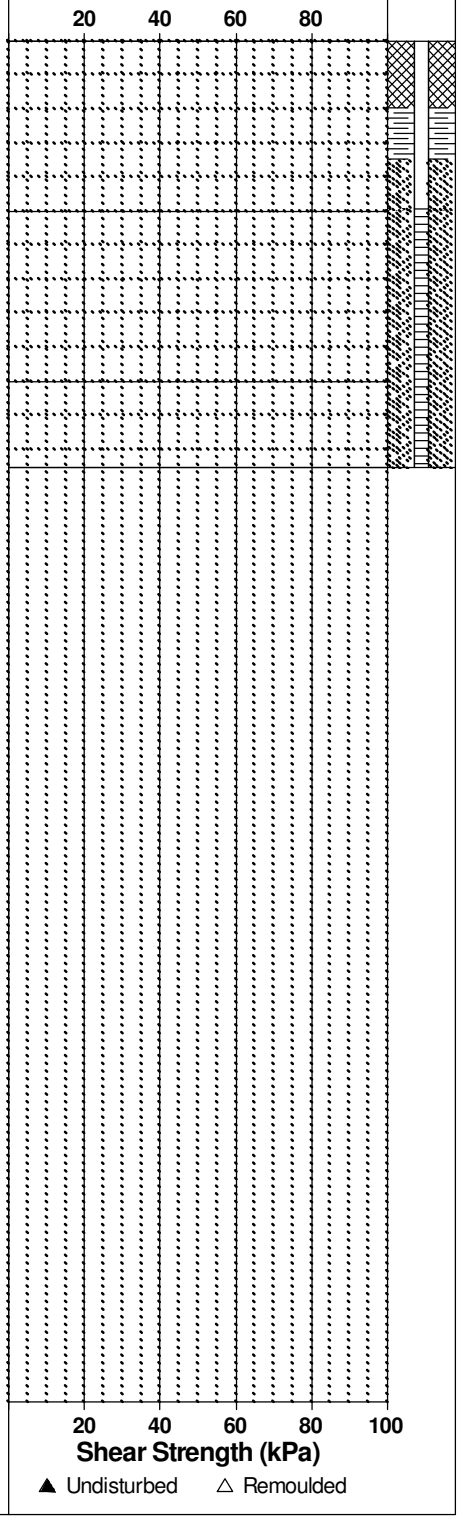
REMARKS

HOLE NO. BH 4

BORINGS BY CME 55 Power Auger **DATE** 8 July 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	74.19
FILL: Gravel		AU	1				
0.43							
FILL: Brown silty sand with gravel		AU	2				
0.69							
FILL: Brown silty sand		SS	3	25	10	1	73.19
1.45							
Loose to dense, brown **SILTY SAND,** trace gravel		SS	4	33	6	2	72.19
		SS	5	29	50+		
2.51							
End of Borehole							
Practcial refusal to augering @ 2.51m depth							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



Piezometer 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

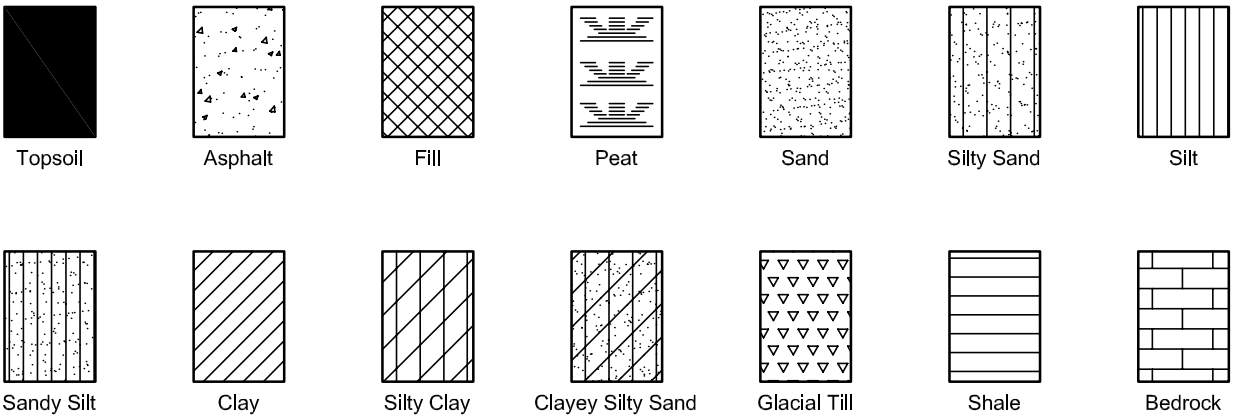
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

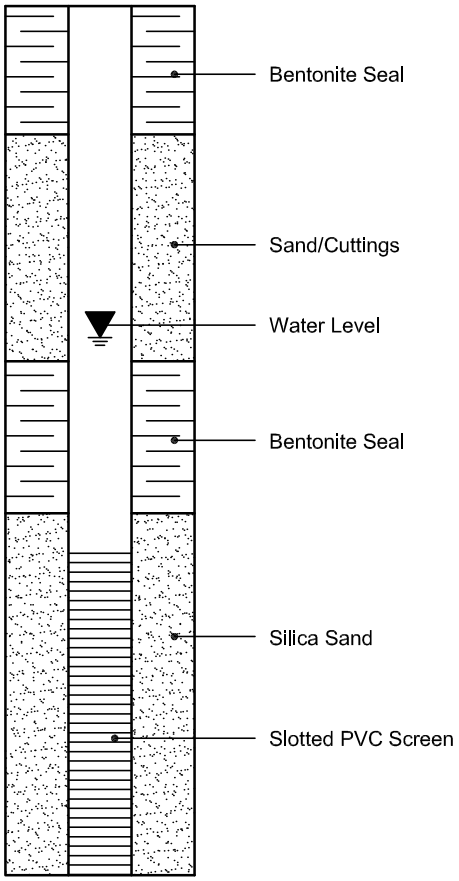
SYMBOLS AND TERMS (continued)

STRATA PLOT

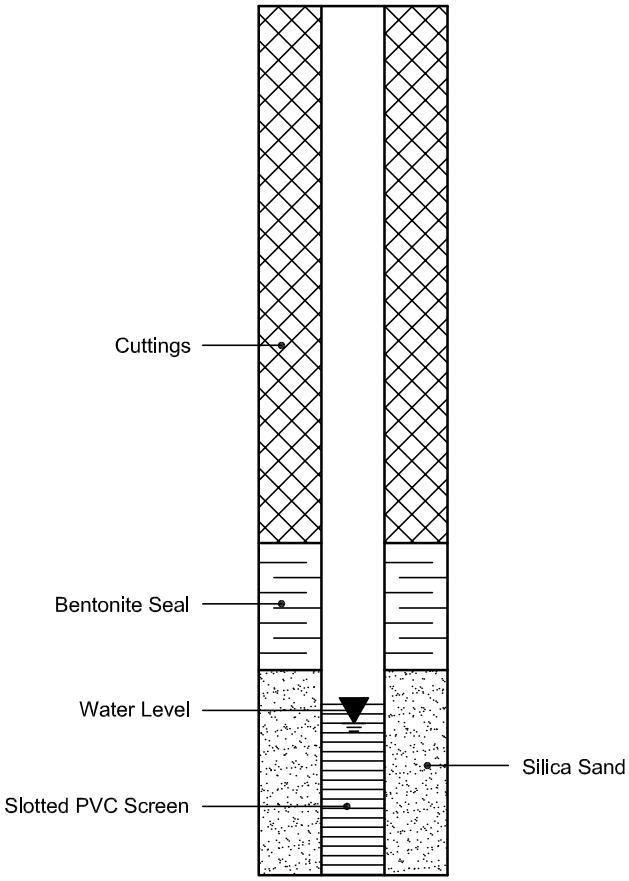


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.
OTTAWA ◉ NIAGARA FALLS ◉ MISSISSAUGA ◉ SARNIA

300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Certificate of Analysis

Paterson Group Consulting Engineers
28 Concourse Gate, Unit 1
Nepean, ON K2E 7T7
Attn: Mark D'Arcy

Phone: (613) 226-7381
Fax: (613) 226-6344

Client PO: 10927
Project: PE2328
Custody: 85647

Report Date: 14-Jul-2011
Order Date: 8-Jul-2011
Order #: 1128311

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

Paracel ID	Client ID
1128311-01	BH3-SS5

Approved By: Mark Foto

Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927 Project Description: PE2328

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals	EPA 6020 - Digestion - ICP-MS	12-Jul-11	12-Jul-11
Solids, %	Gravimetric, calculation	14-Jul-11	14-Jul-11
VOCs	EPA 8260 - P&T GC-MS	10-Jul-11	11-Jul-11

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

	Client ID:	BH3-SS5	-	-	-
	Sample Date:	08-Jul-11	-	-	-
	Sample ID:	1128311-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	86.8	-	-	-
Metals					
Antimony	1 ug/g dry	1	-	-	-
Arsenic	1 ug/g dry	10	-	-	-
Barium	1 ug/g dry	113	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	16.4	-	-	-
Cadmium	0.5 ug/g dry	0.6	-	-	-
Chromium	5 ug/g dry	44	-	-	-
Cobalt	1 ug/g dry	6	-	-	-
Copper	5 ug/g dry	41	-	-	-
Lead	1 ug/g dry	92	-	-	-
Molybdenum	1 ug/g dry	3	-	-	-
Nickel	5 ug/g dry	33	-	-	-
Selenium	1 ug/g dry	2	-	-	-
Silver	0.3 ug/g dry	1.2	-	-	-
Thallium	1 ug/g dry	<1	-	-	-
Uranium	1 ug/g dry	<1	-	-	-
Vanadium	10 ug/g dry	25	-	-	-
Zinc	20 ug/g dry	193	-	-	-
Volatiles					
Acetone	0.5 ug/g dry	<0.5	-	-	-
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	-	-	-
Chloroethane	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Chloromethane	0.2 ug/g dry	<0.2	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

	Client ID:	BH3-SS5	-	-	-
	Sample Date:	08-Jul-11	-	-	-
	Sample ID:	1128311-01	-	-	-
	MDL/Units	Soil	-	-	-
1,2-Dibromoethane	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-Dichloroethylene, total	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	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.5 ug/g dry	<0.5	-	-	-
Methyl Butyl Ketone (2-Hexanone)	2.0 ug/g dry	<2.0	-	-	-
Methyl Isobutyl Ketone	0.5 ug/g dry	<0.5	-	-	-
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	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,2,4-Trichlorobenzene	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	-	-	-
1,3,5-Trimethylbenzene	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	-	-	-

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

	Client ID:	BH3-SS5	-	-	-
	Sample Date:	08-Jul-11	-	-	-
	Sample ID:	1128311-01	-	-	-
	MDL/Units	Soil	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	90.5%	-	-	-
Dibromofluoromethane	Surrogate	98.0%	-	-	-
Toluene-d8	Surrogate	110%	-	-	-

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1	ug/g						
Arsenic	ND	1	ug/g						
Barium	ND	1	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5	ug/g						
Cobalt	ND	1	ug/g						
Copper	ND	5	ug/g						
Lead	ND	1	ug/g						
Molybdenum	ND	1	ug/g						
Nickel	ND	5	ug/g						
Selenium	ND	1	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1	ug/g						
Uranium	ND	1	ug/g						
Vanadium	ND	10	ug/g						
Zinc	ND	20	ug/g						
Volatiles									
Acetone	ND	0.5	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						
Chloroethane	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Chloromethane	ND	0.2	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dibromoethane	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-Dichloroethylene, total	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						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.5	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.0	ug/g						
Methyl Isobutyl Ketone	ND	0.5	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						

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	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						
1,3,5-Trimethylbenzene	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	*7.91*		*ug/g*		*98.9*	*50-140*			
Surrogate: Dibromofluoromethane	*8.58*		*ug/g*		*107*	*50-140*			
Surrogate: Toluene-d8	*8.14*		*ug/g*		*102*	*50-140*			

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1	ug/g dry	ND				30	
Arsenic	3.0	1	ug/g dry	3.0			0.4	30	
Barium	31.2	1	ug/g dry	32.1			2.9	30	
Beryllium	ND	0.5	ug/g dry	ND				30	
Boron	ND	5.0	ug/g dry	ND				30	
Cadmium	ND	0.5	ug/g dry	ND				30	
Chromium	5.6	5	ug/g dry	5.8			3.1	30	
Cobalt	2.0	1	ug/g dry	2.2			7.6	30	
Copper	ND	5	ug/g dry	ND				30	
Lead	4.1	1	ug/g dry	4.3			4.4	30	
Molybdenum	ND	1	ug/g dry	1.1			0.0	30	
Nickel	ND	5	ug/g dry	ND				30	
Selenium	ND	1	ug/g dry	ND				30	
Silver	ND	0.3	ug/g dry	ND				30	
Thallium	ND	1	ug/g dry	ND				30	
Uranium	ND	1	ug/g dry	ND				30	
Vanadium	15.5	10	ug/g dry	16.3			5.1	30	
Zinc	ND	20	ug/g dry	ND				30	
Physical Characteristics									
% Solids	85.6	0.1	% by Wt.	87.4			2.1	25	
Volatiles									
Acetone	ND	0.5	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	
Chloroethane	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Chloromethane	ND	0.2	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-Dibromoethane	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	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.5	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.0	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.5	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	

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,2,4-Trichlorobenzene	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	
1,3,5-Trimethylbenzene	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	*10.0*		*ug/g dry*	*ND*	*98.5*	*50-140*			
Surrogate: Dibromofluoromethane	*8.94*		*ug/g dry*	*ND*	*88.0*	*50-140*			
Surrogate: Toluene-d8	*11.4*		*ug/g dry*	*ND*	*112*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	50.4		ug/L	ND	101	70-130			
Arsenic	50.9		ug/L	1.2	99.5	70-130			
Barium	61.4		ug/L	12.9	97.1	70-130			
Beryllium	48.2		ug/L	0.08	96.3	70-130			
Boron	45.2		ug/L	2.0	86.4	70-130			
Cadmium	47.9		ug/L	0.04	95.7	70-130			
Chromium	49.1		ug/L	2.3	93.7	70-130			
Cobalt	46.2		ug/L	0.9	90.6	70-130			
Copper	47.8		ug/L	1.5	92.7	70-130			
Lead	49.8		ug/L	1.7	96.1	70-130			
Molybdenum	48.0		ug/L	0.4	95.2	70-130			
Nickel	46.2		ug/L	1.3	90.0	70-130			
Selenium	49.9		ug/L	0.3	99.2	70-130			
Silver	57.9		ug/L	0.08	116	70-130			
Thallium	52.5		ug/L	0.02	105	70-130			
Uranium	44.1		ug/L	0.2	87.9	70-130			
Vanadium	52.0		ug/L	6.5	90.9	70-130			
Zinc	53.4		ug/L	6.6	93.5	70-130			
Volatiles									
Acetone	11.0	0.5	ug/g	ND	110	50-140			
Benzene	3.9	0.02	ug/g	ND	97.1	60-130			
Bromodichloromethane	4.6	0.05	ug/g	ND	115	60-130			
Bromoform	5.0	0.05	ug/g	ND	126	60-130			
Bromomethane	4.9	0.05	ug/g	ND	123	50-140			
Carbon Tetrachloride	3.1	0.05	ug/g	ND	78.1	60-130			
Chlorobenzene	3.5	0.05	ug/g	ND	86.9	60-130			
Chloroethane	2.9	0.05	ug/g	ND	71.7	50-140			
Chloroform	4.6	0.05	ug/g	ND	115	60-130			
Chloromethane	2.8	0.2	ug/g	ND	69.9	50-140			
Dibromochloromethane	5.0	0.05	ug/g	ND	126	60-130			
Dichlorodifluoromethane	4.0	0.05	ug/g	ND	100	50-140			
1,2-Dibromoethane	4.6	0.05	ug/g	ND	116	60-130			
1,2-Dichlorobenzene	3.2	0.05	ug/g	ND	78.8	60-130			
1,3-Dichlorobenzene	3.3	0.05	ug/g	ND	83.4	60-130			
1,4-Dichlorobenzene	3.1	0.05	ug/g	ND	76.9	60-130			
1,1-Dichloroethane	3.5	0.05	ug/g	ND	87.7	60-130			
1,2-Dichloroethane	5.0	0.05	ug/g	ND	124	60-130			
1,1-Dichloroethylene	3.1	0.05	ug/g	ND	77.6	60-130			
cis-1,2-Dichloroethylene	2.9	0.05	ug/g	ND	73.7	60-130			
trans-1,2-Dichloroethylene	2.8	0.05	ug/g	ND	71.1	60-130			
1,2-Dichloropropane	2.8	0.05	ug/g	ND	70.6	60-130			
cis-1,3-Dichloropropylene	4.1	0.05	ug/g	ND	103	60-130			
trans-1,3-Dichloropropylene	5.1	0.05	ug/g	ND	127	60-130			
Ethylbenzene	3.5	0.05	ug/g	ND	86.4	60-130			
Hexane	4.7	0.05	ug/g	ND	116	60-130			
Methyl Ethyl Ketone (2-Butanone)	9.2	0.5	ug/g	ND	91.7	50-140			
Methyl Butyl Ketone (2-Hexanone)	9.0	2.0	ug/g	ND	89.7	50-140			
Methyl Isobutyl Ketone	7.5	0.5	ug/g	ND	74.5	50-140			
Methyl tert-butyl ether	7.4	0.05	ug/g	ND	74.3	50-140			

Certificate of Analysis

Report Date: 14-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:8-Jul-2011

Client PO: 10927

Project Description: PE2328

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	4.1	0.05	ug/g	ND	102	60-130			
Styrene	3.6	0.05	ug/g	ND	91.2	60-130			
1,1,1,2-Tetrachloroethane	4.5	0.05	ug/g	ND	112	60-130			
1,1,2,2-Tetrachloroethane	3.3	0.05	ug/g	ND	82.4	60-130			
Tetrachloroethylene	4.2	0.05	ug/g	ND	106	60-130			
Toluene	3.8	0.05	ug/g	ND	94.7	60-130			
1,2,4-Trichlorobenzene	4.6	0.05	ug/g	ND	115	60-130			
1,1,1-Trichloroethane	5.0	0.05	ug/g	ND	125	60-130			
1,1,2-Trichloroethane	3.0	0.05	ug/g	ND	76.0	60-130			
Trichloroethylene	3.3	0.05	ug/g	ND	83.2	60-130			
Trichlorofluoromethane	4.9	0.05	ug/g	ND	123	50-140			
1,3,5-Trimethylbenzene	2.1	0.05	ug/g	ND	53.1	60-130			QS-02
Vinyl chloride	5.0	0.02	ug/g	ND	125	50-140			
m,p-Xylenes	7.4	0.05	ug/g	ND	92.2	60-130			
o-Xylene	3.9	0.05	ug/g	ND	97.9	60-130			
Surrogate: 4-Bromofluorobenzene	*7.94*		*ug/g*		*99.3*	*50-140*			
Surrogate: Dibromofluoromethane	*7.43*		*ug/g*		*92.9*	*50-140*			
Surrogate: Toluene-d8	*7.14*		*ug/g*		*89.2*	*50-140*			

Sample and QC Qualifiers Notes

1- QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
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.

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.
OTTAWA ◉ NIAGARA FALLS ◉ MISSISSAUGA ◉ SARNIA

300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Certificate of Analysis

Paterson Group Consulting Engineers
28 Concourse Gate, Unit 1
Nepean, ON K2E 7T7
Attn: Eric Leveque

Phone: (613) 226-7381
Fax: (613) 226-6344

Client PO: 11519
Project: PE2328
Custody: 85596

Report Date: 18-Jul-2011
Order Date: 13-Jul-2011
Order #: 1129178

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

Paracel ID	Client ID
1129178-01	BH3-GW1

Approved By: Mark Foto

Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519 Project Description: PE2328

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs	EPA 624 - P&T GC-MS	15-Jul-11	17-Jul-11

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519

Project Description: PE2328

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	13-Jul-11	-	-	-
	Sample ID:	1129178-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	175	-	-	-
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	-	-	-
Chloroethane	1.0 ug/L	<1.0	-	-	-
Chloroform	0.5 ug/L	9.6	-	-	-
Chloromethane	3.0 ug/L	<3.0	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethylene, total	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	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	-	-	-
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	-	-	-

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519

Project Description: PE2328

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	13-Jul-11	-	-	-
	Sample ID:	1129178-01	-	-	-
	MDL/Units	Water	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,2,4-Trichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	4.8	-	-	-
1,2,4-Trimethylbenzene	0.5 ug/L	<0.5	-	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	92.5%	-	-	-
Dibromofluoromethane	Surrogate	126%	-	-	-
Toluene-d8	Surrogate	113%	-	-	-

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519

Project Description: PE2328

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						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	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-Dichloroethylene, total	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						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	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						
1,2,4-Trichlorobenzene	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						
1,2,4-Trimethylbenzene	ND	0.5	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	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	*30.3*		*ug/L*		*94.6*	*50-140*			
Surrogate: Dibromofluoromethane	*36.8*		*ug/L*		*115*	*50-140*			
Surrogate: Toluene-d8	*36.9*		*ug/L*		*115*	*50-140*			

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519

Project Description: PE2328

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	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	
Chloroethane	ND	1.0	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Chloromethane	ND	3.0	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dibromoethane	ND	0.2	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	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	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	
1,2,4-Trichlorobenzene	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	
1,2,4-Trimethylbenzene	ND	0.5	ug/L	ND				30	
1,3,5-Trimethylbenzene	ND	0.5	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	*28.8*		*ug/L*	*ND*	*89.8*	*50-140*			
Surrogate: Dibromofluoromethane	*37.2*		*ug/L*	*ND*	*116*	*50-140*			
Surrogate: Toluene-d8	*38.0*		*ug/L*	*ND*	*119*	*50-140*			

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519 Project Description: PE2328

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	74.9	5.0	ug/L	ND	74.9	50-140			
Benzene	37.2	0.5	ug/L	ND	92.9	50-140			
Bromodichloromethane	31.4	0.5	ug/L	ND	78.4	50-140			
Bromoform	45.7	0.5	ug/L	ND	114	50-140			
Bromomethane	28.6	0.5	ug/L	ND	71.5	50-140			
Carbon Tetrachloride	37.2	0.2	ug/L	ND	92.9	50-140			
Chlorobenzene	41.8	0.5	ug/L	ND	104	50-140			
Chloroethane	43.0	1.0	ug/L	ND	107	50-140			
Chloroform	39.6	0.5	ug/L	ND	98.9	50-140			
Chloromethane	32.9	3.0	ug/L	ND	82.3	50-140			
Dibromochloromethane	41.4	0.5	ug/L	ND	103	50-140			
Dichlorodifluoromethane	35.6	1.0	ug/L	ND	89.0	50-140			
1,2-Dibromoethane	43.6	0.2	ug/L	ND	109	50-140			
1,2-Dichlorobenzene	32.2	0.5	ug/L	ND	80.5	50-140			
1,3-Dichlorobenzene	33.6	0.5	ug/L	ND	84.0	50-140			
1,4-Dichlorobenzene	33.3	0.5	ug/L	ND	83.2	50-140			
1,1-Dichloroethane	31.8	0.5	ug/L	ND	79.6	50-140			
1,2-Dichloroethane	48.0	0.5	ug/L	ND	120	50-140			
1,1-Dichloroethylene	42.0	0.5	ug/L	ND	105	50-140			
cis-1,2-Dichloroethylene	33.1	0.5	ug/L	ND	82.8	50-140			
trans-1,2-Dichloroethylene	27.9	0.5	ug/L	ND	69.8	50-140			
1,2-Dichloropropane	33.6	0.5	ug/L	ND	84.0	50-140			
cis-1,3-Dichloropropylene	35.3	0.5	ug/L	ND	88.2	50-140			
trans-1,3-Dichloropropylene	25.2	0.5	ug/L	ND	63.1	50-140			
Ethylbenzene	41.1	0.5	ug/L	ND	103	50-140			
Hexane	34.5	1.0	ug/L	ND	86.3	50-140			
Methyl Ethyl Ketone (2-Butanone)	128	5.0	ug/L	ND	128	50-140			
Methyl Butyl Ketone (2-Hexanone)	78.6	10.0	ug/L	ND	78.6	50-140			
Methyl Isobutyl Ketone	64.2	5.0	ug/L	ND	64.2	50-140			
Methyl tert-butyl ether	63.7	2.0	ug/L	ND	63.7	50-140			
Methylene Chloride	48.5	5.0	ug/L	ND	121	50-140			
Styrene	36.3	0.5	ug/L	ND	90.7	50-140			
1,1,1,2-Tetrachloroethane	33.2	0.5	ug/L	ND	83.1	50-140			
1,1,2,2-Tetrachloroethane	50.6	0.5	ug/L	ND	126	50-140			
Tetrachloroethylene	40.1	0.5	ug/L	ND	100	50-140			
Toluene	38.6	0.5	ug/L	ND	96.4	50-140			
1,2,4-Trichlorobenzene	29.8	0.5	ug/L	ND	74.4	50-140			
1,1,1-Trichloroethane	38.9	0.5	ug/L	ND	97.2	50-140			
1,1,2-Trichloroethane	21.0	0.5	ug/L	ND	52.4	50-140			
Trichloroethylene	39.3	0.5	ug/L	ND	98.2	50-140			
Trichlorofluoromethane	42.1	1.0	ug/L	ND	105	50-140			
1,2,4-Trimethylbenzene	ND	0.5	ug/L	ND		50-140			
1,3,5-Trimethylbenzene	32.0	0.5	ug/L	ND	80.0	50-140			
Vinyl chloride	46.4	0.5	ug/L	ND	116	50-140			
m,p-Xylenes	84.3	0.5	ug/L	ND	105	50-140			
o-Xylene	43.5	0.5	ug/L	ND	109	50-140			
Surrogate: 4-Bromofluorobenzene	*25.8*		*ug/L*		*80.7*	*50-140*			
Surrogate: 4-Bromofluorobenzene	*25.4*		*ug/L*		*79.2*	*50-140*			
Surrogate: Dibromofluoromethane	*27.3*		*ug/L*		*85.4*	*50-140*			
Surrogate: Dibromofluoromethane	*34.3*		*ug/L*		*107*	*50-140*			

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519 Project Description: PE2328

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Toluene-d8	*34.0*		*ug/L*		*106*	*50-140*			
Surrogate: Toluene-d8	*29.1*		*ug/L*		*91.0*	*50-140*			

Certificate of Analysis

Report Date: 18-Jul-2011

Client: **Paterson Group Consulting Engineers**

Order Date:13-Jul-2011

Client PO: 11519 Project Description: PE2328

Sample and QC Qualifiers Notes

None

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

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

PARACEL LABORATORIES LTD. | TRUSTED. RESPONSIVE. RELIABLE.

OTTAWA ◉ KINGSTON ◉ NIAGARA ◉ MISSISSAUGA ◉ SARNIA

Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Chain of Custody
(Lab Use Only)
Nº 85596

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE 2328	TAT: [✓] Regular
Contact Name: Eric Leveque	Quote #	[ ] 2 Day
Address: 28 Concourse gate	PO # 11519	[ ] 1 Day
	Email Address: eleveque@patersongroup.ca	[ ] Same Day
Telephone: (613) 226-7381		Date Required:

Samples Submitted Under: [ ] O. Reg. 153/04 Table __ [ ] O. Reg 511/09 Table 3 [ ] PWQO [ ] CCME [ ] Sewer Use (Storm) [ ] Sewer Use (Sanitary) [ ] Other:

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

Paracel Order Number: 1129178

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: VOCs
1	~~VOC~~ BH3-GW1	GW		2	July 13/11	9:30AM	✓
2							
3							
4							
5							
6							
7							
8							
9							
10							

Comments:

Method of Delivery: Paracel

Relinquished By (Print & Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Daniel Smith		M/C	M/C
Date/Time: July 13/11	Date/Time: 13/07/11 10:25AM	Date/Time: July 13/11 11:22	Date/Time: July 13/11 1:04
	Temperature: ____ °C	Temperature: 19.3 °C	pH Verified [ ] By:

APPENDIX 2

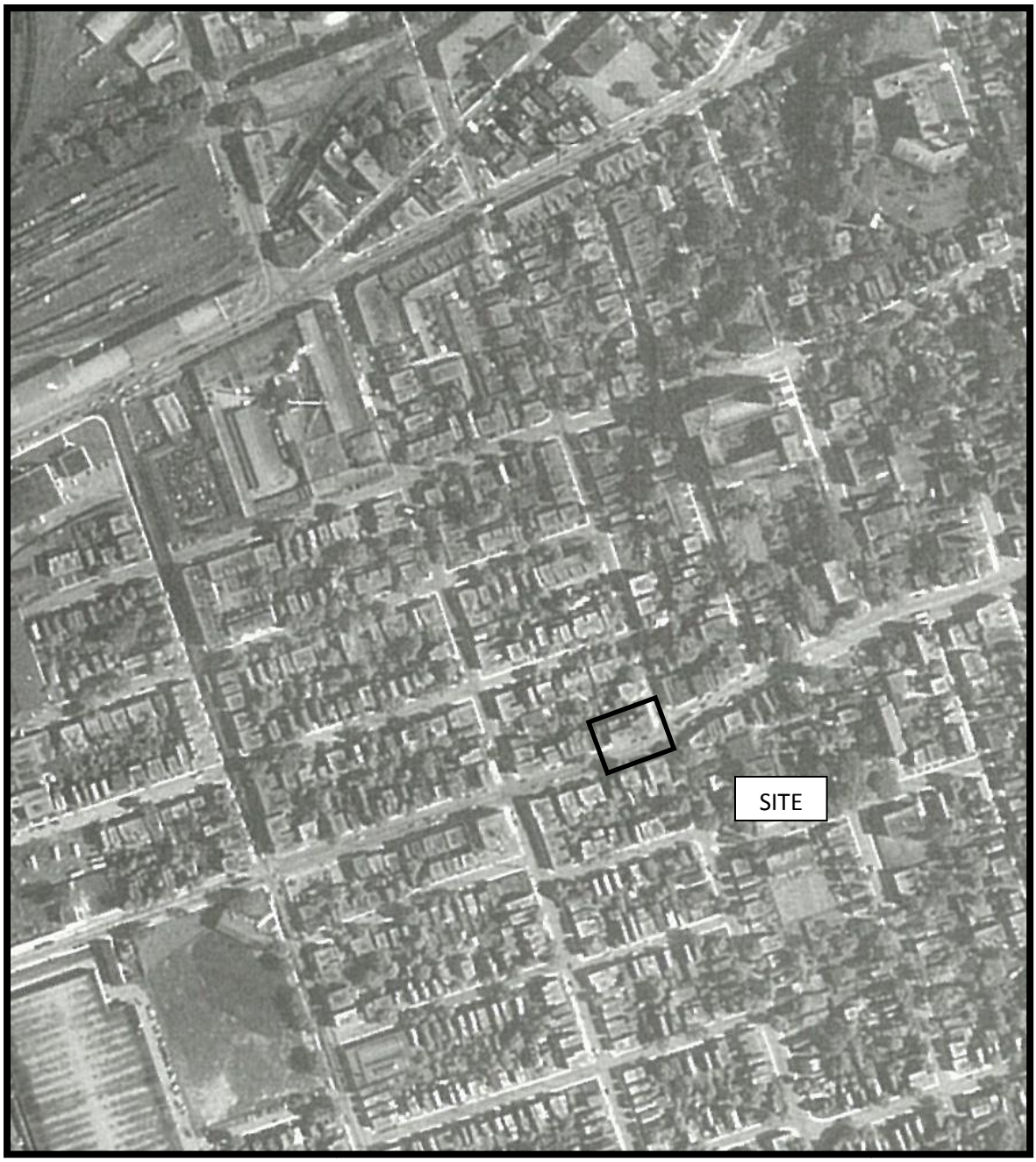
AERIAL PHOTOGRAPHS

MOE FREEDOM OF INFORMATION

FIGURE 1 - KEY PLAN

DRAWING PE2328-1 - TEST HOLE LOCATION PLAN

AERIAL PHOTOGRAPH
1922



AERIAL PHOTOGRAPH
1950

AERIAL PHOTOGRAPH
1958

AERIAL PHOTOGRAPH
1969

AERIAL PHOTOGRAPH
1984

AERIAL PHOTOGRAPH
1992

Ministry of the Environment

Freedom of Information and Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de l'Environnement

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc. : (416) 314-4285

Ontario

June 30, 2011

Beau Doherty
Paterson Group Inc
1 - 28 Concourse Gate
Ottawa, ON K2E 7T7

Dear Beau Doherty:

RE: ***Freedom of Information and Protection of Privacy Act* Request**
Our File # A-2011-02706, Your Reference PE2328

This letter is in response to your request made pursuant to the *Freedom of Information and Protection of Privacy Act* relating to 288 - 292 Booth Street (Even #s ONLY) and 801 - 813 Somerset Street West (Odd #s ONLY), Ottawa.

After a thorough search through the files of the Ministry's Ottawa District Office, Investigations and Enforcement Branch, Environmental Monitoring and Reporting Branch, Sector Compliance Branch and Safe Drinking Water Branch, no records were located responsive to your request. To provide you with this response and in accordance with Section 57 of the *Freedom of Information and Protection of Privacy Act*, the fee owed is $30.00 for 1 hour of search time @ $30.00 per hour. **We have applied the $30.00 for this request from your initial payment.**

To conduct a search of the files of the Environmental Assessment and Approvals Branch requires an additional 10 hours of search time. If you would like us to search for Certificates of Approval, **please forward to me at the above address payment by cheque (made payable to the Minister of Finance (FOI)") or credit card in the amount of $300.00.** Please note that there is no guarantee that any records will be located. Please note, a request for records must usually be answered within 30 calendar days, however Section 27 allows for time extensions under certain circumstances. If you choose to have the search conducted at the Environmental Assessment and Approvals Branch, the time for answering your request will be extended for an additional 30 days.

When remitting payment please quote our file number or attach a copy of this letter.

If you object to any decision I have made, you may request a review by contacting the Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, ON M4W 1A8 (800-387-0073 or 416-326-3333). Please note that there is a $25.00 fee and you only have 30 days from receipt of this letter to request a review.

If you have any questions regarding this matter, please contact Liz Mico at (416) 212-0559.

Yours truly,

Donna Currie
FOI Coordinator
Freedom of Information and Protection of Privacy Office

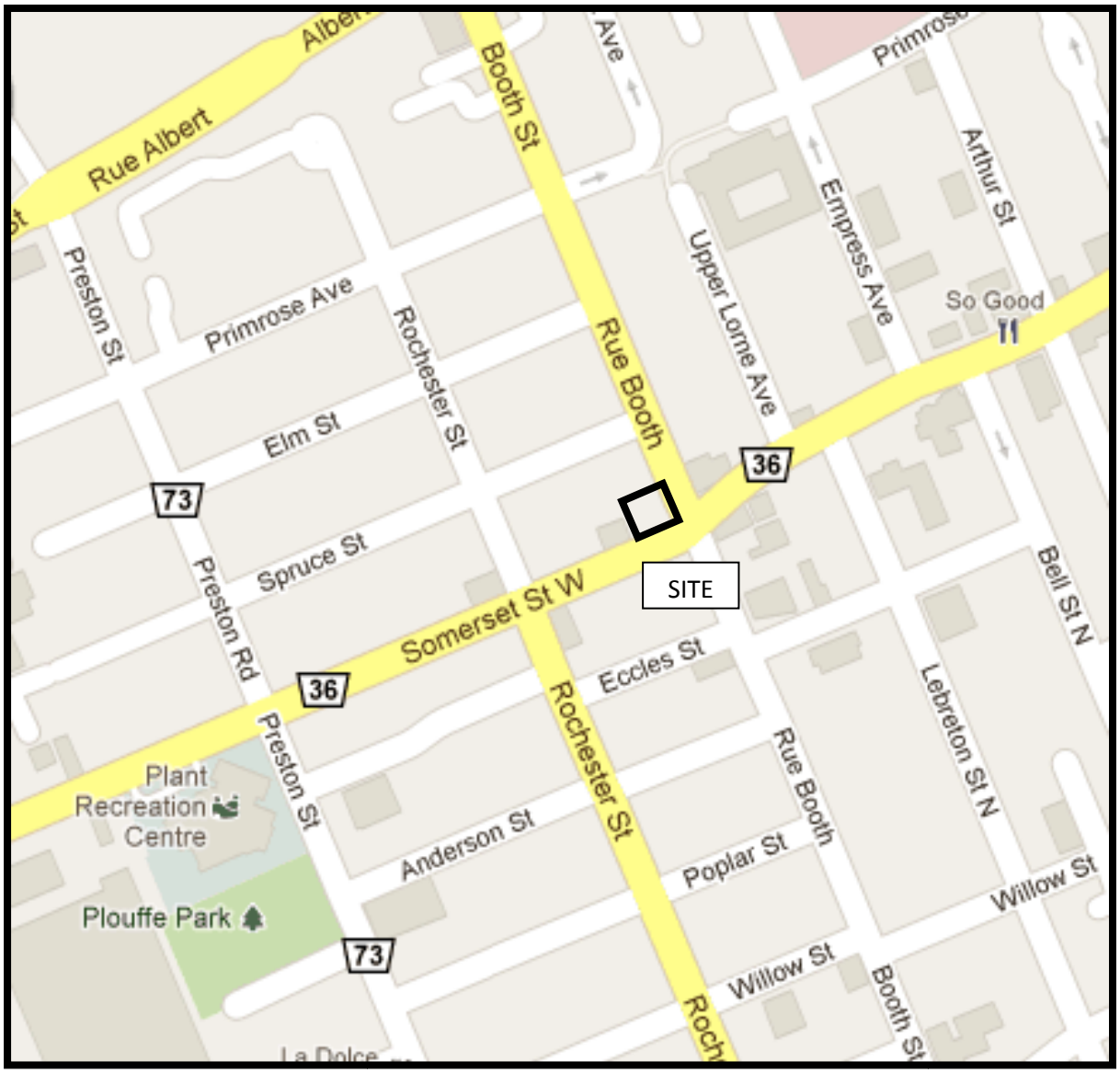


FIGURE 1

KEY PLAN

#14 SPRUCE STREET
RESIDENTIAL

#2-12 SPRUCE STREET
RESIDENTIAL

ASPHALTIC
CONCRETE

#282 BOOTH STREET
3-STOREY RESIDENTIAL
APARTMENTS

EXISTING BRICK
GARAGE

BH 1
74.63
(71.56)

ASPHALTIC
CONCRETE

GRAVEL

BH 4
74.19
(71.68)

CB-TBM
CB

BH 3
74.00
[71.03]

#817 SOMERSET ST. W.
RESTAURANT

#815 SOMERSET STREET W.
JEWELLERY STORE

BH 2
73.89
(71.40)

BELL
MH

SECOND FLOOR - COMMERCIAL
OFFICES AND RESIDENTIAL
APARTMENTS

#797 BOOTH STREET
PHARMACY

#791 BOOTH STREET
GROCERY STORE

B O O T H S T R E E T

S O M E R S E T S T R E E T W E S T

LEGEND:

- BOREHOLE LOCATION
- BOREHOLE LOCATION, MONITORING WELL INSTALLED
- 74.63 GROUND SURFACE ELEVATION (m)
- [71.03] BEDROCK SURFACE ELEVATION (m)
- (71.56) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)

TBM - TOP OF CATCH BASIN. GEODETIC ELEVATION = 73.44m.

SCALE - 1:250

0 2 4 10 15m

paterson group
consulting engineers
28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7

Scale:	1:250
Des.:	BD
Dwn:	MPG
Chkd:	MSD

MR. PETER EVANS

MODIFIED PHASE I - ENVIRONMENTAL SITE ASSESSMENT
288 BOOTH STREET
OTTAWA, ONTARIO

TEST HOLE LOCATION PLAN

Dwg. No. **PE2328-1**
Report No.: PE2328-1
Date: 07/2011