

**FINAL Report - Phase Two
Environmental Site
Assessment**

Vacant Land Parcel, Boteler
Street
Parts 2, 4, 5, And 6 Of Plan 4r-
26468, Part Of Lot 3 And Part Of
Lot 7 Rcp 611769
Ottawa, Ontario



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Table of Contents

1.0	EXECUTIVE SUMMARY	1.1
2.0	INTRODUCTION	2.1
2.1	SITE DESCRIPTION	2.1
2.2	PROPERTY OWNERSHIP	2.1
2.3	CURRENT AND PROPOSED FUTURE USES	2.2
2.4	APPLICABLE SITE CONDITION STANDARD	2.2
3.0	BACKGROUND INFORMATION	3.1
3.1	PHYSICAL SETTING	3.1
3.2	PAST INVESTIGATIONS	3.1
3.2.1	Subgrade Investigation, Ottawa Approach to Proposed MacDonald-Cartier Bridge, Ottawa, Ontario, prepared by H.Q. Golder & Associates Ltd., dated October, 1962.....	3.2
3.2.2	Limited Phase I Environmental Site Assessment, King Edward Avenue and Sussex Drive Rights-of-Ways, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated February 2001	3.2
3.2.3	Geotechnical Inventory, King Edward Avenue, Ottawa, Ontario, prepared by Jacques Whitford and Associates Limited, dated February 2001.....	3.3
3.2.4	Draft Limited Phase II Environmental Site Assessment, King Edward Ave. Overpass Structures over the Union Ave. to King Edward Ave. Ramp, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated April 2004.....	3.3
3.2.5	Draft Supplemental Phase II ESA, King Edward Avenue Right-of- way (Laurier Avenue East to Boteler Street) and Area of Structures North of King Edward Right-of-Way, Ottawa, Ontario, prepared by Jacques Whitford Limited, dated October 26, 2004.....	3.4
3.2.6	Modified Phase I Environmental Site Assessment, Boteler Street from Dalhousie Street to King Edward Avenue, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated January 2006.	3.4
3.2.7	Limited Phase II Environmental Site Assessment, Boteler Street from Dalhousie Street to King Edward Avenue, Ottawa, ON, prepared by Jacques Whitford Environment Limited, dated January 2006.	3.4
3.2.8	Soil Sampling Results, United Arab Emirates (UAE) Embassy, 125 Boteler Street, Ottawa, Ontario, prepared by Trow Associates Inc., dated April 11, 2006.....	3.5
3.2.9	Phase I ESA, Vacant Land Parcels, Boteler Street, Parcel 1 and 2, Lot 7, RCP61 1769, Ottawa, Ontario, prepared by Stantec Consulting Ltd., dated June 26, 2013.	3.5

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

3.2.10	Phase II ESA, Vacant Land Parcels, Boteler Street, Parcel 1 and 2, Lot 7, RCP 611769, Ottawa, Ontario, prepared by Stantec Consulting Ltd., dated June 27, 2013.	3.6
3.2.11	Draft Phase One ESA, Parts 2, 4, 5, and 6 of Plan 4R-26468, Part of Lot 3 and Part of Lot 7 RCP 611769, Ottawa, Ontario, prepared by Stantec Consulting Ltd., dated June 28, 2013.	3.6
4.0	SCOPE OF THE INVESTIGATION	4.1
4.1	OVERVIEW OF SITE INVESTIGATION	4.1
4.2	MEDIA INVESTIGATED	4.1
4.3	PHASE ONE CONCEPTUAL SITE MODEL	4.2
4.4	DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN.....	4.2
4.5	IMPEDIMENTS	4.2
5.0	INVESTIGATION METHOD	5.1
5.1	GENERAL	5.1
5.2	TEST PITTING.....	5.1
5.3	DRILLING.....	5.2
5.4	FIELD SCREENING MEASUREMENTS	5.3
5.5	GROUNDWATER: MONITORING WELL INSTALLATION	5.4
5.6	GROUNDWATER: LEVEL MEASUREMENTS	5.5
5.7	GROUNDWATER FIELD MEASUREMENT OF WATER QUALITY PARAMETERS.....	5.6
5.8	GROUNDWATER: SAMPLING.....	5.6
5.9	RESIDUAL MANAGEMENT PROCEDURES	5.8
5.10	SEDIMENT: SAMPLING	5.8
5.11	ANALYTICAL TESTING	5.8
5.12	SURVEYING.....	5.9
5.13	QUALITY ASSURANCE AND QUALITY CONTROL MEASURES	5.9
6.0	REVIEW AND EVALUATION.....	6.1
6.1	GEOLOGY	6.1
6.1.1	SURFICIAL GEOLOGY.....	6.1
6.1.2	BEDROCK GEOLOGY.....	6.2
6.2	GROUNDWATER: ELEVATIONS AND FLOW DIRECTION.....	6.2
6.3	GROUND WATER: HYDRAULIC GRADIENTS	6.4
6.4	FINE-MEDIUM SOIL TEXTURE	6.4
6.5	SOIL: FIELD SCREENING.....	6.4
6.6	SOIL QUALITY	6.4
6.6.1	SUMMARY OF SOIL QUALITY AND IDENTIFICATION OF COCS.....	6.5
6.7	GROUNDWATER QUALITY.....	6.7
6.8	SEDIMENT QUALITY	6.8
6.9	QUALITY ASSURANCE AND QUALITY CONTROL RESULTS.....	6.8
6.10	PHASE TWO CONCEPTUAL SITE MODEL.....	6.9
6.10.1	AREAS OF POTENTIAL ENVIRONMENTAL CONCERN.....	6.9



**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

6.10.2	PHYSICAL SETTING	6.10
6.10.3	IDENTIFICATION AND DISTRIBUTION OF COCS	6.11
6.10.4	RISK ASSESSMENT	6.12
7.0	CONCLUSIONS	7.1
7.1	SIGNATURES	7.2
8.0	BIBLIOGRAPHY	8.1

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

LIST OF TABLES

Table 2-1 Conceptual Site Model Physical Characteristics/Pathways 3.7
Table 2-2 Summary of Areas of Potential Environmental Concern to Phase Two Property
..... 3.9

Appendix A

Table 1 Summary of Monitoring Well Installation Details
Table 2 Summary of Water Elevations
Table 3 Test Pit Surficial Soil Analytical Results
Table 4 Test Pit Soil Analytical Results
Table 5 Borehole/Monitoring Well Soil Analytical Results
Table 6 Groundwater Analytical Results
Table 7 2014 Borehole PAH Bulk Soil Analytical Results
Table 8 2014 Borehole PAH Leachate Analytical Results
Table 9 Maximum Soil Concentrations
Table 10 Maximum Groundwater Concentrations

LIST OF FIGURES

Appendix B

Figure 1 Site Plan and Conceptual Site Model
Figure 2 Sampling and Cross Section Locations
Figure 3 Soil Analytical Results
Figure 4 Groundwater Analytical Results
Figure 5a Groundwater Flow Diagram (July 2013)
Figure 5b Groundwater Flow Diagram (April 24, 2014)
Figure 6 Soil Cross-Section A-A'
Figure 7 Soil Cross-Section B-B'
Figure 8 Groundwater Cross-Section A-A'
Figure 9 Groundwater Cross-Section B-B'

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

LIST OF APPENDICES

APPENDIX A	TABLES	A.1
APPENDIX B	FIGURES	B.1
APPENDIX C	SURVEY OF PHASE TWO PROPERTY (TO BE INCLUDED IN SUBSEQUENT VERSIONS OF THE REPORT)	C.1
APPENDIX D	SAMPLING AND ANALYSIS PLAN	D.1
D.1	SAMPLING AND ANALYSIS PLAN	D.2
APPENDIX E	TEST PIT, BOREHOLE AND MONITORING WELL LOGS	E.1
APPENDIX F	SOIL REMEDIATION	F.1
APPENDIX G	BACKFILL SOIL SAMPLING	G.1
APPENDIX H	PHOTOLOG	H.1
APPENDIX I	LABORATORY CERTIFICATES OF ANALYSIS	I.1

1.0 EXECUTIVE SUMMARY

At the request of the City of Ottawa (the City) and the State of Qatar, Stantec conducted a Phase Two Environmental Site Assessment (Phase Two ESA) of the vacant parcel of land, Part of Lot 3 and Part of Lot 7, RCP 611769, designated as Parts 2, 4, 5, and 6, Plan 4R-26468, Boteler Street, Ottawa, Ontario (the Phase Two Property). The Phase Two ESA was conducted to identify the presence, location, and concentration of contaminants of concern (COC) in soil and groundwater across the Phase Two Property. The Phase Two ESA was conducted in support of the filing of a Record of Site Condition (RSC) for the Phase Two Property with the Ontario Ministry of the Environment (MOE). Stantec understands that this Phase Two ESA may be referenced as part of the preparation of a RSC.

The current use of the Phase Two Property is undeveloped land, and the current zoning of the Phase Two Property is General Mixed Use (GM1). Records indicate that the Phase Two Property was historically used for residential, commercial and road right-of-way purposes since at least 1902.

The proposed future use of the property is an Embassy. The proposed redevelopment reportedly will consist of separate commercial and residential buildings.

The Phase Two ESA at Boteler Street included the collection of soil and groundwater samples between July 18 and 30, 2013, through the advancement of test pits and boreholes and the installation of groundwater monitoring wells. Soil and groundwater results obtained in a Phase II ESA of the western portion of the Phase Two Property in April 2013 were also used in this assessment. Six additional boreholes were advanced, three of which were completed as monitoring wells in the bedrock between March 4 and 6, 2014. Groundwater sampling was completed on April 10, and April 24, 2014, from each existing and newly installed monitoring well, where possible. Selected soil and groundwater samples were submitted for laboratory analysis of metals, inorganics, petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs).

Stantec offers the following conclusions with respect to the results of the Phase Two ESA:

- The land use, soil type and other characteristics were considered to select the 2011 Table 3 SCS for residential land use, in a non-potable groundwater situation, with coarse textured soil as the appropriate standards for the assessment of Phase Two Property soil and ground water quality.
- Groundwater measurements recorded at the Phase Two Property ranged from 4.08 mbgs at MW13-14 and 13.97 mbgs at MW14-1 on April 24, 2014. The groundwater flow direction appeared to be in generally a northwesterly direction.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

- Boreholes and test pits advanced during the Phase Two ESA indicated that the overburden consisted generally of heterogeneous fill, underlain in a few locations by a silty clay on the bedrock surface. The bedrock surface was encountered between 2.0 m bgs and 6.1 m bgs;
- Selected soil samples were submitted for laboratory analysis and results indicated that there were exceedances of the residential Table 3 SCS for the following parameters:
 - TP2, TP3, TP4, TP16, TP18, TP28, BH14-4*, BH14-5*: PAHs;
 - TP29: metals
 - TP5, TP7, TP9, TP10, TP11, TP13, TP15, TP17, TP20, TP21, TP24, TP25, TP30: metals, PAHs;
 - TP8: metals, PAHs, EC;
 - TP12, TP19, TP27: PHC, metals, PAHs;
 - MW13-1: SAR, metals and PAHs;
 - BH13-8: EC, SAR, metals and PAHs;
 - MW13-11: EC, PAHs;
 - BH13-9, TP23: EC, SAR; and
 - TP26: PHC.

Note:* - samples were submitted for analysis of PAHs only. Concentrations of other parameters were not analyzed.

- Groundwater samples were submitted for laboratory analysis and results indicated the following exceedances of the Table 3 SCS:
 - PHC F3
 - PHC F4
 - Sodium
- Based on the presence of a dissolution cavity in one monitoring well (MW14-1), it is recommended to conduct a combined hydrogeological and geotechnical investigation to determine the karst dissolution rate, bedrock stability, and subsurface distribution of voids by applying appropriate geophysical techniques;
- The results of the Phase Two ESA confirmed the presence of COCs at the Phase Two Property, and upon review of the APECs identified in the Phase One ESA, concluded that the impacts were most likely derived from on-site activities associated with the fill of unknown quality;

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

- The lateral and vertical extents of the identified soil impacts have been delineated to consist of all the soil from surface to bedrock, across the entire Phase Two Property;
- The lateral extent of the identified groundwater impacts have been delineated to the middle portion of the western half of the Phase Two Property;
- Soil and groundwater quality at the Phase Two Property does not meet the applicable Table 3 SCS, and property-specific standards have not been developed; therefore, additional work (i.e., risk assessment) is required to satisfy the requirements of a RSC.

The statements made in this Executive Summary text are subject to the limitations included in Section 7.0 and are to be read in conjunction with the remainder of this report.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INTRODUCTION
June 27, 2014

2.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) conducted a Phase Two Environmental Site Assessment (Phase Two ESA) of the vacant parcel of land, Part of Lot 3 and Part of Lot 7, RCP 611769, designated as Parts 2, 4, 5, and 6, Plan 4R-26468, Boteler Street, Ottawa, Ontario (the Phase Two Property). The Phase Two ESA was conducted to identify the presence, location, and concentration of contaminants of concern (COC) in soil and groundwater across the Phase Two Property. The Phase Two ESA was conducted in support of the filing of a Record of Site Condition (RSC) for the Phase Two Property with the Ontario Ministry of the Environment (MOE). Stantec understands that this Phase Two ESA may be referenced as part of the preparation of a RSC.

2.1 SITE DESCRIPTION

The Phase Two Property consists of an undeveloped lot north of Boteler Street, east of the United Arab Emirates (UAE) Embassy, west of King Edward Avenue, and south of the on/off ramps to the MacDonald Cartier Bridge in Ottawa, Ontario. A location map is provided in Figure 1 in Appendix B. The Phase Two Property has an approximate area of 0.75 hectares (1.85 acres) and its boundaries are shown on Figure 1 in Appendix B.

The Phase Two Property will have the civic address of 187 Boteler Street once the proposed redevelopment is completed.

The Phase Two Property is legally described as Part of Lot 3 and Part of Lot 7, RCP 611769, designated as Parts 2, 4, 5, and 6, Plan 4R-26468. A survey plan will be provided in Appendix C in subsequent versions of this report.

2.2 PROPERTY OWNERSHIP

The Phase Two Property is currently owned by the City of Ottawa and is currently vacant.

Contact information for the Phase Two Property owner representative and client contact is as follows:

Phase Two Property Owner Representative:

City of Ottawa
Richard Barker
110 Laurier Avenue, 5th Floor West
Ottawa, ON

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INTRODUCTION
June 27, 2014

2.3 CURRENT AND PROPOSED FUTURE USES

The current use of the Phase Two Property is undeveloped land, and the current zoning of the Phase Two Property is General Mixed Use (GM). Records indicate that the Phase Two Property was historically used for residential, commercial and road right-of way purposes since at least 1902.

The proposed future use of the property is an Embassy. The proposed redevelopment reportedly will consist of separate commercial and residential buildings. The land use sensitivity for the proposed future use is considered to be changing to a more sensitive use (i.e., from commercial/road right-of-way to residential/commercial).

2.4 APPLICABLE SITE CONDITION STANDARD

The applicable Ontario Ministry of the Environment (MOE) Site Condition Standards (SCS) for the Phase Two Property were considered to be the Table 3 SCS for Residential/Parkland/Institutional land use in a non-potable groundwater condition with coarse textured soil (MOE, 2011a). The rationale for use of these SCS is provided below.

According to Water Well Information System, searched by EcoLog ERIS, one abandoned water supply well is present approximately 300 m to the west, and cross gradient, of the Phase Two Property. Further, the Phase Two Property, once a building is constructed, will be serviced by the municipal water system of the City of Ottawa which obtains its water from the Ottawa River. Therefore, non-potable groundwater standards were considered to be applicable in the assessment of the Phase Two Property data.

Under O.Reg.153/04, Section 41, a property is to be considered environmentally sensitive if any of the following circumstances exist:

- (1),(a) *the property is,*
 - (i) *within an area of natural significance,*
 - (ii) *includes or is adjacent to an area of natural significance or part of such an area,*
or
 - (iii) *includes land that is within 30 metres of an area of natural significance or part of such an area;*
- (b) *the soil at the property has a pH value as follows:*
 - (i) *for surface soil, less than 5 or greater than 9,*
 - (ii) *for sub-surface soil, less than 5 or greater than 11; or*

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INTRODUCTION
June 27, 2014

(e) a qualified person is of the opinion that, given the characteristics of the property and the certifications the qualified person would be required to make in a record of site condition in relation to the property as specified in Schedule A, it is appropriate to apply this section to the property.

A site sensitivity search conducted by Stantec did not identify any confirmed areas of natural significance on or within 30 metres of the Phase Two Property. The Ministry of Natural Resources in an email dated November 29, 2013, indicated there were no known natural heritage areas within or adjacent to the Site. Possible species-at-risk including Butternut, Chimney Swift, and Barn Swallow were identified for the Phase Two Property study area (a distance of 250 m beyond the property boundaries). However, no species-at-risk were specifically identified on or within 30 m of the Property, and considering the current condition of the Property and use of the adjacent properties within 30 m, no species-at-risk would be expected to be present. Therefore, we have concluded that the Property is not located on or within 30 m of an area of natural significance.

The Phase II ESA report for the property to the west of the Phase Two Property, and the western portion of the Phase Two Property reported that two soil pH samples had been collected at this property, and the soil pH was within the acceptable range of 5 to 9 for each sample. In the current investigation, as reported below, six surface and four subsurface soil samples were analyzed for pH and the results were within the acceptable range of 5 to 9 for surface soil or 5 to 11 for subsurface soil. Accordingly, the Phase Two Property was not considered environmentally sensitive at this time as per the definitions provided in Section 41 of O.Reg.153/04.

Under O.Reg.153/04 Section 43.1, particular SCS are to be applied if any of the following circumstances exist:

- (a) the property is a shallow soil property; or
- (b) the property includes all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.

Under O.Reg.153/04 Section 43.1, a shallow soil property "means a property of which 1/3 or more of the area consists of soil equal to or less than 2 metres in depth beneath the soil surface". Based on the subsurface investigation conducted as part of the current study, it was concluded that the Phase Two Property is not a shallow soil property, as test pit excavations did not identify bedrock above 2 mbgs.

Based on available mapping, the Rideau River is approximately 130 m to the northeast of the Phase Two Property and the Ottawa River is approximately 360 m to the west (see Figure 1 in Appendix B). The Phase Two Property was considered to be situated greater than 30 m from this surface water body. Given this, the Table 3 SCS were considered applicable to the Site.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INTRODUCTION
June 27, 2014

Grain size distribution analyses were completed on two soil samples recovered from a surficial location at the Phase Two Property during the Phase Two ESA. This analysis revealed that 30% and 58% of the particles in the respective samples were greater than 0.075 mm in diameter; therefore, one sample indicated fine/medium soil texture and the other indicated coarse soil texture. Due to the heterogeneous nature of the fill material encountered over the entire Phase Two Property, the conservative approach was taken and all soil was considered to be coarse grained. The results of the grain size analysis are included in the laboratory certificates of analysis in Appendix I.

Given the above site characteristics, and the proposed future use of the Phase Two Property as an embassy with both commercial and residential land uses, Stantec considers the appropriate SCS for this assessment to be the Table 3 SCS for an residential/parkland/institutional (R/P/I) land use in a non-potable groundwater condition with coarse textured soil.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

3.0 BACKGROUND INFORMATION

3.1 PHYSICAL SETTING

Based on a review of topographic mapping (NRC, 1998) and observations made during the Phase I ESA (Stantec, 2013a) and Phase One ESA (Stantec, 2013b) the topography in the area of the Phase Two Property is relatively flat.

Based on previous investigations the inferred groundwater flow direction at the Phase Two Property is considered to be to the northwest/north/northeast towards the Ottawa and Rideau Rivers. It should be noted that the direction of the shallow groundwater flow in localized areas can be influenced by the presence of underground utility corridors and is not necessarily a reflection of regional or local groundwater flow. The ground surface at the Phase Two Property was observed to be vacant land, with sparse vegetation around the property boundaries. The interior of the Site was exposed soil due to the removal of a soil berm. Surface water was anticipated to drain by infiltration or by overland flow toward Boteler Street, located along the southern side of the Phase Two Property (see Figure 1 in Appendix B).

3.2 PAST INVESTIGATIONS

The following environmental and geotechnical reports related to the Phase Two Property were reviewed by Stantec:

- Subgrade Investigation, Ottawa Approach to Proposed MacDonald-Cartier Bridge, Ottawa, Ontario, prepared by H.Q. Golder & Associates Ltd., dated October, 1962 (Golder, October 1962);
- Geotechnical Inventory, King Edward Avenue, Ottawa, Ontario, prepared by Jacques Whitford and Associates Limited, dated February 2001
- Limited Phase I Environmental Site Assessment, King Edward Avenue and Sussex Drive Rights-of-Ways, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated February 2001
- Draft Limited Phase II Environmental Site Assessment, King Edward Ave. Overpass Structures Over the Union Ave. to King Edward Ave. Ramp, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated April 2004;
- Draft Supplemental Phase II ESA, King Edward Avenue Right-of-way (Laurier Avenue East to Boteler Street) and Area of Structures North of King Edward Right-of-Way, Ottawa, Ontario, prepared by Jacques Whitford Limited, dated October 26, 2004

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

- Modified Phase I Environmental Site Assessment, Boteler Street from Dalhousie Street to King Edward Avenue, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated January 2006
- Limited Phase II Environmental Site Assessment, Boteler Street from Dalhousie Street to King Edward Avenue, Ottawa, ON, prepared by Jacques Whitford Environment Limited, dated January 2006
- Soil Sampling Results, UAE Embassy, 125 Boteler Street, Ottawa, Ontario, prepared by Trow Associates Inc, dated April 11, 2006
- Phase I ESA of the property to the west and the western third of the Phase Two Property, identified as parts of Parcel 1 and 2, Lot 7, RCP611769, Ottawa, completed by Stantec dated June 26, 2013
- Phase II ESA of the property to the west and the western third of the Phase Two Property, identified as Parcel 1 and 2, Lot 7, RCP 611769, Ottawa, completed by Stantec dated June 27, 2013; and
- Draft Phase One ESA of the Phase Two Property completed by Stantec dated June 28, 2013.

A summary of relevant information obtained from these reports is provided below.

3.2.1 Subgrade Investigation, Ottawa Approach to Proposed MacDonald-Cartier Bridge, Ottawa, Ontario, prepared by H.Q. Golder & Associates Ltd., dated October, 1962.

The subgrade investigation identified the land between the Ottawa River to the north, Rideau River to the east, Boteler Street to the south and Sussex Avenue to the west, as having a shallow depth of till overburden overlying argillaceous Ordovician limestone bedrock. The bedrock was found to slope down from Sussex Avenue to the Rideau River. Groundwater was identified to be within the overburden. Fill material was found beneath the railway tracks across the property consisting of silty sand with gravel, cobbles and trace organic matter.

3.2.2 Limited Phase I Environmental Site Assessment, King Edward Avenue and Sussex Drive Rights-of-Ways, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated February 2001.

The site assessed in this Limited Phase I ESA comprised: the King Edward Avenue right-of-way from Laurier Avenue to the Ottawa River; Sussex Drive right-of-way from Alexander Street to Bruyere Street including Green Island; areas enclosed by Boteler Street to the south, Sussex Drive to the northwest and the Rideau River to the east; Cathcart Street; Rose Street; and Bruyere Street east of King Edward Avenue. Several criteria were used to qualitatively rank the level of



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

environmental concern associated with activities identified on the properties within the area of assessment. Three properties positioned within the vicinity of the Site were identified with potential environmental concerns. These include:

- former 169 ½ Boteler Street, occupied in the 1950s to late 1960s by Peter's Garage, the 1956 FIP shows an underground gasoline storage tank;
- east side of former Cumberland Street, between McTaggart Street and Boteler Street, occupied by JG Butterworth coal yard in the 1920s;
- 82 King Edward Avenue, occupied in the 1960s by Ken's Body Shop.

3.2.3 Geotechnical Inventory, King Edward Avenue, Ottawa, Ontario, prepared by Jacques Whifford and Associates Limited, dated February 2001.

The Geotechnical Inventory was completed as part of the Environmental Assessment study, also conducted by Jacques Whifford in 2000. Bedrock was identified as sublithographic to fine crystalline limestone with interbeds of calcarenite and shale of the Lindsay Formation. Depth to bedrock varied from 1 m along the Ottawa River to over 15 m east of King Edward. The soil stratigraphy consisted of glacial till, silty clay, sand, organic deposits and fill. Fill was found in large deposits within the study area, with typical depths of 1 to 3 metres. Groundwater elevations were found to be shallow, between 2 and 5 m below ground surface.

3.2.4 Draft Limited Phase II Environmental Site Assessment, King Edward Ave. Overpass Structures over the Union Ave. to King Edward Ave. Ramp, Ottawa, Ontario, prepared by Jacques Whifford Environment Limited, dated April 2004.

The Limited Phase II ESA was completed in conjunction with a geotechnical investigation in the vicinity of the proposed overpass structures to be located northwest of Boteler Street. The laboratory analytical results were compared to the Ontario Ministry of the Environment Table B criteria provided in the Guideline for Use at Contaminated Sites in Ontario, which was applicable at the time of the assessment. Soil with concentrations of polycyclic aromatic hydrocarbons (PAHs) exceeding the criteria applicable at the time was identified near the eastern corner of the Phase One Property. Fill material of various thicknesses was found within the study area, with a depth of 7 m reported for BH4-1.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

3.2.5 Draft Supplemental Phase II ESA, King Edward Avenue Right-of-way (Laurier Avenue East to Boteler Street) and Area of Structures North of King Edward Right-of-Way, Ottawa, Ontario, prepared by Jacques Whitford Limited, dated October 26, 2004.

The site of this Supplemental Phase II ESA comprised a 1.4 km section of King Edward Avenue between Laurier Avenue and Boteler Street, and lands northwest of Boteler Street. Boreholes and monitoring wells were installed along King Edward Avenue to assess soil and groundwater conditions. The laboratory analytical results were compared to the soil quality standards provided by the MOE in the Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, dated March 9, 2004, which were applicable at the time of the assessment. Soil with concentrations of PAHs exceeding the standards applicable at the time was identified near the eastern corner of the Phase One Property. Fill material of various thicknesses was found within the study area, with none reported for BH4-31 and 1.9 m reported for BH4-12, located east of BH4-31.

3.2.6 Modified Phase I Environmental Site Assessment, Boteler Street from Dalhousie Street to King Edward Avenue, Ottawa, Ontario, prepared by Jacques Whitford Environment Limited, dated January 2006.

The focus of the Modified Phase I ESA was the Boteler Street right-of-way (ROW), between Dalhousie Street and King Edward Avenue and a 250-metre wide area beyond the subject ROW in all directions. Based on the findings of the assessment, several historical on-site and off-site activities were identified as posing an environmental concern to the current Phase One ESA Property. These activities include:

- JG Butterworth Coal Storage Yard, located on the north corner of the Phase One Property in the 1920s, contaminants of concern include PHC, PAH, and metals;
- Peter's Garage, located west of the Site between 1950 and 1960, contaminants of concern include PHC, VOCs, and metals; and
- Ken's Body Shop, located to the southeast of the Phase One Property in the 1960s, contaminants of concern include, PHC, VOCs and metals.

3.2.7 Limited Phase II Environmental Site Assessment, Boteler Street from Dalhousie Street to King Edward Avenue, Ottawa, ON, prepared by Jacques Whitford Environment Limited, dated January 2006.

Boreholes and monitoring wells were installed along Boteler Street to assess soil and groundwater conditions based on the environmental concerns identified in the Modified Phase I ESA, as discussed. The laboratory analytical results were compared to the soil quality standards provided by the MOE in the Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

Environmental Protection Act, dated March 9, 2004, which were applicable at the time of the assessment. Soil with concentrations of PAHs and sodium absorption ratio exceeding the standards applicable at the time was identified in the vicinity of the Phase One Property. Fill material was observed at depths ranging from 1.2 to 2.1 metres below grade.

3.2.8 Soil Sampling Results, United Arab Emirates (UAE) Embassy, 125 Boteler Street, Ottawa, Ontario, prepared by Trow Associates Inc., dated April 11, 2006.

The investigation consisted of the collection of four (4) soil samples from the walls of the excavation undertaken in preparation for construction on this property, now occupied by the Embassy of the UAE. Approximately two-thirds of the property was excavated to bedrock; therefore, no floor samples were submitted for laboratory analysis. The results of the laboratory analyses were compared to the Table 3 Standards provided in the Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, dated March 9, 2004, which were applicable at the time of the assessment. No exceedances were identified in the assessment. This report formed the basis of the RSC filed with the MOE for the UAE Embassy.

3.2.9 Phase I ESA, Vacant Land Parcels, Boteler Street, Parcel 1 and 2, Lot 7, RCP611769, Ottawa, Ontario, prepared by Stantec Consulting Ltd., dated June 26, 2013.

Stantec conducted a Phase I ESA of two triangular parcels of undeveloped land to the west of and in the southwest corner of the Phase Two Property in the spring of 2013 in support of a land transfer. Parcel 1, owned by the City of Ottawa, is a triangular parcel of land bound by King Edward Avenue to the north, undeveloped land owned by the City of Ottawa to the east, the UAE Embassy grounds to the south, and an undeveloped boulevard for the King Edward Avenue off-ramp to the west. Parcel 2, owned by the UAE, is a triangular parcel of land bound by the undeveloped land owned by the City to the north and east, Boteler Street to the south, and the UAE Embassy to the west. The site was approximately 0.25 hectares (0.62 acres) in size. A mound of soil was present on the northeast section of Parcel 1, reportedly excess soil and like material from the King Edward Renewal project temporarily placed on the parcel and subsequently landscaped. Based on the findings of the assessment, several historical on-site and off-site activities were identified as posing an environmental concern to the Phase Two Property, the focus of the current Phase Two ESA. These activities include:

- Impacted soil from the King Edward Renewal Project present as a berm along the northern boundary of the Phase Two Property, and to the west of the Phase Two Property;
- Canadian Pacific Railway lines that historically extended in an east to west direction along McTaggart Street, approximately 10 m to the north of the Phase Two Property;

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

- Presence of a gasoline UST at 121 Boteler Street, to the west of the Phase Two Property;
- Historical neighbouring property uses included a variety of operations of concern, such as: coal storage yards (northwest and east of the Phase Two Property), gasoline service stations with underground storage tanks (north, west and south of the Phase Two Property), building material storage and warehouses (north and west of the Phase Two Property), automotive repairs (south and east of the Phase Two Property), commercial printing services (southwest of the Phase Two Property), and a train yard (west of the Phase Two Property).

3.2.10 Phase II ESA, Vacant Land Parcels, Boteler Street, Parcel 1 and 2, Lot 7, RCP 611769, Ottawa, Ontario, prepared by Stantec Consulting Ltd., dated June 27, 2013.

Boreholes and monitoring wells were installed over two triangular parcels of land to assess soil and groundwater conditions based on the environmental concerns identified in the Phase I ESA, as discussed above. The laboratory analytical results were compared to the soil quality standards provided by the MOE in *the Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, dated April, 2011, which were applicable at the time of the assessment. Soil with concentrations of PHCs and PAHs exceeding the standards applicable at the time was identified in the vicinity of the Phase Two Property. Concentrations of the contaminants of concern in the groundwater samples collected from the monitoring wells were below the MOE standards.

3.2.11 Draft Phase One ESA, Parts 2, 4, 5, and 6 of Plan 4R-26468, Part of Lot 3 and Part of Lot 7 RCP 611769, Ottawa, Ontario, prepared by Stantec Consulting Ltd., dated June 28, 2013.

Stantec recently completed a Phase One ESA for the Phase Two Property. During the Phase One ESA site visit, completed on April 22, 2013, Stantec identified potential environmental concerns to the Phase Two Property. A list of potentially contaminating activities (PCAs) that were investigated as contributing to areas of potential environmental concern (APECs) at the Phase Two Property is provided below. Numbers in brackets, where provided, refer to the PCA item number in Table 2, Schedule D of O.Reg.153/04.

- Importation of Fill Material of Unknown Quality (#30) – Soil of unknown quality across the entire Phase Two Property, from the King Edward Renewal project;
- Rail yards, tracks, and spurs (#46) – former railway tracks were present along the former McTaggart Street north of the Phase Two Property;

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION
June 27, 2014

- Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles (#27), Gasoline and Associated Product Storage in Fixed Tanks (#28) – Former gasoline UST and former garage to the west of the Phase Two Property;
- Commercial Autobody Shops (#10) – Former autobody garage to the southeast of the Phase Two Property; and
- Although the MOE did not assign a PCA number to a coal storage yard, it was of the QP_{ESAS} opinion that it should be identified as a PCA – former coal storage yard on the northeast corner of the Phase One Property.

Stantec recommended that a Phase Two ESA be conducted to confirm the presence or absence of environmental impacts to the soil and groundwater on the Phase Two Property.

Using the information provided in this Phase One ESA, the physical characteristics/pathways identified in Table 3-1 were used to develop a Conceptual Site Model and were evaluated to assess whether or not identified PCAs contributed to an APEC at the Phase Two Property.

Table 3-1 Conceptual Site Model Physical Characteristics/Pathways

Physical Characteristics/Pathways	Description
Subsurface Soils	Based on an available surficial geology map (NRC, 1998) the native surficial soils in the Site area consisted of glaciomarine deposits of fine textured silt, and clay with sand and gravel on Paleozoic terrain. Previous subsurface investigations identified silty sand and gravel fill over native silty clay. (Stantec, 2013b)
Bedrock	Based on an available bedrock geology map (EMR, 1976) bedrock in the area of the Site consists of Paleozoic limestone with shale partings of the Lindsay Formation. The depth to bedrock encountered during previous investigations ranged between 1.9 and 4.9 m below grade (Stantec, 2013b)
Anticipated Groundwater Flow Direction	Based on an available topographic map (NRC, 1998) and the observed site topography, regional surface drainage (and anticipated shallow groundwater flow direction) is likely to the north/northeast. It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground utility corridors and is not necessarily a reflection of regional or local groundwater flow or a replica of the topography of the Site or immediate area.
Underground Utilities	No evidence of underground utilities or services was observed at the Phase One Property during the Site reconnaissance. Based on previous environmental investigations underground hydro is present in the southwest corner of the Phase One ESA Property.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

BACKGROUND INFORMATION

June 27, 2014

Based on the information gathered and observations made, the Phase One ESA identified PCAs on or in the vicinity of the Phase Two Property that contribute to APECs at the Phase Two Property. Table 3-2 summarizes the APECs identified at Phase Two Property. Figure 1 in Appendix B illustrates the locations of the APECs.

Based on the findings of the Phase One ESA, it was Stantec's opinion that additional Phase Two ESA work was required.

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

BACKGROUND INFORMATION

June 27, 2014

Table 3-2 Summary of Areas of Potential Environmental Concern to Phase Two Property

APEC	Location of APEC on Phase Two Property	PCA	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted
APEC #1	Across entire Phase Two ESA Property	30. Importation of Fill Material of Unknown Quality	On-site	PAHs, PHCs, metals	Soil and groundwater
APEC #2	Northeast corner	Based on QP _{ESA} opinion this is a PCA, even though the MOE did not assign it a PCA number.	On-Site	PAHs, PHCs	Soil and groundwater
APEC #3	Northern Property Boundary	46. Rail Yards, Tracks and Spurs	Off-Site	PAHs, PHCs, metals	Soil and groundwater
APEC #4	Southwestern property boundary	27. Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles 38. Gasoline and Associated Product Storage in Fixed Tanks	Off-Site	PAHs, PHCs, metals, VOCs	Soil and groundwater
APEC #5	Southeastern property boundary	10. Commercial Autobody Shops	Off-site	PAHs, PHCs, metals, VOCs	Soil and groundwater

PHCs – Petroleum hydrocarbons

VOCs – Volatile organic compounds

PAHs – Polycyclic aromatic hydrocarbons

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

SCOPE OF THE INVESTIGATION
June 27, 2014

4.0 SCOPE OF THE INVESTIGATION

4.1 OVERVIEW OF SITE INVESTIGATION

The Phase Two ESA was conducted to identify the presence and location of COCs that could potentially be associated with APECs identified at the Phase Two Property.

The Phase Two ESA included a surficial soil sampling program through the advancement of test pits conducted between July 23 and 24, 2013. A subsurface soil sampling program was conducted through the advancement of seven boreholes to the bedrock surface. Five of the boreholes were extended into the bedrock and completed as monitoring wells. One week later, groundwater samples were collected from two of the newly installed monitoring wells. Three of the monitoring wells installed in July 2013 did not have sufficient water to complete the groundwater sampling. Six additional boreholes were advanced, three of which were completed as monitoring wells in the bedrock between March 4 and 6, 2014. Groundwater sampling was completed on April 10, and April 24, 2014, from each existing and newly installed monitoring well, where possible. The Phase Two ESA sampling and analysis plan is provided in Appendix D. All work during the Phase Two ESA was observed by Stantec staff.

4.2 MEDIA INVESTIGATED

Soil sampling was completed at 26 test pit locations, five borehole locations, and nine monitoring well locations on the Phase Two Property. Groundwater sampling was attempted at the 12 installed monitoring wells located across the Phase Two Property. The soil and groundwater sampling locations are indicated on Figure 1, in Appendix B. The field program is described in more detail in Section 5.0.

Selected soil and groundwater samples were submitted to an independent laboratory, Paracel Laboratories Ltd. (Paracel) of Ottawa, Ontario, for chemical analysis of concentrations of one or more of the following parameter suites:

- Metals and inorganic parameters, including free cyanide, electrical conductivity (EC), sodium adsorption ratio (SAR), and pH;
- Petroleum hydrocarbon fractions 1 through 4 (PHC F1-F4), benzene, toluene, ethylbenzene, and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Volatile organic compounds (VOCs); and
- Polychlorinated biphenyls (PCBs).

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

SCOPE OF THE INVESTIGATION
June 27, 2014

Parcel's accreditation and ability to perform these analyses is discussed further in Section 5.11.

4.3 PHASE ONE CONCEPTUAL SITE MODEL

In assessing and developing the conceptual site model for the Phase Two Property at the time of the Phase One ESA, the site specific physical characteristics/pathways were evaluated in order to assess whether or not potentially contaminating activities would be contributing to APECs, as summarized in Tables 3-1 and 3-2.

4.4 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

Test pits TP1 and TP6 were not completed, as a land transfer had not yet been completed transferring land from the neighbouring property to the Phase Two Property; therefore, access was not granted and sampling was not completed. This was not a concern as two monitoring wells were installed during the Phase II ESA in the spring of 2013 and soil data from that report could be reviewed for the southwest corner of the Phase Two Property. Test pit TP30 and MW13-12 were moved west due to a steep slope on the east side of the Phase Two Property; therefore, TP22 was removed. These adjustments were not considered to significantly affect the interpretation of soil or groundwater conditions at the Phase Two Property. No other deviations from the sampling and analysis plan for the Phase Two ESA (presented in Appendix D) were noted.

4.5 IMPEDIMENTS

There was denial of access to the southwest corner of the Phase Two Property, as a land transfer between the neighbouring embassy and the City of Ottawa had not been completed; therefore, no surficial sampling occurred at the southwest corner. Soil and groundwater data from the previously installed monitoring wells was used. The overall objectives of the investigation and assessment were met.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

5.0 INVESTIGATION METHOD

5.1 GENERAL

The investigation methodology was completed in general accordance with the Province of Ontario's "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" (MOE, 1996) and O.Reg.153/04.

Twenty seven surficial soil samples and thirty samples from soil at depth were obtained from the Phase Two Property on July 23 and 24, 2013, during test pitting activities. Boreholes were advanced on April 12, 15 and 17, 2013, during a previous investigation; on July 18 and 25, 2013, to depths ranging from 3.14 mbgs to 4.85 mbgs, and on March 4 to 6, 2014, ranging in depth from 2.13 mbgs to 5.48 mbgs. Select boreholes were advanced into bedrock to depths ranging from 6.4 m to 15.7 mbgs and monitoring wells were installed in the bedrock. Sampling locations are presented on Figure 2 in Appendix B. Soil samples were collected at each location during advancement as described in the following sections. Groundwater was collected from nine monitoring wells (MW13-1, MW13-2, MW-13-10, MW13-11, MW13-13, MW13-14, MW14-1, MW14-2, and MW14-3) that contained sufficient water to complete the sampling on one or more attempts.

Soil and groundwater samples were placed into laboratory-supplied containers with ice. The samples were subsequently submitted to Paracel in Ottawa, Ontario, with Chain of Custody documentation for analysis of metals, inorganic parameters, PHCs, PAHs, VOCs, and PCBs.

A summary of all soil and groundwater analyses completed for the current Phase Two ESA is provided in Appendix D.

5.2 TEST PITTING

Prior to test pit advancement, underground utilities were marked by public and private underground utility locators. Underground utilities or services were observed at the Phase Two Property included: a storm sewer that runs north across the west side of the Phase Two Property, a sanitary sewer that runs north-south across the center of the Phase Two Property, and abandoned wires were traced at the northwest corner of the Phase Two Property, apparently abandoned hydro wires.

Twenty seven surficial soil samples were obtained from the top 0.5 m of the test pits by Stantec staff on July 23 and 24, 2013. Sample collection is described in Section 5.4. Test pit locations are presented on Figure 2 in Appendix B and the rationale for each location is provided in Appendix D.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

Tomlinson Group was retained by the City to undertake the test pitting program at the Phase Two Property on July 23 and 24, 2013. Stantec staff was present during all activities at the Phase Two Property. Twenty seven test pits were advanced in the overburden using an excavator to total depths of approximately 2.0 mbgs to 4.0 mbgs. The test pits were terminated on inferred bedrock, with the exception of TP14 which was terminated due to material caving into the test pit.

Soil samples were manually collected from each test pit from either the sidewalls or base of the test pit, or directly from the teeth of the excavator bucket. General soil conditions were assessed through observation of soil samples. All surficial samples were collected from the upper 0 m to 0.5 mbgs. Deeper samples from the test pits were collected at representative locations near observed changes in stratigraphy. An additional sample was typically collected at the base of the test pit, at approximate depths from 2.0 mbgs to 4.0 mbgs.

Sample collection is described in Section 5.4. Test pit locations are presented on Figure 2, Appendix B, and test pit logs are provided in Appendix E.

5.3 DRILLING

Soil samples from the four previously drilled boreholes and 13 boreholes advanced as part of the Phase Two ESA were recovered using direct push methods with a disposable plastic liner and all of the recovered soil samples were screened in the field using a RKI Eagle portable hydrocarbon surveyor. The 12 monitoring wells were installed by a licensed driller in accordance with Ontario Regulation 903 (as amended).

The 17 boreholes advanced at the Site were completed using a track-mounted drill rig equipped with a Geoprobe direct push drill supplied by Strata Soil Sampling Inc. Soil samples were recovered continuously from the boreholes at approximately 0.75 m intervals using a geoprobe sampler. Once the sampling tube was removed, the auger and casing were advanced down to the sampling depth. The auger has a 762 mm (3 in.) outside diameter. In boreholes where no monitoring well was installed, the borehole was filled with granular bentonite chips. The granular bentonite chips were poured slowly down the hole in lifts of 0.15 m to 0.30 m. As the drilling equipment was removed, the borehole was continuously filled with bentonite chips.

Soil samples were collected approximately every 0.75 m from the boreholes from the removable plastic liner of the sampling tube. Samples were collected from surface to above the bedrock, depths ranging from 3.14 mbgs to 6.1 mbgs.

Observations of soil type, grain size, moisture, and visual or olfactory evidence of environmental impacts in the field were noted on the Stantec borehole log field forms. Test pit, borehole and monitoring well logs are presented in Appendix E. A description of the soils encountered is

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

provided in Section 6.1.1. Samples were collected using nitrile gloves and disposable plastic liners in the drilling equipment.

Where sufficient sample volume was available following the initial examination, each soil sample for potential laboratory analysis of volatile parameters (i.e., PHCs or VOCs) was split into two representative portions. One portion was placed into a sealable plastic bag for headspace analysis of combustible gas concentrations (see Section 5.4), and the other portion was placed into laboratory supplied jars.

5.4 FIELD SCREENING MEASUREMENTS

Where sufficient volume permitted, soil samples collected during the test pit and drilling program for potential analysis of PHCs were first screened in the field using an RKI Eagle combustible gas meter (Eagle). The Eagle is a battery-powered, portable instrument designed to detect and measure combustible gas concentrations (CGC) in the atmosphere. It is equipped with two ranges of measurement, reading concentrations in the parts per million by volume (ppmv) (5 to 500 ppmv) range or in percent lower explosive limit (0 to 100% LEL). LEL is a measure of the explosivity of the atmosphere, with 100% LEL being the minimum concentration of gas required for ignition. The Eagle is precise to within $\pm 5\%$ of the reading (in the mode in which the instrument is calibrated). The equipment was calibrated daily according to the manufacturer's specifications. Calibration consists of exposing the instrument to a gas sample with a known concentration and adjusting the electronic circuitry to generate a display reading equal to the concentration of the calibrating gas. Hexane gas was used to calibrate the Eagle. Prepared gas mixtures in pressurized disposable cylinders and calibration accessories were used.

Each of the recovered soil samples was visually classified and screened in the field for CGC using the Eagle, where sufficient sample volume permitted. To obtain a measurement, the probe of the Eagle was inserted into the headspace of the plastic bag and the soil was gently agitated. The highest CGC observed during a 30 second period was recorded. CGC are presented on the test pit and borehole/monitoring well logs in Appendix E. The field screening measurements were used to assist in selecting soil samples for laboratory analysis. All field screening methods completed in the field during the Phase Two ESA were in general accordance with Stantec's standard operating procedures.

The selection of soil samples submitted for analysis was based on physical evidence of odours/staining, headspace screening analysis, site stratigraphy and hydrogeology (e.g., presence of fill, location of the water table), the nature and location of the APEC, anticipated contaminant behavior, and study objectives.

The depth to ground water and the presence or absence of light non-aqueous phase liquids (LNAPLs) was measured in all monitoring wells using a Heron Interface H-Oil 30m Interface Probe (interface probe). The interface probe can detect and measure LNAPL (conductivity less than 50 $\mu\text{S}/\text{cm}$) and dense non-aqueous phase liquids (DNAPL) (conductivity greater than 50 $\mu\text{S}/\text{cm}$).

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

The sensor accuracy is 1/200 ft or 1.0 mm. The calibration standards for the interface probe are recommended to be annually and are to be completed by the manufacturer.

Water quality parameters were measured in the field during the water sampling program using the Horiba U-52. The Horiba U-52 simultaneously measures dissolved oxygen, conductivity, temperature and pH. The sensor accuracies for the Horiba U-52 are as follows:

- The accuracy for measuring dissolved oxygen for 0 to 20 mg/L is ± 0.2 mg/L; 20 to 50 mg/L is ± 0.5 mg/L;
- The accuracy for measuring temperature is ± 0.3 °C;
- The accuracy for measuring conductivity is $\pm 1\%$ of the reading; and
- The accuracy for measuring pH is ± 0.1 units.

All field screening methods completed in the field during the Phase Two ESA were in accordance with the standard operating procedures.

5.5 GROUNDWATER: MONITORING WELL INSTALLATION

Monitoring wells were installed in 12 of the boreholes on the Phase Two Property, four during the previous Phase II ESA, and eight during the Phase Two ESA. One monitoring well contained a karst cavity and the well with screen and sand pack could not be installed. A packer was installed and solid PVC riser with bentonite seal was then installed from the top of the packer to surface. Evidence of the karst cavity is present in still photographs taken from a down hole video in **Appendix H**. The monitoring wells were constructed using a 31 mm diameter polyvinyl chloride (PVC) monitoring well and No.10 slot PVC well screens, with Type 2 silica sand backfill. The annular space between the monitoring well and formation was backfilled with a bentonite slurry to prevent hydraulic connection within the borehole. The monitoring wells were installed to depths ranging from 6.40 mbgs (MW13-1 and MW13-2) to 15.70 mbgs (MW14-2).

All of the monitoring wells were completed with a flush mounted steel protective casing and were secured with a lockable j-plug cap inserted into the riser pipe. Monitoring well construction details are provided in Table 1, **Appendix A** and on the monitoring well logs in Appendix E.

To reduce the potential for cross contamination during monitoring well installation, the following actions were completed:

- The presence of the bentonite seal reduced the likelihood of surface water infiltrating to the ground water through the monitoring well annulus;
- Only new materials were used, which were factory-cleaned and delivered to the Phase Two Property wrapped in plastic;

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

- New nitrile gloves were worn when handling well screen and riser materials;
- No PVC cements, solvents or lubricants were used in the construction of the wells; and
- The top of the well was covered using a PVC slip cap to prevent filter pack sand, bentonite, and backfill material from entering the well pipe during the well installation activities.

All of the monitoring wells were developed using the following procedure. The initial water level in each monitoring well was measured from top of pipe and the depth to the bottom of the well. All of the information was recorded on Stantec field forms. The volume of water contained in the well casing (i.e., casing volume) was calculated using the inside diameter of the casing, total depth, and a measurement of the static water level in the well. Water was purged manually from each well using dedicated Waterra™ polyethylene plastic tubing and foot valves. Development took place across the entire screened interval in the monitoring well. The volume of fluid purged from each well was measured using a calibrated bucket and the volumes were recorded. Development continued until a minimum of three well volumes were removed from the well or until the wells went dry. Due to the low volumes of water at the Phase Two Property, Stantec staff was only able to remove a minimum of one well volume during well development at each monitoring well. As such, the monitoring wells were pumped dry and a low flow sampling method was employed for the groundwater sampling activities (see Section 5.8).

Two monitoring wells (MW13-3 and MW13-7) were decommissioned in June 2013 due to a lack of groundwater.

5.6 GROUNDWATER: LEVEL MEASUREMENTS

Following monitoring well development and recovery, the depth to ground water and the presence or absence of light non-aqueous phase liquids (LNAPLs) was measured in all monitoring wells using a Heron Interface H-OIL 30m Interface Probe (interface probe) on July 25, 26, and 31, 2013, April 10, 2014, and April 24, 2014. The interface probe can detect and measure LNAPL (conductivity less than 50 $\mu\text{S}/\text{cm}$) and dense non-aqueous phase liquids (DNAPL) (conductivity greater than 50 $\mu\text{S}/\text{cm}$). The sensor accuracy is 0.001 m. The calibration standards for the interface probe are recommended to be completed annually and are to be completed by the manufacturer.

Water levels were measured to the nearest 0.001 m. The electrode was slowly lowered into the well until the meter emitted an audible sound indicating that the electrode had contacted water. The depth to water from the reference point of the well was read from the graduated tape of the water level meter and recorded on Stantec field forms. Between monitoring locations, the interface probe was cleaned with a solution of phosphate-free detergent, followed by a distilled water rinse, a methanol rinse of the tape portion that contacted ground

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

water, and a final distilled water rinse. Water level elevations are presented in Table 2 in Appendix A and on the borehole logs presented in Appendix E.

5.7 GROUNDWATER FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

Field parameter measurements, comprising pH, dissolved oxygen, electrical conductivity and temperature, were collected during monitoring well development and purging using a Horiba U-52 multi-meter. The multi-meter was calibrated prior to use according to the manufacturer's specifications using the appropriate calibration standards. The meter can detect pH from 0 to 14 pH units, dissolved oxygen from 0 to 50.0 mg/L, electrical conductivity from 0 to 100 mS/cm and temperature from -10°C to 55°C, with an accuracy of ± 0.01 pH unit, ± 0.2 mg/L, $\pm 1\%$ F.S (factory standard) and $\pm 0.3^\circ\text{C}$, respectively.

5.8 GROUNDWATER: SAMPLING

Four groundwater sampling events were completed at the Phase Two Property: MW13-1 and MW13-2 were sampled on April 22, 2013, and MW13-11 and MW13-14 were sampled on July 31, 2013. MW13-1 and MW13-2 were not sampled on July 31, 2013, as Stantec did not have permission to access the land. Nine monitoring wells (MW13-1, MW13-2, MW13-10, MW13-11, MW13-13, MW13-14, MW14-1 to MW14-3) were sampled on April 10 and 11, 2014. Four monitoring wells (MW13-10, MW13-13, MW14-1 and MW14-3) were sampled on April 24, 2014. Some wells could not be sampled on some occasions as either the wells were dry or they could not be located.

All of the monitoring wells (MW13-1, MW13-2, MW13-10, MW13-11, MW13-13, MW13-14, MW14-1, MW14-2, MW14-3) were sampled on April 10 and 11, 2014, using the procedure described below, with the exception of MW13-10, MW13-13, MW14-1, MW14-2, and MW14-3 which is discussed further below. However, based on high sediment levels in the samples collected from MW13-10, MW14-1 and MW14-3, an additional round of groundwater sampling was conducted on April 24, 2014, from MW13-10, MW14-1 and MW14-3 which included collecting two samples from each monitoring well to be submitted for laboratory analysis of PAHs (one to be analyzed unfiltered and one to be analyzed after filtering by the lab).

Well development of the monitoring wells was difficult due to the limited amount of water encountered in the limestone bedrock at the Phase Two Property. At minimum only one well volume was purged from the monitoring well during well development. As such, Stantec staff employed the use of low flow purging and sampling procedures for groundwater sampling activities, which minimizes the drawdown of water in a well, and the mixing or disturbance of the standing water within the well, by removing water from a discrete depth within the well. A Geopump™ peristaltic pump with high density polyethylene (HDPE) tubing was used to pump the water from the middle of the well screen at a constant rate. New tubing was used at each well to prevent cross contamination.



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

The low flow procedure was used at all accessible monitoring wells at the Phase Two Property for the ground water monitoring and sampling programs, and was based upon the United States Environmental Protection Agency (US EPA) low flow/minimal drawdown well purging protocol, which is outlined in the document entitled *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (US EPA, 1996).

The US EPA low flow purging protocol consists of pumping water from the midpoint of the well screen at a steady rate of 100 mL/min. Water levels are to be measured frequently to ensure that less than 0.091 m of drawdown occurs. If the measured drawdown is less than 0.091 m, then the pumping rate can be increased up to a maximum rate of 500 mL/min. During purging, field parameters are to be measured at five minute intervals until they have stabilized. Stabilization of the field parameters is defined by the US EPA as follows:

- ± 0.1 units for pH;
- $\pm 3\%$ for specific conductance;
- ± 10 mV for oxidation-reduction potential (ORP); and
- $\pm 10\%$ for temperature, turbidity and dissolved oxygen.

If the stabilization criteria are not met before three well volumes are purged, then a maximum of five well volumes should be purged before a ground water sample can be collected. The stabilization criteria were met at all accessible monitoring wells at the Phase Two Property during the April 10 and 11, 2014, sampling event, prior to ground water sample collection with the following exceptions: MW13-10 the water was too deep to sample with low flow techniques; MW13-13 was purged dry and did not recover; MW14-1 sampled from the large void using a bailer; MW14-2 the drawdown exceeded 10 cm during low flow sampling; MW14-3 the water was too deep to sample with low flow techniques. During the April 24, 2014 sampling event MW14-1 was sampled with a bailer, MW14-3 was purged by hand then sampled with a bailer, and MW13-10 was sampled using a bailer due to limited water. Limited water was found in MW13-10 and MW13-13 on two occasions in April 2014, so the groundwater sampled was not analyzed for all parameters.

Following purging, groundwater samples were collected by transferring water from the HDPE tubing into the appropriate pre-labeled laboratory-supplied sample containers. Where appropriate, the laboratory placed preservative into the sample containers prior to shipping them to Stantec. Groundwater samples requiring filtration (i.e., metals) were field filtered using a high capacity, disposable 0.45 μm (micron) in-line filter, through which groundwater was pumped and then carefully allowed to flow into the sample containers.

After collection, the groundwater samples were carefully packed in insulated sample coolers containing ice. A chain-of-custody form was completed and included in each cooler prior to transportation of the samples to Paracel.



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

5.9 RESIDUAL MANAGEMENT PROCEDURES

During the April 2013 drilling and the July 2013 drilling and test pit excavation programs, the generated soil cuttings were left on the Phase Two Property for subsequent removal by Tomlinson to another City owned property. During the March 2014 drilling program, the excess soil cuttings were left on-site.

Water generated through well development and purging activities was deposited into 205 L drums and left on the Phase Two Property for subsequent disposal.

5.10 SEDIMENT: SAMPLING

Sediment was not present in the areas of potential environmental concern at the Phase Two Property, and was therefore not included in the sampling and analysis plan for the Phase Two ESA.

5.11 ANALYTICAL TESTING

Paracel was the laboratory used to complete all of the analytical testing associated with the Phase Two ESA. All of the submitted soil and groundwater samples were submitted and analyzed at the laboratory located at 2319 St. Laurent Boulevard, Ottawa, Ontario. The Paracel laboratory in Ottawa is accredited by the Standards Council of Canada (SCC) in cooperation with the Canadian Association for Laboratory Accreditation (CALA); therefore, it was concluded that Paracel met the accreditation requirements outlined in Section 47 of O.Reg.153/04 (MOE, 2011b).

The soil and groundwater sampling analytical results are summarized in Tables 3 to 7 in Appendix A. The analytical data were compared with the Table 3 SCS. The soil analytical results were also compared to the Table 1 SCS for soil management purposes only. The soil samples collected from BH14-4, BH14-5, and BH14-6 were submitted for bulk and leachate analysis of PAHs for risk assessment purposes. The groundwater samples collected from MW13-10, MW14-1 and MW14-3 on April 24, 2014, were submitted to the lab with two samples from each well: one sample was to be filtered by the laboratory prior to analysis to remove any sediment, and the second sample was to be analyzed with the sediment present to confirm that the exceedances measured in the April 10, 2014, samples were due to sediment in the sample and not dissolved concentrations of PAHs.

Appendix I presents copies of the laboratory Certificates of Analysis and chain-of-custody forms. Included with the laboratory reports are the analytical methods used and the laboratory reportable detection limits (RDLs).

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

5.12 SURVEYING

The coordinates of the test pits, boreholes and monitoring wells at the Phase Two Property were surveyed by Stantec on July 31, 2013, and on April 24, 2014 using a high precision digital Trimble Geo XO GPS unit. All horizontal positioning results are referred to the UTM NAD83 (CSRS), Zone 18 datum. The vertical elevations were measured relative to mean sea level using the Trimble unit with an accuracy of 0-0.05 m in both the horizontal and vertical measurements. The April 9, 2014, surveying of the 2014 monitoring wells was completed using a surveying level. A 20 centimetre discrepancy between the surveyed elevations of the 2013 monitoring wells identified the need to resurvey all of the wells with the Trimble unit on April 24, 2014.

5.13 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

The overall data quality objective (DQO) for the investigation was to collect data that were precise, accurate, reproducible, complete, and suitable for comparison with the Table 3 SCS.

All soil and ground water samples were handled in accordance with the required analytical protocol, including holding time, preservation method, storage requirements and container type. In addition, a laboratory Certificate of Analysis was received for each soil and ground water sample submitted for analysis, and all laboratory Certificates of Analysis and analytical reports complied with the requirements under subsection 47 (3) of O.Reg. 153/04, as amended (MOE, 2011b). Copies of the laboratory Certificates of Analysis in their entirety are included in Appendix I.

Each sample was labeled with a unique ID, packed into coolers with ice, and transported to Paracel under chain-of-custody documentation. In order to meet the DQO, QA/QC procedures were incorporated into both field and laboratory methods. Efforts were made during sampling to reduce the potential for contamination so as to obtain representative samples. Accordingly, soil and groundwater sampling was completed using a new pair of disposable nitrile gloves for each sample.

The equipment cleaning procedures followed during all sampling were as follows.

- All non-disposable field equipment was cleaned prior to initial use at the Site and inspected by field personnel. Equipment was also cleaned between uses and locations, and at the completion of activities.
- To clean smaller pieces of equipment such as water level and interface meters, the equipment was scrubbed using a brush and soapy water (tap water), as necessary to remove particulate matter, the equipment was rinsed with phosphate-free soap solution and then rinsed with tap water.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD
June 27, 2014

As a check on the laboratory analytical methods and on sample precision, the following QC samples were submitted:

- Three blind field duplicate soil samples for analysis of PHCs, metals, SAR, EC, VOCs, and PAHs;
- One blind field duplicate soil sample for analysis of pH and PCBs;
- Three blind field duplicate groundwater samples for analysis of PHC, metals, PAHs, and VOCs;
- One blind field duplicate groundwater sample for analysis of chloride, cyanide and pH;
- Two water field blanks for analysis of PHCs, and VOCs; and
- Two laboratory prepared water trip blanks for analysis of PHCs and VOCs.

The blind field duplicate samples were used to assess the precision of the sampling and analytical procedures. Typically, an RPD is calculated for the concentrations in the normal sample and its duplicate. The RPD was calculated using the following formula:

$$RPD = \left| \frac{C_1 - C_2}{(C_1 + C_2)/2} \right| \times 100$$

Where: C_1 is the concentration in the original sample; and

C_2 is the concentration in the sample duplicate.

Note that RPDs were only calculated in the event that the analytical result was greater than five times the RDL, in accordance with the *Maxxam Analytics Environmental QA/QC Interpretation Guide* (Maxxam, 2010). In addition, if the results for both the normal sample and the duplicate were below the RDL, the analytical results were assumed to have a high degree of similarity.

Maxxam considers RPDs of 100% or less to be acceptable for soil analyses. For the purposes of this assessment, a screening criterion of 100% was used for the assessment of soil analysis precision. Maxxam considers RPDs of 80% or less for most parameters and 50% or less for general chemistry parameters to be acceptable for groundwater analyses.

The results of RPD calculations for duplicate soil and groundwater samples are presented with the analytical data in Tables 3 to 6 in Appendix A.

In addition to the assessment of duplicate samples, Paracel conducted further internal QA/QC tests, which included replicate sample analyses, process blanks, process recovery and matrix

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

INVESTIGATION METHOD

June 27, 2014

spike analyses. The results of these tests are provided with the laboratory analytical reports in Appendix I.

No deviations from the QA/QC program set out in the sampling and analysis plan were noted.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

6.0 REVIEW AND EVALUATION

6.1 GEOLOGY

6.1.1 SURFICIAL GEOLOGY

As reported in the Phase One ESA (Stantec, 2013c) the native surficial soils in the Phase Two study area consisted of glaciomarine and marine deposits of fine textured silt, and clay with sand and gravel on Paleozoic terrain.

Well logs for previously installed wells identified native silt with fine sandy soils overlaying limestone bedrock within the Phase Two Property.

The stratigraphy observed during the Phase Two ESA is described on the test pit and borehole logs included in Appendix E and on cross sections provided in Figures 6 to 9 in Appendix B. A general description of the observed stratigraphy is provided below.

Two main overburden units were encountered in test pits and boreholes completed at the Phase Two Property, as follows:

- *Fill* – A layer of fill consisting of various soil types was observed across the Phase Two Property, extending to depths ranging from 2.0 mbgs to 6.1 mbgs. The fill layer material descriptions included: gravel, cobbles and boulders; dark brown sand with gravel and trace silty clay; gravel with medium, brown, sand; coarse sand and gravel; medium sand; silty sand; and brown silt with medium sand. Within the fill in numerous locations across the Phase Two Property debris was observed, including: coal pieces, glass fragments, wood debris, concrete debris, crushed rock, brick debris, ceramic plates and tile pieces, black debris, metal cables, electrical wires, metal debris, road base granular material, and an ash layer;
- *Brown to Grey Silty Clay* – A thin layer of native silty clay was observed in numerous borehole and test pit locations across the Phase Two Property. The silty clay was considered to be native material as it was a thin layer directly on top of the bedrock surface.

The drilling program in April 2014 identified the presence of a solution enhanced cavity in MW14-1. The Site overburden is underlain by limestone and shale of the Verluam Formation and potentially overlying limestone of the Bobcaygeon Formation. The Paleozoic carbonate rocks are susceptible to the formation of karst. Still photographs taken from a down hole video show the dissolution cavity present in MW14-1. The dissolution cavity is present at approximately 14 m bgs.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

In 2004, the Province of Ontario revised the Provincial Policy Planning Statement (PPS) to recognize the hazards associated with development in karst areas (areas subject to bedrock instability). Ontario Ministry of Natural Resources (OMNR, undated) suggests that no one formula exists for determining how hazardous a karst formation is, or may become and recommends a site specific assessment. A combined hydrogeological and geotechnical investigation is recommended to determine the karst dissolution rate, bedrock stability, and subsurface distribution of voids by applying appropriate geophysical techniques.

Soil impacts as a result of the identified APECs and potential COCs were expected to be throughout the fill layer due to reworking of the soil over the years. Surficial soil and samples from depth were collected to understand the extent of any potential impact in the soil.

6.1.2 BEDROCK GEOLOGY

Based on an available bedrock geology map (EMR, 1976) bedrock in the area of the Site consists of Paleozoic limestone with shale partings of the Bobcaygeon Formation. The depth to bedrock encountered during previous investigations ranged between 1.9 and 4.9 m below grade. According to the field observations during the Phase II ESA and Phase Two ESA, limestone bedrock was encountered from depths ranging from 2.0 mbgs to 6.1 mbgs.

6.2 GROUNDWATER: ELEVATIONS AND FLOW DIRECTION

All soil samples from the test pits locations were reported to be dry. Groundwater was identified in the fractured limestone bedrock in nine of the 10 monitoring wells present on the Phase Two Property during the April 24, 2014 event (the remaining well MW13-12 could not be located). The groundwater level ranged between 4.08 mbgs and 13.97 mbgs in the monitoring wells.

As indicated in Section 3.1 and Appendix D, the monitoring well locations were chosen based on APECs identified during the Phase One ESA. The screened intervals of monitoring wells were chosen to assess the presence or absence of COCs and were designed to intercept the water table, as estimated at the time of drilling.

As summarized in Section 5.8, the measurement of static ground water levels and the assessment of the presence of free-flowing product were completed at the Phase Two Property on April 22, 2013, for MW13-1 and MW13-2, on July 25 & 26, 2013, for MW13-10 to MW13-14, on April 10, 2014, for MW13-1, MW13-2, MW13-10, MW13-11, MW13-13, MW13-14, MW14-1 to MW14-3 and on April 24, 2014, for MW13-10, MW14-1 and MW14-3. As summarized in Section 5.12, the ground surface elevations of the monitoring wells were measured by a Stantec field technician with a +/- 0.04 m accuracy.

Depth to groundwater relative to the ground surface was calculated by subtracting the depth to groundwater from the top of pipe elevation measured at the monitoring well and adding the difference between the top of pipe elevation to the ground surface elevation. Static

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

groundwater levels ranged from 3.98 mbgs at MW13-14 to 7.33 mbgs at MW13-11 in July 2013. MW13-10, MW13-12, and MW13-13 were observed to be dry on July 25 & 26, 2013, to the completion depth of the borehole at 11.58, 10.67, and 7.62 mbgs, respectively. Groundwater levels ranged between 0.15 mbgs at MW13-13 and 13.87 m bgs at MW14-1 on April 10, 2014; and ranged between 4.08 mbgs at MW13-14 and 13.97 mbgs at MW14-1 on April 24, 2014. Groundwater elevations ranged from 50.82 m AMSL at MW13-11 to 53.13 m AMSL at MW13-14 in July 2013. The groundwater elevations ranged from 44.01 m AMSL in MW14-1 to 52.99m AMSL at MW13-14 on April 24, 2014.

During the April 10, 2014, sampling event, the water level measured in MW13-13 was 0.15 m bgs. This was considered to be surface water infiltration as the j-plug was loose when opened to sample.

The interpreted ground water flow directions from July 2013 and April 24, 2014, are presented on Figures 5a and 5b in Appendix B, and were interpreted to be in a west-northwest direction based on the July 2013 groundwater elevations, and interpreted to be in a northwest direction based on the April 2014 groundwater elevations. The interpreted groundwater flow at the Site is likely influenced by the solution cavity, identified in MW14-1, and the sewer lines in the easement running north-south across the centre of the Site. The anticipated groundwater flow direction is to the north, based on the confluence of the Ottawa and Rideau Rivers to the north of the Site.

Groundwater elevations and well headspace vapour concentrations are presented on Table 2 in Appendix A. Monitoring well headspace combustible gas concentrations were measured as summarized in Section 5.4 at each monitoring well head immediately upon the removal of the j-plug using the RKI eagle. Headspace vapour concentrations ranged from <5 ppmv in MW13-11 to 2% LEL in MW13-13 both measured on July 26, 2013. The headspace vapour concentrations ranged from less than 5 ppmv in multiple locations to 60 ppmv in MW14-2 on April 10, 2014; and the headspace vapour concentrations ranged from < 5 ppmv in multiple locations to 15 ppmv at MW13-13 on April 24, 2014.

A separate layer of free-flowing product was not detected on top of the water column at any of the monitoring well locations. Additionally, no sheen or odour was observed on the groundwater at any of the monitoring wells during development.

Temporal variability could not be established in the Phase Two ESA, as the monitoring wells have only been monitored in the spring/summer, although some seasonal fluctuation in groundwater elevations would be expected.

The interaction of groundwater with buried utilities in or under the Phase Two Property is likely, as buried utilities, storm and sanitary sewers that run north-south through the centre of the Phase Two Property, a storm sewer that runs east-west across the centre of the Phase Two Property, and abandoned wires traced at the northwest corner of the Phase Two Property, are present beneath the Phase Two Property.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

6.3 GROUND WATER: HYDRAULIC GRADIENTS

Representative horizontal hydraulic gradients at the Phase Two Property were calculated to be 0.10 in a northwest direction (using well pair MW13-13 and MW13-10), based on groundwater levels measured on April 24, 2014. Multi-level monitoring wells were not installed at the Phase Two Property, as such; vertical hydraulic gradients were not calculated for the Phase Two Property.

6.4 FINE-MEDIUM SOIL TEXTURE

Fine-medium soil texture has not been considered in the selection of the appropriate site condition standards.

As summarized in Section 2.4, grain size analyses from previous investigations at the west end of the Phase Two Property identified the soil texture as coarse grained. (Stantec, 2013b). The current investigation included two grain size analyses that identified fine-medium grained soils in one sample and coarse grained soils in the other. However, based on the heterogeneity of fill material, a conservative approach was undertaken and the soil texture was deemed coarse grained at the Phase Two Property, and that the soil at the Phase Two Property should be classified as coarse textured, based on Section 42(1) of O.Reg.153/04.

6.5 SOIL: FIELD SCREENING

As summarized in Section 5.4, soil field screening for potential impacts was completed using visual and olfactory observation and by measuring headspace CGC using an RKI Eagle.

Soil sampling locations are indicated on Figure 2 in Appendix B. Headspace CGC for soil samples ranged from less than 5 ppm_v at various borehole and test pit locations to 165 ppm_v at TP10. The measured headspace CGC readings are presented on the test pit and borehole logs in Appendix E.

Black staining and creosote odours were identified in MW13-3, TP4, TP15, TP19, and TP21, all at depths between 1 mbgs and 3 mbgs, with the exception of MW13-3 where the creosote odour was identified between 4.3 and 4.7 mbgs. Black staining and coal fragments were noted in BH14-4 between 1.8 mbgs and 2.6 mbg; and black staining was noted in MW14-2 between 3 mbgs and 3.8 mbgs. No other visual or olfactory evidence of PHC impacts was noted.

6.6 SOIL QUALITY

A summary of soil analytical results for the current Phase Two ESA compared with the applicable SCS, including the locations and depths of samples and maximum known concentrations, is presented in Tables 3 to 5, and Table 7 in Appendix A. Laboratory Certificates of Analysis are provided in Appendix I.



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

Based on the soil analytical data, as summarized in Tables 3 to 5 and Table 7, the following soil samples had concentrations of one or more parameters that exceeded the Table 3 SCS:

- TP2, TP3, TP4, TP16, TP18, TP28, BH14-4*, BH14-5*: PAHs;
- TP29: metals
- TP5, TP7, TP9, TP10, TP11, TP13, TP15, TP17, TP20, TP21, TP24, TP25, TP30: metals, PAHs;
- TP8: metals, PAHs, EC;
- TP12, TP19, TP27: PHC, metals, PAHs
- MW13-1: SAR, metals and PAHs;
- BH13-8: EC, SAR, metals and PAHs;
- MW13-11: EC, PAHs;
- BH13-9, TP23: EC, SAR; and
- TP26: PHC.

Note:

* - samples were submitted for analysis of PAHs only. Concentrations of other parameters were not analyzed.

Soil sampling locations that exceed the Table 3 SCS are illustrated on Figures 3, 6, and 7 in Appendix B.

6.6.1 SUMMARY OF SOIL QUALITY AND IDENTIFICATION OF COCS

The maximum concentrations of chemicals in soil were compared with the Table 3 SCS to identify COCs. The maximum concentrations of the chemicals in soil are shown in Table 9 in Appendix B. If a substance was less than the laboratory detection limit in all of the samples analyzed for that substance, it was assumed to be absent from the Phase Two Property. A chemical parameter was considered a COC if it was detected at a concentration greater than the Table 3 SCS. As discussed, select soil samples analyzed exceeded the applicable Table 3 SCS; therefore, COCs were identified with respect to soil quality at the Phase Two Property.

Soil COCs that were identified based on the Table 3 SCS were the following:

- PHC F1 to F3;
- Electrical Conductivity;
- Sodium Absorption Ratio;



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

- Antimony;
- Arsenic;
- Barium;
- Copper;
- Lead;
- Mercury;
- Molybdenum;
- Thallium;
- Zinc;
- Acenaphthylene;
- Anthracene;
- Benzo(a)anthracene;
- Benzo(a)pyrene;
- Benzo(b)fluoranthene;
- Benzo(g,h,i)perylene;
- Benzo(k)fluoranthene;
- Biphenyl, 1,1'-(Biphenyl);
- Chrysene;
- Dibenzo(a,h)anthracene;
- Fluoranthene;
- Indeno(1,2,3-cd)pyrene
- Methylnaphthalene (Total)
- Naphthalene;
- Phenanthrene; and
- Pyrene.

VOCs were reported at less than the laboratory RDL, or if a concentration was detected, the concentration was less than the Table 3 SCS. Therefore, VOCs are not a COC at the Phase Two Property.

The current understanding of the distribution of COCs in soil across the Phase Two Property is illustrated in plan view on Figure 3, Appendix B, and in cross section on Figures 6 and 7.



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

The presence of metals and PAHs in the soil is a source of contaminant mass that could contribute to groundwater impacts; however, the groundwater is present within the fractured limestone bedrock; therefore, the presence of contaminants in the soil are unlikely to have contributed to groundwater impacts. Soil was collected from BH14-4, BH14-5, and BH14-6 in April 2014 and submitted for laboratory analysis of bulk PAHs and leachate PAH analyses to be used in a future risk assessment.

The concentrations of PHCs that exceed the Table 3 SCS in soils are not indicative of the presence of free phase product, as determined by a comparison with the Free Phase Threshold presented by the MOE (MOE, 2011c).

6.7 GROUNDWATER QUALITY

Groundwater samples were collected from four monitoring wells MW13-1, MW13-2 on April 22, 2013, and MW13-11, MW13-14, on July 31, 2013. MW13-1 and MW13-2 could not be resampled on July 31, 2013, due to land access issues. The remaining monitoring wells present on the Phase Two Property were observed to be dry at the time of sampling or had insufficient groundwater volumes to complete the sampling. Groundwater samples were collected from nine monitoring wells, MW13-1, MW13-2, MW13-10, MW13-11, MW13-13, MW13-14, MW14-1, MW14-2, and MW14-3, on April 10 and 11, 2014. MW13-12 could not be located on April 10, 2014, and is presumed to be destroyed. Groundwater samples were collected from three monitoring wells (MW13-10, MW14-1, MW14-3) on April 24, 2014, in duplicate. Limited water was present in MW13-10 on tow occasions in April 2014, and MW13-13 was analyzed on April 24, 2014, for metals and PAHs only due to limited water volume (was purged dry on April 10 and did not recover). The locations of the monitoring wells are illustrated on Figure 2 in Appendix B and the screened intervals are presented on Table 1 in Appendix A. As indicated in Section 5.8, groundwater samples collected for metals analysis were filtered in the field prior to preservation using dedicated, disposable 0.45 µm in-line filters.

The groundwater analytical results compared with the applicable Table 3 SCS, are presented in Table 6, Appendix B. It is noted that the Table 3 SCS for groundwater are the same for all land uses. Based on review of the analytical results, no parameters had concentrations greater than the Table 3 SCS with the exception of MW13-10 for Benzo [g,h,i] perylene; MW14-1 for PHC F3, PHC F4, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene and indeno[1,2,3-cd]pyrene; and MW14-3 for sodium, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene. The concentrations of PAHs and PHC fractions in groundwater found in MW14-1 were in question as a note from the lab indicated that there was significant sediment in the sample and this is expected to result in reduced accuracy of the reported results. PAHs and PHC F3 and F4 are known to bind to sediment particles which could present concentrations greater than the true dissolved concentration found in the groundwater. Therefore an additional round of groundwater sampling was conducted on April 24, 2014, in which the samples from MW13-10,

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

MW14-1, and MW14-3 would have two sets of bottles for PAHs, one sample would be filtered at the laboratory and the second would be unfiltered to demonstrate the effect of sediment in the sample. The results from the filtered and non-filtered pairings indicate that the samples from April 10, 2014, contained false exceedences for PAHs due to the sediment levels. However, groundwater samples collected from MW14-1 and MW14-3 still exceed the Table 3 SCS for PHC F3 and F4, and sodium, respectively, as filtering prior to analysis is not permitted for these parameters (MOE, 2011d). Laboratory Certificates of Analysis are presented in Appendix C.

The maximum concentrations of parameters detected in groundwater are presented in Table 10 in Appendix B.

6.8 SEDIMENT QUALITY

As indicated in Section 4.2, sediment was not present within the investigated portion of the Phase Two Property, and sediment sampling was not required as per the sampling and analysis plan for the Phase Two ESA provided in Appendix D.

6.9 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

The DQO for the investigation was to collect data that were precise, accurate, reproducible, complete, and suitable for comparison with the Table 3 SCS. RPD screening levels of 50% to 100% were used to assess the precision of the soil and groundwater sample analyses (Maxxam, 2010).

All soil and groundwater samples were handled in accordance with the required analytical protocols, including holding time, preservation method, storage requirements and container type. In addition, a laboratory Certificate of Analysis was received for each soil and groundwater sample submitted for analysis, and all laboratory Certificates of Analysis and analytical reports complied with the requirements under Subsection 47 (3) of O.Reg.153/04. Copies of the laboratory Certificates of Analysis in their entirety are included in Appendix I.

As discussed in Section 5.13, as a check on the laboratory analytical methods and on sample precision, the following QC samples were submitted:

- Three blind field duplicate soil samples for analysis of PHCs, metals, SAR, EC, VOCs, and PAHs;
- One blind field duplicate soil sample for analysis of pH and PCBs;
- Three blind field duplicate groundwater samples for analysis of PHC, metals, PAHs, and VOCs;
- One blind field duplicate groundwater sample for analysis of chloride, cyanide and pH;
- Two water field blanks; and

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

- Two laboratory prepared trip blanks for groundwater.

As shown on Tables 4 and 5 in Appendix B, the calculated RPDs for the field duplicate soil samples and their corresponding regular investigative samples were less than the respective screening criteria of 100%, with the exception of the following:

- The original sample TP19-3 and its duplicate sample TP190-3 (1 – 1.5 mbgs) had RPDs greater than 100% for the following parameters: PHC F2, zinc, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, phenanthrene, pyrene as reported in Table 4. The elevated RPDs were attributed to soil sample heterogeneity. For the majority of the parameters the concentrations in the original were either greater than or less than the Table 3 SCS; therefore, the decreased precision was not considered to affect the interpretation of data quality.

As shown on Table 6 in Appendix B, the calculated RPDs for the field duplicate groundwater samples, one from each sampling event, and their corresponding regular investigative samples were less than the respective screening criteria of 50% (general chemistry) or 80% (all other parameters).

In addition to the assessment of field duplicate samples submitted by Stantec, Paracel followed internal QA/QC protocols, which included method blank, matrix spike, spiked blank, QC standard, and laboratory duplicate analyses. Paracel reported that the results for their internal QA/QC were within acceptable limits.

Based on the above assessment, it is Stantec's opinion that the results of the QA/QC procedures indicate that the DQO for the soil and groundwater data were generally met, that the overall objectives of the investigation and assessment were met, and that the soil and groundwater data were of acceptable quality.

6.10 PHASE TWO CONCEPTUAL SITE MODEL

6.10.1 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

The Phase One ESA indicated a number of potentially contaminating activities (PCAs) that have potentially impacted soil and groundwater at the Phase Two Property. The Phase One ESA identified five APECs, as listed in Section 2.2, which were assessed in the Phase Two ESA investigation. A description and assessment of what is known about each of the APECs follows, in light of the results of the Phase Two ESA.

- **APEC # 1** – The presence of fill of unknown quality covering the entire Phase Two Property from the late 1960s. Activities such as leveling of residences, former roadway, and a soil

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

berm of unknown quality on the property had attributed to this APEC. PAH, Metal, and PHC impacts to soil may be attributed to these historical activities at the Phase Two Property;

- **APEC # 2** – Historical presence of coal storage yard on the Phase Two Property from the 1950s. The presence of PAH impacts to soil at the northeast corner of the Phase Two Property may be attributable to the historical presence of the coal storage yard;
- **APEC # 3** – Historical presence of railway tracks running east west to the north of the Phase Two Property. Creosote railway ties, coal transportation, and metals shavings from the operations could have impacted the soil of the Phase Two Property. Contaminants of concern relating to this historical activity include PAHs, PHC and metals.
- **APEC # 4** – Historical presence of an automotive repair garage and gasoline storage tank to the west of the Phase Two Property. The automotive garage and gasoline UST were present in the 1956 fire insurance plan. Due to repair activities and the storage of gasoline, PAHs, PHC, metals and VOCs could have impacted the Phase Two Property; and
- **APEC # 5** – Presence of a commercial autobody shop to the southeast of the Phase Two Property. Although off-site, this autobody shop has been in operation since the 1970s. Impacts of PAHs, PHCs, metals and VOCs could be due to this activity.

6.10.1.1 UNDERGROUND UTILITIES AND SUBSURFACE STRUCTURES

The role that underground utilities and subsurface structures may play in providing conduits for contaminant migration was assessed in the Phase Two ESA. As summarized in Section 5.2, the interaction of groundwater with buried utilities on, in or under the Phase Two Property is likely, as buried utilities are present through the centre and along the west side of the Phase Two Property.

6.10.2 PHYSICAL SETTING

The Phase One ESA estimated physical characteristics and pathways at the Phase Two Property based on a review of available information. Following the completion of the Phase Two ESA, a more accurate understanding of the physical characteristics and contaminant pathways was developed, with respect to the subsurface environment and groundwater flow.

The stratigraphic and hydrogeological characteristics of the Phase Two Property are presented on borehole logs provided in Appendix E, on cross sections in Figures 6 to 9, and on the groundwater contour map provided in Figure 5. The following presents a summary of the major findings.

Two stratigraphic units were identified underlying the Phase Two Property, as follows:



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

- *Fill* – A layer of fill consisting of various soil types was observed across the Phase Two Property, extending to depths ranging from 2.0 mbgs to 6.1 mbgs. The fill layer material descriptions included: gravel, cobbles and boulders; dark brown sand with gravel and trace silty clay; gravel with medium, brown, sand; coarse sand and gravel; medium sand; silty sand; and brown silt with medium sand. Within the fill in numerous locations across the Phase Two Property debris was observed, including: coal pieces, glass fragments, wood debris, concrete debris, crushed rock, brick debris, ceramic plates and tile pieces, black debris, metal cables, electrical wires, metal debris, road base granular material, and an ash layer;
- *Brown to Grey Silty Clay* – A thin layer of native silty clay was observed in numerous borehole and test pit locations across the Phase Two Property. The silty clay was considered to be native material as it was a thin layer directly on top of the bedrock surface.

Bedrock was encountered at depths ranging from 2.0 to 6.1 mbgs during the Phase Two ESA.

Groundwater elevations ranged from 50.82 m AMSL at MW13-11 to 53.13 m AMSL at MW13-14 in July 2013, and ranged from 44.01 m AMSL in MW14-1 to 52.99 m AMSL at MW13-14 on April 24, 2014. Static groundwater levels ranged from 3.98 mbgs at MW13-14 to 7.33 mbgs at MW13-11 in July 2013. Groundwater levels ranged between 0.15 mbgs at MW13-13 (due to surface water infiltration) and 13.87 mbgs at MW14-1 on April 10, 2014; and ranged between 4.08 mbgs at MW13-14 and 13.97 mbgs at MW14-1 on April 24, 2014. Groundwater flow was interpreted to be in a northwest direction across the Phase Two Property in April 2014. The measured groundwater elevation contours are illustrated on Figures 5a and 5b in Appendix B. The groundwater flow direction is likely affected by the solution cavity in MW14-1 and sewer alignments running north-south across the centre of the Phase Two Property.

6.10.3 IDENTIFICATION AND DISTRIBUTION OF COCS

6.10.3.1 SOIL

The lateral and vertical distribution of COCs assessed in soil in the Phase Two ESA is considered to be all the soil on the Phase Two Property (from property line to property line) and from ground surface to bedrock. The soil COCs identified in the Phase Two ESA are listed in Section 6.6.1 above, and comprised metals, PAHs, PHCs, and inorganic parameters.

6.10.3.2 GROUNDWATER

A review of the groundwater analytical data indicated that the parameters analyzed were less than the Table 3 SCS, with the exception of PHC F3 and F4 in MW14-1 and sodium in MW14-3. As previously discussed, high amounts of sediment were present in groundwater samples submitted for analysis of PAHs. Laboratory filtered samples indicated very low detectable concentrations

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

REVIEW AND EVALUATION
June 27, 2014

of dissolved PAHs that did not exceed the Table 3 SCS. Therefore, the groundwater COCs are PHC F3, PHC F4, and sodium.

6.10.4 RISK ASSESSMENT

Should a risk assessment be completed, a diagram identifying the release mechanisms, contaminant transport pathways, the human and ecological receptors located on, in or under the Phase Two Property, the reception exposure points, and routes of exposure for each area where a COC is present on, in or under the property at a concentration greater than the applicable SCS will be created.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CONCLUSIONS
June 27, 2014

7.0 CONCLUSIONS

Stantec offers the following conclusions with respect to the results of the Phase Two ESA:

- The land use, soil type and other characteristics were considered to select the 2011 Table 3 SCS for residential land use, in a non-potable groundwater situation, with coarse textured soil as the appropriate standards for the assessment of Phase Two Property soil and ground water quality.
- Groundwater measurements recorded at the Phase Two Property ranged from 4.08 mbgs at MW13-14 and 13.97 mbgs at MW14-1 on April 24, 2014. Groundwater flow direction appeared to be in generally a northwesterly direction;
- Boreholes and test pits advanced during the Phase Two ESA indicated that the overburden consisted generally of heterogeneous fill, underlain in a few locations by a silty clay on the bedrock surface. The bedrock surface was encountered between 2.0 m bgs and 6.1 m bgs;
- Selected soil samples were submitted for laboratory analysis and results indicated that there were exceedances of the residential Table 3 SCS for the following parameters:
 - TP2, TP3, TP4, TP16, TP18, TP28, BH14-4*, BH14-5*: PAHs;
 - TP29: metals
 - TP5, TP7, TP9, TP10, TP11, TP13, TP15, TP17, TP20, TP21, TP24, TP25, TP30: metals, PAHs;
 - TP8: metals, PAHs, EC;
 - TP12, TP19, TP27: PHC, metals, PAHs;
 - MW13-1: SAR, metals and PAHs;
 - BH13-8: EC, SAR, metals and PAHs;
 - MW13-11: EC, PAHs;
 - BH13-9, TP23: EC, SAR; and
 - TP26: PHC.

Note:* - samples were submitted for analysis of PAHs only. Concentrations of other parameters were not analyzed.

- Groundwater samples were submitted for laboratory analysis and results indicated the following exceedances of the Table 3 SCS:
 - PHC F3



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CONCLUSIONS
June 27, 2014

- PHC F4
- Sodium;
- Based on the presence of a dissolution cavity in one monitoring well (MW14-1), it is recommended to conduct a combined hydrogeological and geotechnical investigation to determine the karst dissolution rate, bedrock stability, and subsurface distribution of voids by applying appropriate geophysical techniques
- The results of the Phase Two ESA confirmed the presence of COCs at the Phase Two Property, and upon review of the APECs identified in the Phase One ESA, concluded that the impacts were most likely derived from on-site activities associated with the fill of unknown quality;
- The lateral and vertical extents of the identified soil impacts have been delineated to consist of all the soil from surface to bedrock, across the entire Phase Two Property;
- The lateral extent of the identified groundwater impacts have been delineated to the middle portion of the western half of the Phase Two Property;
- Soil and groundwater quality at the Phase Two Property does not meet the applicable Table 3 SCS, and property-specific standards have not been developed; therefore, additional work (i.e., risk assessment) is required to satisfy the requirements of a RSC.

7.1 SIGNATURES

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.



FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

CONCLUSIONS
June 27, 2014

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

- Sampling locations as shown on Figure 2. Conditions may vary between sampling locations.
- The analytical parameters listed in Appendix D.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Brenda Thom, M.Sc.(Eng.), and reviewed by Jane Yaraskavitch, M.Eng., P.Eng.

As QP_{ESA}, I (Jane Yaraskavitch) confirm that I have supervised the carrying out of this Phase Two ESA and concur with the findings and conclusions of this report. In addition, I confirm that I have



**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

CONCLUSIONS
June 27, 2014

completed a technical review of the Phase Two ESA and also concur with the findings and conclusions of this report.

All of which is respectfully submitted,

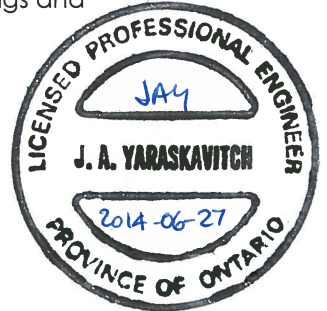
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The objectives and requirements set out in Ontario Regulation 153/04 for a Phase Two Environmental Site Assessment were applied in carrying out the environmental site assessment and preparing this report, with the exception of the current legal survey signed and sealed by an Ontario Land Surveyor which has not been included. This legal survey will be included in the report when it is available.

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

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June 27, 2014

8.0 BIBLIOGRAPHY

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FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

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**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix A
TABLES
June 27, 2014

Appendix A

TABLES

Table 1
Summary of Monitoring Well Installation Details
Phase Two Environmental Site Assessment
Boteler Berm
City of Ottawa

Sample Location	Coordinates		Elevation***		Stick-up (m BGS)	Borehole			Well Diameter (mm)	Well Screen				Sand Pack				
	Easting	Northing	TOC (m AMSL)	GS (m AMSL)		Depth (m BGS)	Depth (m AMSL)	Diameter (mm)		Top		Bottom		Screen Slot Size	Top		Bottom	
										(m BGS)	(m AMSL)	(m BGS)	(m AMSL)		(m BGS)	(m AMSL)	(m BGS)	(m AMSL)
MW13-1	445690.979	5031575.776	56.420	56.530	0.11	6.40	50.13	38	31	3.69	52.840	6.4	50.130	10	3.66	52.870	6.4	50.130
MW13-2	445664.973	5031561.794	56.877	56.953	0.08	6.40	50.55	38	31	3.96	52.993	6.4	50.553	10	3.66	53.293	6.4	50.553
MW13-3**	445643.253	5031590.955	61.175	60.220	-0.95	12.80	47.42	38	31	9.75	50.470	12.8	47.420	10	9.45	50.770	12.8	47.420
MW13-7**	445657.852	5031569.819	56.958	57.067	0.11	9.75	47.32	38	31	6.7	50.367	9.75	47.317	10	6.4	50.667	9.75	47.317
MW13-10	445668.371	5031609.625	58.266	58.279	0.01	11.58	46.70	38	31	8.53	49.749	11.58	46.699	10	8.22	50.059	11.58	46.699
MW13-11	445705.630	5031628.799	58.054	58.224	0.17	10.67	47.55	38	31	7.62	50.604	10.67	47.554	10	7.32	50.904	10.67	47.554
MW13-12**	445745.095	5031646.311	NM	57.877	NM	10.67	47.21	38	31	7.62	50.257	10.67	47.207	10	7.32	50.557	10.67	47.207
MW13-13	445723.194	5031598.254	57.205	57.244	0.04	7.62	49.62	38	31	4.57	52.674	7.62	49.624	10	4.27	52.974	7.62	49.624
MW13-14	445793.828	5031638.064	56.918	57.069	0.15	7.62	49.45	38	31	4.57	52.499	7.62	49.449	10	4.27	52.799	7.62	49.449
MW14-1	445662.636	5031595.575	57.934	57.988	0.05	14.50	43.49	38	31	7.62*	50.368	14.5*	43.488	n/a	n/a	n/a	n/a	n/a
MW14-2	445725.317	5031630.086	57.901	58.010	0.11	15.70	42.31	38	31	12.65	45.360	15.7	42.310	10	11.58	46.430	15.7	42.310
MW14-3	445700.467	5031603.986	57.802	57.906	0.10	13.00	44.91	38	31	9.98	47.926	13	44.906	10	9.14	48.766	13	44.906

Notes:

- * no screen installed, open hole depth
- ** surveyed in April 2013, decommissioned in June 2013
- *** all available wells were resurveyed on April 24, 2014
- TOC top of casing
- GS ground surface
- m AMSL metres above mean sea level
- m BGS metres below ground surface
- NM not measured
- n/a not applicable since no screen installed

Table 2
Summary of Water Elevations
Phase Two Environmental Site Assessment
Boteler Berm
City of Ottawa

Sample Location	Monitoring Date	Ground Surface Elevation (m AMSL)	Top of Pipe Elevation (m AMSL)	Water Level Elevation (m AMSL)	Water Level Depth (m bTOP)	Water Level Depth (mBGS)	Well Headspace Vapour Concentration	LNAPL Thickness (mm)	
MW13-1	4/22/2013 **			51.12	5.30	5.41	25 ppm	0	
	4/10/2014	56.530	56.420	51.15	5.27	5.38	<5 ppm	0	
	4/24/2014			51.12	5.30	5.41	<5 ppm	0	
MW13-2	4/22/2013 **			52.33	4.63	4.72	35 ppm	0	
	4/10/2014	56.953	56.877	52.37	4.51	4.59	<5 ppm	0	
	4/24/2014			52.21	4.67	4.75	<5 ppm	0	
MW13-3*	4/22/2013	60.22***	61.175	NA	Dry	Dry	35 ppm	0	
MW13-7*	4/22/2013	57.07***	56.958	NA	Dry	Dry	90 ppm	0	
MW13-10	7/25/2013			NA	Dry	Dry	6 ppm	0	
	4/10/2014	58.279	58.266	48.77	9.50	9.51	20 ppm	0	
	4/24/2014			46.94	11.33	11.34	<5 ppm	0	
MW13-11	7/26/2013			50.82	7.12	7.33	<5 ppm	0	
	4/10/2014	58.224	58.054	51.07	6.98	7.15	<5 ppm	0	
	4/24/2014			50.95	7.10	7.27	<5 ppm	0	
MW13-12	7/26/2013			NA	Dry	Dry	65 ppm	0	
	4/10/2014	57.877***	NM	could not locate, presumed destroyed					
	4/24/2014			could not locate, presumed destroyed					
MW13-13	7/26/2013			NA	Dry	Dry	2 % LEL	0	
	4/10/2014	57.244	57.205	57.10	0.11	0.15	5 ppm	0	
	4/24/2014			52.44	4.77	4.81	15 ppm	0	
MW13-14	7/26/2013			53.09	3.84	3.98	90 ppm	0	
	4/10/2014	57.069	56.918	53.29	3.63	3.78	20 ppm	0	
	4/24/2014			52.99	3.93	4.08	<5 ppm	0	
MW14-1	4/10/2014			44.11	13.82	13.87	<5 ppm	0	
	4/24/2014	57.988	57.934	44.01	13.92	13.97	10 ppm	0	
MW14-2	4/10/2014			49.34	8.56	8.67	60 ppm	0	
	4/24/2014	58.010	57.901	49.39	8.51	8.62	10 ppm	0	
MW14-3	4/10/2014			48.38	9.42	9.52	10 ppm	0	
	4/24/2014	57.906	57.802	48.34	9.46	9.56	<5 ppm	0	

- Notes:**
- ppm parts per million by volume
 - % LEL percentage of lower explosive limit
 - m AMSL metres above mean sea level
 - m bTOP metres below top of pipe
 - m BGS metres below ground surface
 - NM not measured due to heavy equipment placed over top of well
 - NA not available
 - LNAPL Light non-aqueous phase liquid
 - * Monitoring wells MW13-3 and MW13-7 were decommissioned on June 13, 2013.
 - ** No access to MW13-1 and MW13-2 in July 2013
 - *** Surveyed in April 2013.

Table 3
Testpit Surficial Soil Analytical Results
Boteler Berm
City of Ottawa

Sample Location			TP23	TP24	TP25	TP26	TP27	TP28	TP29	TP30
Sample Date			24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID			TP23-1	TP24-1	TP25-1	TP26-1	TP27-1	TP28-1	TP29-1	TP30-1
Sample Depth			0 - 0.5 m	0 - 0.5 m	0 - 0.5 m	0 - 0.5 m	0 - 0.5 m	0 - 0.5 m	0 - 0.5 m	0 - 0.5 m
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL
Laboratory Work Order		Amended	1330254	1330254	1330254	1330254	1330254	1330254	1330254	1330254
Laboratory Sample ID	Units	O.Reg 153/04	1330254-10	1330254-17	1330254-13	1330254-12	1330254-15	1330254-16	1330254-14	1330254-11
General Chemistry										
Percent Solids	%wt	n/v	94.0	89.4	84.8	95.3	83.8	88.4	91.8	87.7
pH	S.U.	5-9 ₁₂ ^B	-	-	7.44	-	-	-	-	7.80
Petroleum Hydrocarbons										
PHC F1 (C6-C10 range)	µg/g	25 ₁₇ ^A 55 ₁₇ ^B	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7
PHC F2 (>C10-C16 range)	µg/g	10 ₁₅ ^A 98 ₁₅ ^B	< 4	< 4	< 4	17 ^A	< 4	< 4	< 4	< 4
PHC F3 (>C16-C34 range)	µg/g	240 ₁₈ ^A 300 ₁₈ ^B	< 8	38	38	1270 ^{AB}	466 ^{AB}	< 8	66	20
PHC F4 (>C34-C50 range)	µg/g	120 ₁₀ ^A 2800 ₁₀ ^B	< 6	10	12	140 ^A	63	< 6	122 ^A	21
Metals										
Antimony	µg/g	1.3 ^A 7.5 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	µg/g	18 ^{AB}	2.6	2.8	1.3	1.1	3.8	1.9	2.4	< 1.0
Barium	µg/g	220 ^A 390 ^B	104	181	103	142	220	78.9	117	119
Beryllium	µg/g	2.5 ^A 4 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Boron	µg/g	36 ^A 120 ₁₆ ^B	5.5	3.6	1.7	3.3	4.9	2.5	3.4	2.6
Boron (Available)	µg/g	n/a ^A 1.5 ₁₆ ^B	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	µg/g	1.2 ^A 1.2 ^B	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (Hexavalent)	µg/g	0.66 ^A 8 ^B	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Total)	µg/g	70 ^A 160 ^B	5.9	15.0	14.3	4.1	13.5	10.6	7.5	12.8
Cobalt	µg/g	21 ^A 22 ^B	2.7	4.9	3.7	1.9	3.8	3.6	2.9	4.4
Copper	µg/g	92 ^A 140 ^B	5.0	28.6	6.6	4.3	21.3	12.3	9.6	9.2
Lead	µg/g	120 ^{AB}	13.0	187 ^{AB}	10.3	8.3	354 ^{AB}	13.4	24.7	6.6
Mercury	µg/g	0.27 ^A 0.27 ^B	< 0.1	0.6 ^{AB}	< 0.1	< 0.1	0.6 ^{AB}	< 0.1	0.6 ^{AB}	< 0.1
Molybdenum	µg/g	2 ^A 6.9 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Nickel	µg/g	82 ^A 100 ^B	5.9	8.9	7.3	4.0	8.0	6.6	6.6	7.3
Selenium	µg/g	1.5 ^A 2.4 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Silver	µg/g	0.5 ^A 20 ^B	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Thallium	µg/g	1 ^{AB}	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Uranium	µg/g	2.5 ^A 23 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	µg/g	86 ^{AB}	6.5	23.2	21.1	5.5	18.1	18.1	11.5	21.5
Zinc	µg/g	290 ^A 340 ^B	12.8	109	26.5	7.5	165	23.3	23.0	20.3
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	µg/g	0.072 ^A 7.9 ^B	< 0.02	0.03	< 0.02	< 0.02	0.99 ^A	< 0.02	< 0.02	< 0.02
Acenaphthylene	µg/g	0.093 ^A 0.15 ^B	< 0.02	0.51 ^{AB}	0.02	< 0.02	1.98 ^{AB}	0.05	0.02	0.41 ^{AB}
Anthracene	µg/g	0.16 ^A 0.67 ^B	< 0.02	0.46 ^A	0.03	< 0.02	4.46 ^{AB}	0.07	0.03	0.48 ^A
Benzo(a)anthracene	µg/g	0.36 ^A 0.5 ^B	0.03	0.81 ^{AB}	0.07	0.04	9.04 ^{AB}	0.16	0.07	0.77 ^{AB}
Benzo(a)pyrene	µg/g	0.3 ^A 0.3 ^B	0.02	0.84 ^{AB}	0.06	0.03	6.85 ^{AB}	0.15	0.06	0.70 ^{AB}
Benzo(b)fluoranthene	µg/g	0.47 ^A 0.78 ^B	0.03	0.75 ^A	0.07	0.05	10.1 ^{AB}	0.15	0.10	1.15 ^{AB}
Benzo(g,h,i)perylene	µg/g	0.68 ^A 6.6 ^B	< 0.02	0.48	0.03	< 0.02	3.89 ^A	0.10	0.04	0.20
Benzo(k)fluoranthene	µg/g	0.48 ^A 0.78 ^B	< 0.02	0.28	0.03	< 0.02	3.57 ^{AB}	0.05	0.03	0.38
Chrysene	µg/g	2.8 ^A 7 ^B	0.03	0.88	0.07	0.04	8.88 ^{AB}	0.16	0.11	0.66
Dibenzo(a,h)anthracene	µg/g	0.1 ^A 0.1 ^B	< 0.02	0.14 ^{AB}	< 0.02	< 0.02	1.07 ^{AB}	< 0.02	< 0.02	0.05
Fluoranthene	µg/g	0.56 ^A 0.69 ^B	0.04	1.65 ^{AB}	0.12	0.06	17.2 ^{AB}	0.26	0.08	1.34 ^{AB}
Fluorene	µg/g	0.12 ^A 6.2 ^B	< 0.02	0.08	< 0.02	< 0.02	1.92 ^A	0.03	< 0.02	0.08
Indeno(1,2,3-cd)pyrene	µg/g	0.23 ^A 0.38 ^B	< 0.02	0.48 ^{AB}	0.03	< 0.02	3.42 ^{AB}	0.10	0.03	0.19
Methylnaphthalene (Total)	µg/g	0.59 ₂₃ ^A 0.99 ₂₃ ^B	< 0.04	< 0.04	< 0.04	< 0.04	< 0.80 GT	0.06	< 0.04	< 0.04
Methylnaphthalene, 1-	µg/g	₂₃ ^A ₂₃ ^B	< 0.02	< 0.02	< 0.02	< 0.02	< 0.40 GT	0.02	< 0.02	< 0.02
Methylnaphthalene, 2-	µg/g	₂₃ ^A ₂₃ ^B	< 0.02	< 0.02	< 0.02	< 0.02	0.41	0.04	< 0.02	< 0.02
Naphthalene	µg/g	0.09 ^A 0.6 ^B	< 0.01	0.03	< 0.01	< 0.01	0.97 ^{AB}	0.01	< 0.01	0.02
Phenanthrene	µg/g	0.69 ^A 6.2 ^B	0.03	0.84 ^A	0.05	0.04	14.1 ^{AB}	0.17	0.06	0.71 ^A
Pyrene	µg/g	1 ^A 78 ^B	0.04	1.39 ^A	0.11	0.05	14.5 ^A	0.24	0.07	1.12 ^A

See notes on last page.

Table 5
Borehole/Monitoring Well Soil Analytical Results
Boteler Berm
City of Ottawa

Notes:

Amended O.Reg 153/04	Province of Ontario "Soil, Ground Water and Sediment Standards for use under Part XV.I of the Environmental Protection Act" Amended (April 15, 2011) Site Condition Standards
A	MOE Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use
B	MOE Table 3 - Residential / Parkland / Institutional Property Use - Coarse Textured Soils
6.5^A	Concentration exceeds the indicated standard.
15.2	Concentration was detected but did not exceed applicable standards.
< 0.50	Laboratory estimated quantitation limit exceeded standard.
< 0.03	The analyte was not detected above the laboratory estimated quantitation limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
n/a	Not applicable.
AB	The criterion is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s1	
AB	If baseline is not reached during F4 analysis, then Gravimetric Heavy Hydrocarbon analysis is to be performed, and the criterion applied to the higher of the two results.
s10	
AB	The criterion is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
s11	
s12	The criteria for pH in surface soils (0 to 1.5 m) is 5 - 9, whereas the criteria for pH in sub-surface soils (> 1.5 m depth) is 5 - 11.
AB	The criterion is applicable to Total PCBs, and the individual aroclors should be added for comparison.
s14	
AB	Criterion is applicable to PHC in the F2 range minus any naphthalene. If naphthalene is not analyzed for, the criterion is applied to F2.
s15	
s16	The boron standards are for hot water soluble extract for all surface soils. For subsurface soils the standards are for total boron (mixed strong acid digest), as ecological criteria are not considered.
AB	The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s3	
AB	Criterion is applicable to PHC in the F1 range minus any BTEX.
s7	
AB	Criterion is applicable to PHC in the F3, minus any PAHs (other than naphthalene). If PAHs have not been measured, the criterion is applied to F3.
s8	
RPD	Relative Percent Difference
nc	RPD is not calculated if one or more values is non-detect, or if one or more values is less than five times the reportable detection limit
65.00%	RPD exceeds cutoff criteria of 50.00% for soil

Table 6
Monitoring Well Groundwater Analytical Results
Boteler Berm
City of Ottawa

Notes:

Amended O.Reg 153/04	Province of Ontario "Soil, Ground Water and Sediment Standards for use under Part XV.1 of the Environmental Protection Act" Amended (April 15, 2011) Site Condition Standards
A	MOE Table 3 - All Types of Property Use - Coarse Textured Soils
6.5^A	Concentration exceeds the indicated standard.
15.2	Concentration was detected but did not exceed applicable standards.
< 0.50	Laboratory estimated quantitation limit exceeded standard.
< 0.03	The analyte was not detected above the laboratory estimated quantitation limit.
n/v	No standard/guideline value.
nc	RPD is not calculated if one or more values is non-detect, or if one or more values is less than five times the reportable detection limit.
-	Parameter not analyzed / not available.
s1	The criterion is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s3	The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s7	Criterion is applicable to PHC in the F1 range minus any BTEX.
s8	Criterion is applicable to PHC in the F3, minus any PAHs (other than naphthalene). If PAHs have not been measured, the criterion is applied to F3.
s10	If baseline is not reached during F4 analysis, then Gravimetric Heavy Hydrocarbon analysis is to be performed, and the criterion applied to the higher of the two results.
s11	The criterion is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
s14	The criterion is applicable to Total PCBs, and the individual aroclors should be added for comparison.
s15	Criterion is applicable to PHC in the F2 range minus any naphthalene. If naphthalene is not analyzed for, the criterion is applied to F2.
1	Water sample included significant sediment amount that was included in extraction process. This is expected to result in reduced accuracy of the reported result
2	Elevated reporting limits due to limited sample volume.
3	Sample was filtered through a 0.45 um membrane filter in the laboratory prior to extraction/analysis.

Table 7
2014 Borehole PAH Bulk Soil Analytical Results
Boteler Berm
City of Ottawa

Sample Location			BH14-4	BH14-5	BH14-6
Sample Date			05-Mar-2014	05-Mar-2014	05-Mar-2014
Sample ID			BH14-4 SS2	BH14-5 SS1	BH14-6 SS1
Sample Depth			1.52 - 2.59 m	0 - 1.52 m	0 - 1.52 m
Sampling Company			STANTEC	STANTEC	STANTEC
Laboratory			PARACEL	PARACEL	PARACEL
Laboratory Work Order			1414215	1414215	1414215
Laboratory Sample ID		Amended	1414215-01	1414215-02	1414215-03
Sample Type	Units	O.Reg 153/04	Soil	Soil	Soil
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	µg/g	0.072 ^A 7.9 ^B	4.24 ^A	0.15 ^A	<0.02
Acenaphthylene	µg/g	0.093 ^A 0.15 ^B	21.7 ^{AB}	0.37 ^{AB}	0.06
Anthracene	µg/g	0.16 ^A 0.67 ^B	16.6 ^{AB}	0.8 ^{AB}	<0.02
Benzo(a)anthracene	µg/g	0.36 ^A 0.5 ^B	29.8 ^{AB}	1.5 ^{AB}	0.02
Benzo(a)pyrene	µg/g	0.3 ^A 0.3 ^B	24.1 ^{AB}	1.16 ^{AB}	<0.02
Benzo(b)fluoranthene	µg/g	0.47 ^A 0.78 ^B	62.8 ^{AB}	2.06 ^{AB}	0.05
Benzo(g,h,i)perylene	µg/g	0.68 ^A 6.6 ^B	15.4 ^{AB}	0.73 ^A	<0.02
Benzo(k)fluoranthene	µg/g	0.48 ^A 0.78 ^B	18.7 ^{AB}	0.91 ^{AB}	<0.02
1,1-Biphenyl	µg/g	0.05 ^A 0.31 ^B	3.31 ^{AB}	0.08 ^A	<0.02
Chrysene	µg/g	2.8 ^A 7 ^B	35 ^{AB}	1.63	0.02
Dibenzo(a,h)anthracene	µg/g	0.1 ^A 0.1 ^B	4.95 ^{AB}	0.23 ^{AB}	<0.02
Fluoranthene	µg/g	0.56 ^A 0.69 ^B	153 ^{AB}	4.96 ^{AB}	0.06
Fluorene	µg/g	0.12 ^A 62 ^B	12.8 ^A	0.29 ^A	<0.02
Indeno(1,2,3-cd)pyrene	µg/g	0.23 ^A 0.38 ^B	14.1 ^{AB}	0.66 ^{AB}	0.04
Methylnaphthalene (Total)	µg/g	0.59 ^A 0.99 ^B	18.5 ^{AB}	0.32	<0.04
Methylnaphthalene, 1-	µg/g	^A _{s3} ^B _{s3}	9.87 ^{AB}	0.12	<0.02
Methylnaphthalene, 2-	µg/g	^A _{s3} ^B _{s3}	8.62 ^{AB}	0.2	<0.02
Naphthalene	µg/g	0.09 ^A 0.6 ^B	4.32 ^{AB}	0.31 ^A	<0.01
Phenanthrene	µg/g	0.69 ^A 6.2 ^B	127 ^{AB}	3.25 ^A	0.03
Pyrene	µg/g	1 ^A 78 ^B	123 ^{AB}	4.12 ^A	0.06
See notes on last page.					

Table 7
Borehole/Monitoring Well Soil Analytical Results
Boteler Berm
City of Ottawa

Notes:

`	Province of Ontario "Soil, Ground Water and Sediment Standards for use under Part XV.1 of the Environmental Protection Act" Amended (April 15, 2011) Site Condition Standards
A	MOE Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use
B	MOE Table 3 - Residential / Parkland / Institutional Property Use - Coarse Textured Soils
C	MOE Table 3 - All Types of Property Use - Coarse Textured Soils (Groundwater)
6.5^A	Concentration exceeds the indicated standard.
15.2	Concentration was detected but did not exceed applicable standards.
< 0.50	Laboratory estimated quantitation limit exceeded standard.
< 0.03	The analyte was not detected above the laboratory estimated quantitation limit.
n/v	No standard/guideline value.
^{AB} ₃₃	The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Table 8
2014 Borehole PAH Leachate Analytical Results
Boteler Berm
City of Ottawa

Sample Location		BH14-4	BH14-5	BH14-6
Sample Date		05-Mar-2014	05-Mar-2014	05-Mar-2014
Sample ID		BH14-4 SS2	BH14-5 SS1	BH14-6 SS1
Sample Depth		1.52 - 2.59 m	0 - 1.52 m	0 - 1.52 m
Sampling Company		STANTEC	STANTEC	STANTEC
Laboratory		PARACEL	PARACEL	PARACEL
Laboratory Work Order		1414092	1414092	1414092
Laboratory Sample ID		1414092-01	1414092-02	1414092-03
Sample Type	Units	Leachate	Leachate	Leachate
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	µg/L	15.8	<0.50	<0.50
Acenaphthylene	µg/L	37.5	<0.50	<0.10
Anthracene	µg/L	11.5	<0.10	<0.10
Benzo(a)anthracene	µg/L	0.46	<0.10	<0.10
Benzo(a)pyrene	µg/L	<0.10	<0.10	<0.10
Benzo(b)fluoranthene	µg/L	<0.50	<0.50	<0.50
Benzo(g,h,i)perylene	µg/L	<0.50	<0.50	<0.50
Benzo(k)fluoranthene	µg/L	<0.50	<0.50	<0.50
1,1-Biphenyl	µg/L	14	<0.50	<0.50
Chrysene	µg/L	<0.50	<0.50	<0.50
Dibenzo(a,h)anthracene	µg/L	<0.50	<0.50	<0.50
Fluoranthene	µg/L	14.5	<0.10	<0.10
Fluorene	µg/L	71.2	<0.50	<0.50
Indeno(1,2,3-cd)pyrene	µg/L	<0.50	<0.50	<0.50
Methylnaphthalene (Total)	µg/L	56.4	<1.0	<1.0
Methylnaphthalene, 1-	µg/L	30.7	<0.50	<0.50
Methylnaphthalene, 2-	µg/L	25.7	<0.50	<0.50
Naphthalene	µg/L	53.5	<0.50	<0.50
Phenanthrene	µg/L	79.5	<0.50	<0.50
Pyrene	µg/L	7.1	<0.10	<0.10

Notes:

Table 9
Maximum Soil Concentrations
Boteler Berm
City of Ottawa

Parameter	Units	Sample Location	Sample Depth (metres)	Maximum Detectable Result
General Chemistry				
Electrical Conductivity, Lab	µS/cm	BH13-9	3.05 - 3.81	5250
Percent Solids	%wt	TP26	0 - 0.5	95.3
pH	S.U.	MW13-1	1.52 - 2.28	7.95
Sodium Adsorption Ratio (SAR)	none	BH13-9	3.05 - 3.81	35.6
Petroleum Hydrocarbons				
PHC F1 (C6-C10 range)	µg/g	TP19	1 - 1.5	99
PHC F2 (>C10-C16 range)	µg/g	TP19	1 - 1.5	469
PHC F3 (>C16-C34 range)	µg/g	TP26	0 - 0.5	1270
PHC F4 (>C34-C50 range)	µg/g	BH13-6	0 - 1.52	241
Metals				
Antimony	µg/g	TP11	0 - 0.5	9.6
Arsenic	µg/g	TP21	1 - 1.5	31.7
Barium	µg/g	TP5	0 - 0.5	494
Boron	µg/g	TP11	0 - 0.5	8.2
Boron (Available)	µg/g	TP11	1 - 1.5	1.2
Cadmium	µg/g	TP5	0 - 0.5	0.6
Chromium (Hexavalent)	µg/g	BH13-5	0 - 1.07	1
Chromium (Total)	µg/g	TP16	2 - 2.5	37.4
Cobalt	µg/g	TP16	2 - 2.5	9.6
Copper	µg/g	TP7	1 - 1.5	506
Lead	µg/g	TP5	0 - 0.5	903
Mercury	µg/g	TP17	1.5 - 2	3.9
Molybdenum	µg/g	TP21	1 - 1.5	5.2
Nickel	µg/g	TP21	1 - 1.5	26.1
Silver	µg/g	TP19	0 - 0.5	0.7
Thallium	µg/g	TP21	1 - 1.5	1.1
Vanadium	µg/g	BH13-9	3.05 - 3.81	43.3
Zinc	µg/g	TP8	1.5 - 2	757
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	µg/g	BH14-4	1.5 - 2.6	4.24
Acenaphthylene	µg/g	BH14-4	1.5 - 2.6	21.7
Anthracene	µg/g	Lift 5	1.22-1.50	40.8
Benzo(a)anthracene	µg/g	TP10	0 - 0.5	44.4
Benzo(a)pyrene	µg/g	TP10	0 - 0.5	34.4
Benzo(b)fluoranthene	µg/g	TP10	0 - 0.5	67.5
Benzo(g,h,i)perylene	µg/g	TP10	0 - 0.5	21.4
Benzo(k)fluoranthene	µg/g	TP10	0 - 0.5	26.7
Biphenyl	µg/g	BH14-4	1.5 - 2.6	3.31
Chrysene	µg/g	TP10	0 - 0.5	44.2
Dibenzo(a,h)anthracene	µg/g	TP10	0 - 0.5	5.85
Fluoranthene	µg/g	BH14-4	1.5 - 2.6	153
Fluorene	µg/g	BH14-4	1.5 - 2.6	12.8
Indeno(1,2,3-cd)pyrene	µg/g	TP10	0 - 0.5	20.8
Methylnaphthalene (Total)	µg/g	BH14-4	1.5 - 2.6	18.5
Methylnaphthalene, 1-	µg/g	BH14-4	1.5 - 2.6	9.87
Methylnaphthalene, 2-	µg/g	BH14-4	1.5 - 2.6	8.62
Naphthalene	µg/g	TP28	1 - 1.5	8.89
Phenanthrene	µg/g	Lift 5	1.22-1.50	152
Pyrene	µg/g	BH14-4	1.5 - 2.6	123
Volatile Organic Compounds				
Benzene	µg/g	TP12	1 - 1.5	0.05
Ethylbenzene	µg/g	TP12	1 - 1.5	0.27
Toluene	µg/g	TP12	1 - 1.5	0.69
Xylene, m & p-	µg/g	TP12	1 - 1.5	2.29
Xylene, o-	µg/g	TP12	1 - 1.5	0.29
Xylenes, Total	µg/g	IP12	1 - 1.5	2.57

Table 10
Maximum Groundwater Concentrations
Boteler Berm
City of Ottawa

Parameter	Units	Sample Location	Maximum Detectable Result		
General Chemistry					
Chloride	mg/L	MW13-11	1590		
pH	S.U.	MW13-2	7.3		
Petroleum Hydrocarbons					
PHC F3	µg/L	MW14-1	3050		
PHC F4	µg/L	MW14-1	1760		
Metals					
Antimony	µg/L	MW13-13	3.5		
Arsenic	µg/L	MW14-3	3		
Barium	µg/L	MW14-2	134		
Boron	µg/L	MW14-3	331		
Chromium (Total)	µg/L	MW14-3	22		
Cobalt	µg/L	MW14-2	5.4		
Copper	µg/L	MW14-3	11.9		
Lead	µg/L	MW13-13	0.5		
Molybdenum	µg/L	MW14-3	12.3		
Nickel	µg/L	MW13-11	15		
Selenium	µg/L	MW14-2	19		
Sodium	µg/L	MW14-3	2420000		
Thallium	µg/L	MW14-2	0.2		
Uranium	µg/L	MW14-3	16.3		
Vanadium	µg/L	MW14-3	23.7		
Zinc	µg/L	MW13-11	25		
Polycyclic Aromatic Hydrocarbons					
		Unfiltered	Filtered	Unfiltered	Filtered
Acenaphthene	µg/L	MW14-1	MW13-10	1.05	< 0.25
Acenaphthylene	µg/L	MW14-1	MW13-10	2.88	< 0.25
Anthracene	µg/L	MW14-1	MW14-3	5.43	0.03
Benzo(a)anthracene	µg/L	MW14-1	MW13-10	18.1	< 0.05
Benzo(a)pyrene	µg/L	MW14-1	MW13-10	17.3	< 0.05
Benzo(b)fluoranthene	µg/L	MW14-1	MW13-10	31	< 0.25
Benzo(g,h,i)perylene	µg/L	MW14-1	MW13-10	11.9	< 0.25
Benzo(k)fluoranthene	µg/L	MW14-1	MW13-10	12.3	< 0.25
Biphenyl	µg/L	MW13-10	MW13-10	0.42	< 0.25
Chrysene	µg/L	MW14-1	MW13-10	21.9	< 0.25
Dibenzo(a,h)anthracene	µg/L	MW14-1	MW13-10	3.42	< 0.25
Fluoranthene	µg/L	MW14-1	MW14-3	44	0.04
Fluorene	µg/L	MW14-1	MW13-10	1.49	< 0.25
Indeno(1,2,3-cd)pyrene	µg/L	MW14-1	MW13-10	10.4	< 0.25
Methylnaphthalene (Total)	µg/L	MW14-1	MW14-1	0.53	0.2
Methylnaphthalene, 1-	µg/L	MW14-1	MW13-10	0.27	< 0.25
Methylnaphthalene, 2-	µg/L	MW14-1	MW13-10	0.26	< 0.25
Naphthalene	µg/L	MW14-1	MW13-10	0.49	< 0.25
Phenanthrene	µg/L	MW14-1	MW13-10	18.8	< 0.25
Pyrene	µg/L	MW14-1	MW14-3	38.4	0.04

Two samples were collected from three monitoring wells on April 24, 2014, to confirm that PAH exceedances measured on April 10, 2014, were due to sediment in the sample and not dissolved concentrations of PAHs. One sample was analyzed unfiltered and one sample was analyzed after filtering by the lab.

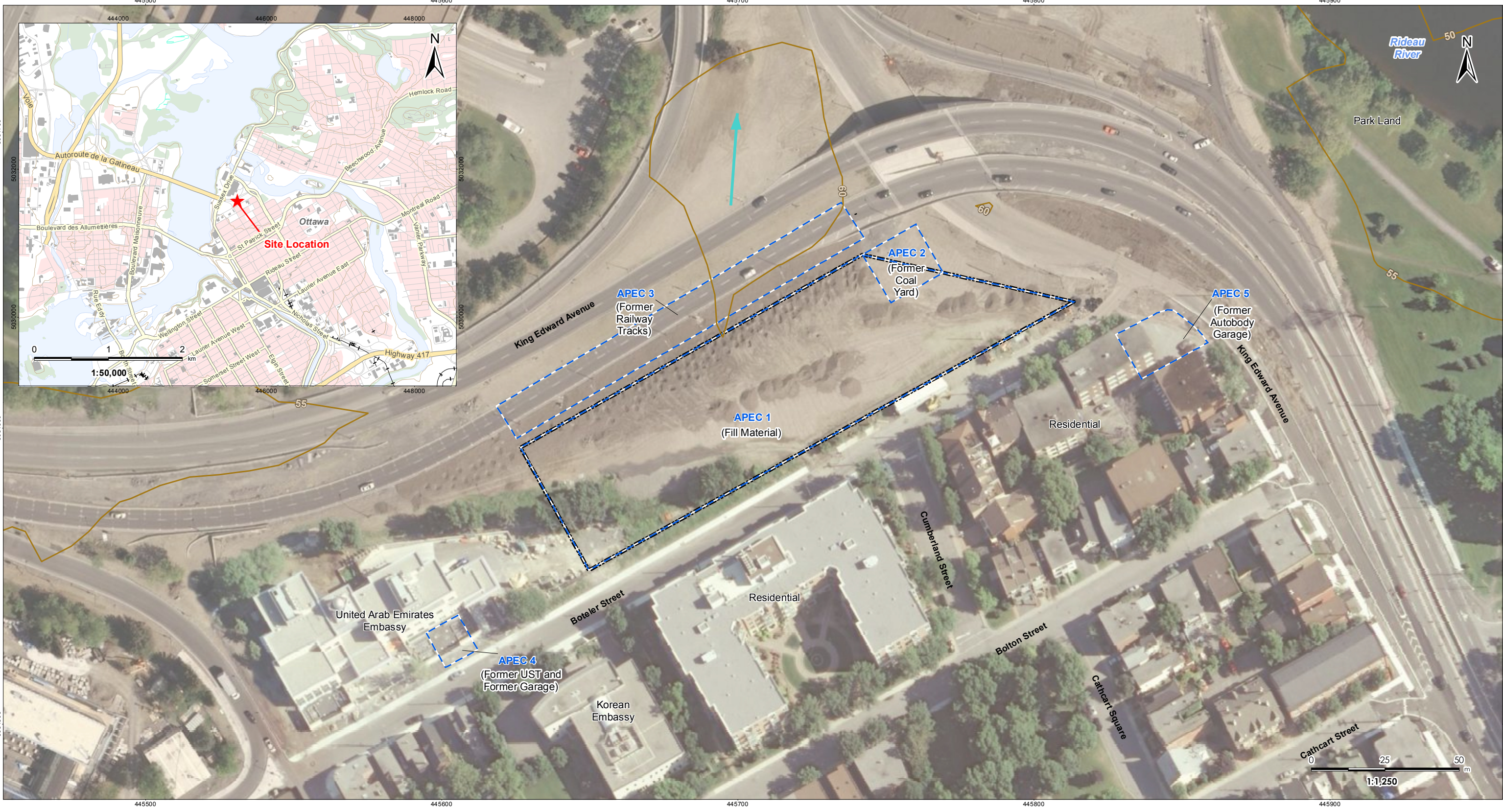
**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**





Appendix B
FIGURES
June 27, 2014

Appendix B

FIGURES

V:\01225\active\122510670_City of Ottawa_BotelerBerm_GIS\MXD\PhaseII\22510670_PhII_Fig01_SitePlanAndCSM.mxd
 Revised: 2014-06-27 By: ncrulkshank 5031500



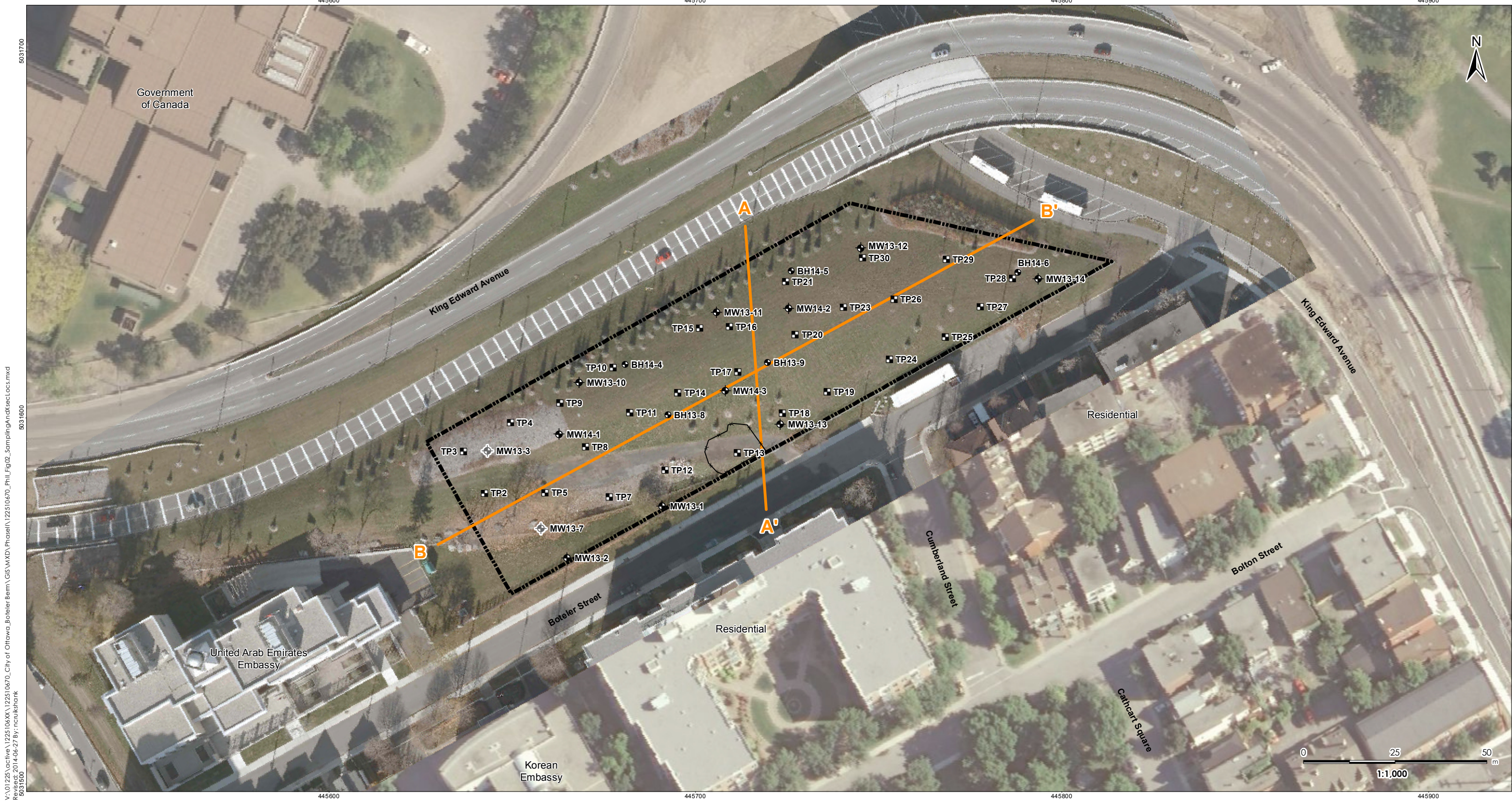
- Legend**
-  Anticipated Direction of Groundwater Flow
 -  Topographic Contour (mAMSL)
 -  Area of Potential Environmental Concern (APEC)
 -  Approximate Site Property Boundary

- NOTES**
1. Coordinate System: NAD 1983 UTM Zone 18N
 2. Site Airphoto: City of Ottawa, 2013.
 3. Orthoimagery © First Base Solutions, Ottawa Division 2008.
 4. Topography derived from the MNR Digital Elevation Model - Version 2.0.0 - Provincial Tiled Dataset (DEM) © Queen's Printer for Ontario, 2006.

Client/Project
 City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.
 1

Title
Site Plan and Conceptual Site Model



V:\01225\active\122510670_City of Ottawa_BotelerBerm_GIS\MXD_PhaseII\122510670_PhII_Fig02_SamplingAndSecLocs.mxd
 Revised: 2014-06-27 By: ncrnkshank
 5031500



Legend

- Borehole
- ⊕ Monitoring Well
- ⊕ Monitoring Well (Decommissioned)
- Test Pit
- Remediation Excavation Limits
- ⬡ Approximate Site Property Boundary
- Cross-Section Location

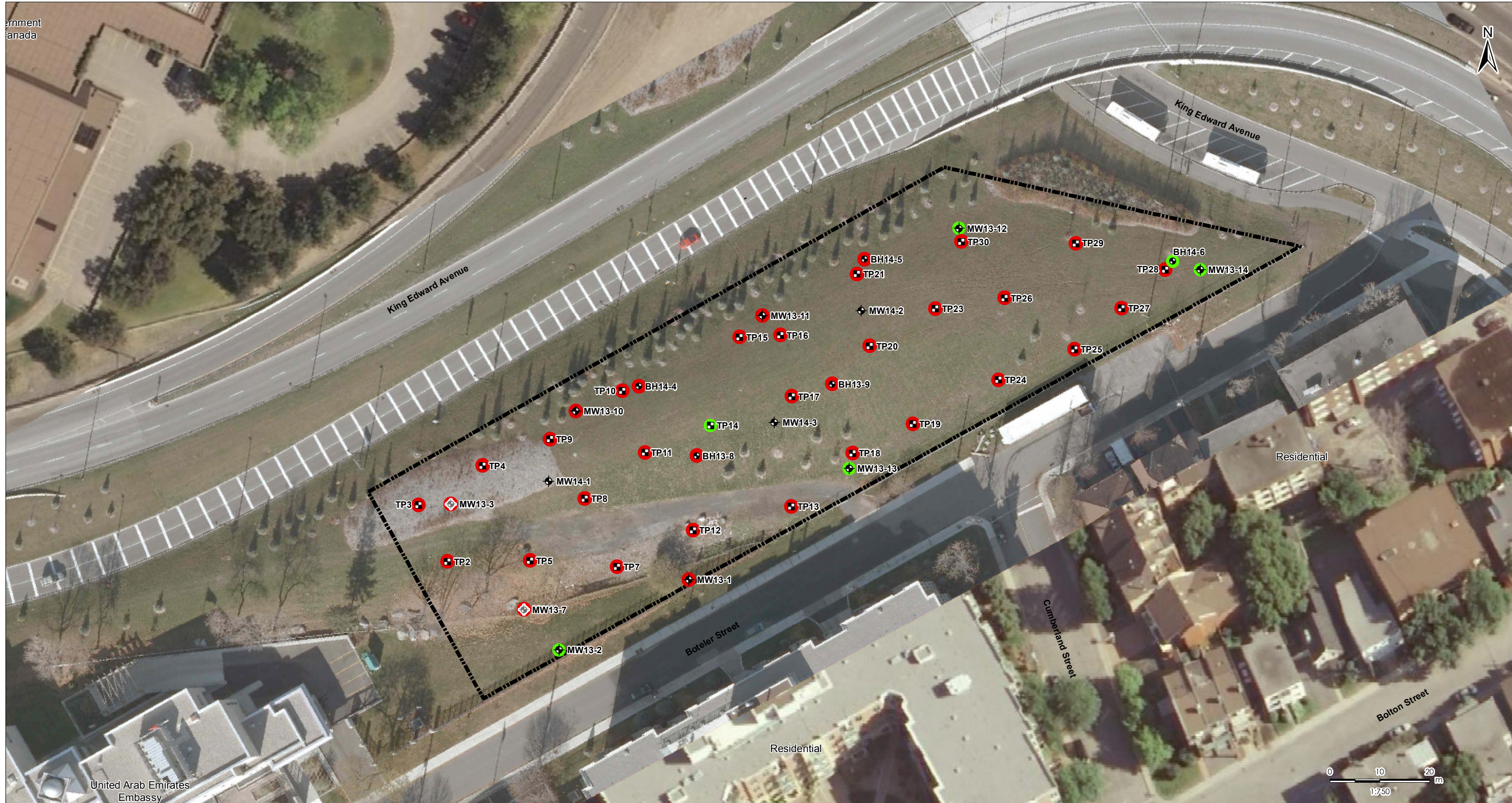
Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.

Client/Project
 City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.
 2

Title
Sampling and Cross-Section Locations



V:\012251\active\122510670_City of Ottawa_Boteler Berm_GIS\MXD\Phase\122510670_Ph1\Fig03_Exc30.mxd
 Revised: 2014-06-27 By: ncnulshank



Legend

- Approximate Site Property Boundary
- Borehole
- Monitoring Well
- Monitoring Well (Decomissioned)
- Test Pit

- Parameters Tested Do Not Exceed Regulatory Standards
- One of More Parameters Tested Exceed Regulatory Standards

* MW 14-1, 14-2 & 14-3 were not sampled for soil.

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.

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City of Ottawa
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 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.

3

Title

Soil Analytical Results



V:\01225\active\122510670_City of Ottawa_BotelerBerm_GIS\MXD\PhaseII\122510670_PhII_Fig04_ExcGW.mxd
 Revised: 2014-06-27 By: ncaukshank
 5031500



Legend

- Monitoring Well
- Monitoring Well (Decommissioned)
- Approximate Site Property Boundary
- Parameters Tested Do Not Exceed Regulatory Standards
- One or More Parameters Tested Exceed Regulatory Standards

(CNL) Could not locate in April 2014; dry in July 2013

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.

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 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
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 Boteler St, Ottawa, ON

Figure No.
4

Title

Groundwater Analytical Results

445700

445800



V:\012251\active\122510670_City of Ottawa_BotelerBerm\GIS\MXD\Phase1\122510670_Ph1\Fig05a_GWContour.mxd
 Revised: 2014-06-27 By: ncrulshank 5031800

5031800



Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.
4. Monitoring wells were not monitored on same date due to access restrictions. Groundwater contours and flow direction are estimates only and should be confirmed through a single monitoring event.

Legend

- Monitoring Well (Monitored July 2013)
- Monitoring Well (Monitored April 2013)
- Approximate Sewer Manhole Location
- Easement
- Sewer Line
- Groundwater Level Elevation (m AMSL)
- Groundwater Flow Direction
- Approximate Site Property Boundary
- (51.19)** Groundwater Elevation at Well (m AMSL)

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 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.
 5a

Title
**Groundwater Flow Diagram
 July 2013**

445700

445800



V:\01225\active\122510670_City of Ottawa_BotelerBerm\GIS\MXD\PhaseII\122510670_PhII_Fig05b_CWContour.mxd
 Revised: 2014-06-27 By: ncaulkshank 5031800

445700

445800

June 2014
 Project No.: 122510670



Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.

Legend

- Monitoring Well
 - Approximate Sewer Location
 - Easement
 - Sewer Line
 - Interpreted Groundwater Flow Direction
 - Groundwater Elevation (m AMSL)
 - Approximate Site Property Boundary
- (51.19)** Groundwater Elevation at Well (m AMSL)
(CNL) Could not locate

Client/Project
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 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.
 5b

Title
Groundwater Flow Diagram
April 2014

V:\01225\active\1225106xx\122510670_City of Ottawa Boteler Berm\GIS\MXD\Phase1\122510670_Phil_Fig 06_xSecAA_ExcavSO.mxd
 Revised: 2014-06-27 By: ncuikshank



Legend

- Well ID (Offset)
- Stratigraphy
- Water Level (April 24, 2014)
- Well Screen
- Discontinuous Sand/Silty Layer
- Ground Surface
- Known Level of Bedrock
- Inferred Level of Bedrock

- Parameters Tested Do Not Exceed Regulatory Standards
- One or More Parameters Tested Exceed Regulatory Standards
- Stratigraphy**
- Fill
- Sand or Silty Sand
- Limestone Bedrock

* MW 14-2 & 14-3 were not sampled for soil.

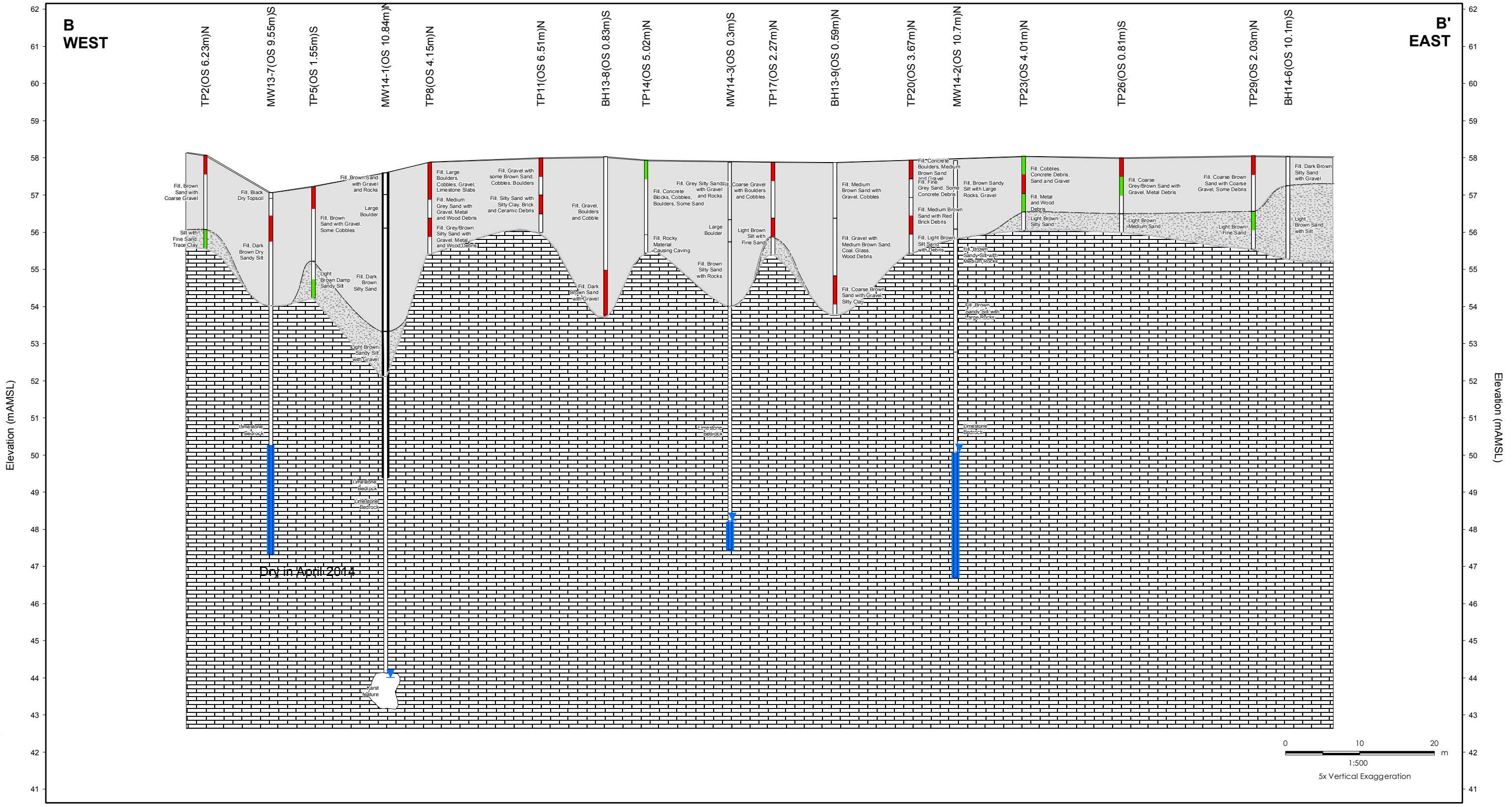
Client/Project
 City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St. Ottawa, ON

Figure No.
 6

Title

Soil Cross-Section A-A'

V:\01225\active\122510670_City of Ottawa Boteler Berm\GIS\MXD\Phase1\122510670_Ph1_Fig 07 -SectBB_Exc6SO.mxd
 Revised: 2014-06-27 By: nctukshank



Legend

- TP18 (OS 6 m)
- Well ID (Offset)
- Stratigraphy
- Water Level (April 24, 2014)
- Well Screen

- Discontinuous Sand/Silt Layer
- Ground Surface
- - - Level of Inferred Bedrock
- Level of Known Bedrock
- █ Casing on top of Packer

- █ Parameters Tested Do Not Exceed Regulatory Standards
- █ One or More Parameters Tested Exceed Regulatory Standards
- Stratigraphy**
- █ Fill
- █ Limestone Bedrock
- █ Sand or Silty Sand

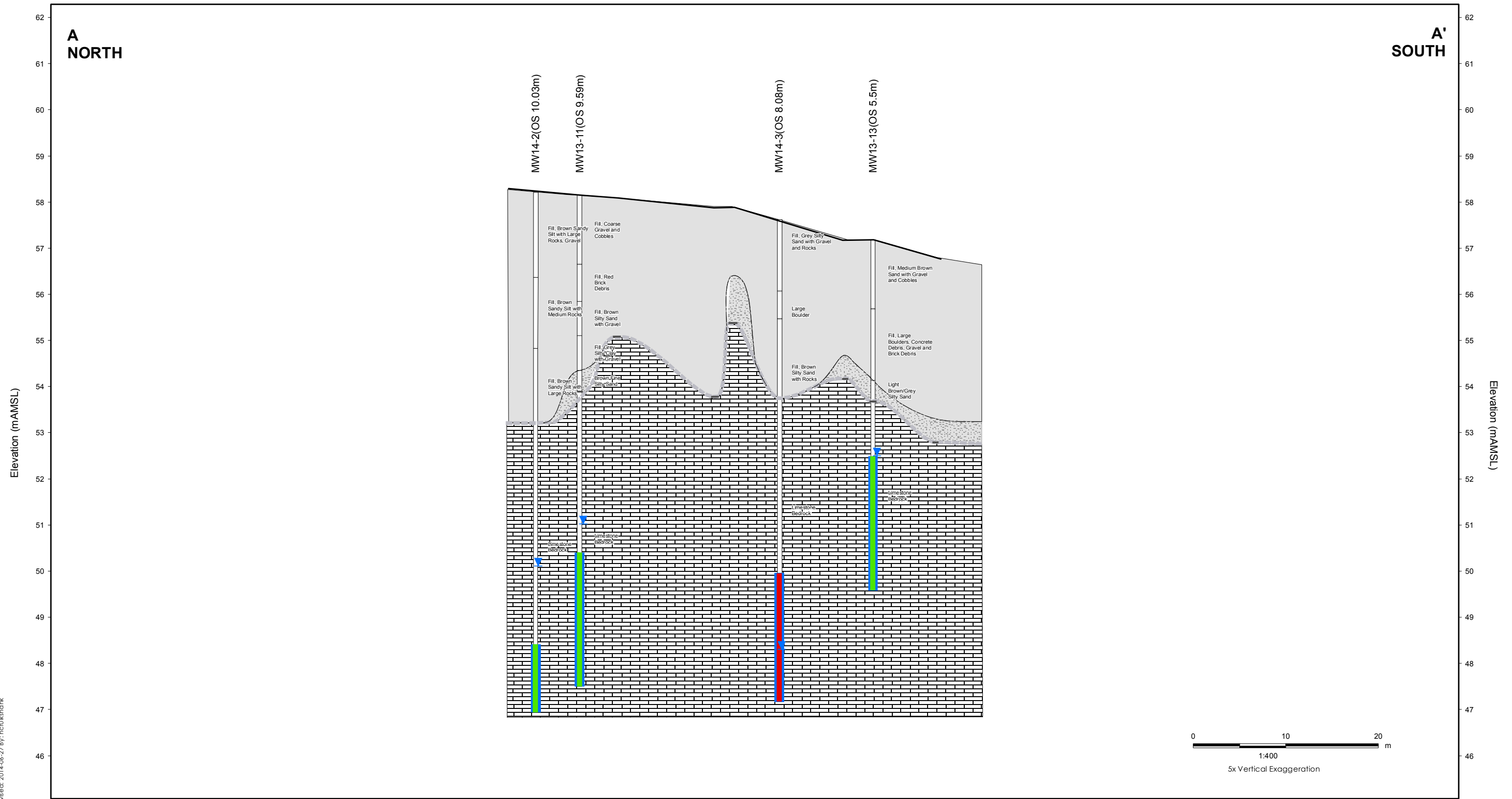
* MW 14-1, 14-2 & 14-3 were not sampled for soil.

Client/Project
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 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St. Ottawa, ON

Figure No.
 7
 Title

Soil Cross-Section B-B'

V:\012251\active\122510670_City of Ottawa Boteler Berm\GIS\MXD\Phase1\122510670_Ph1_Fig08_xSecAA_ExcGW.mxd
 Revised: 2014-06-27 By: ncuikmark



Legend

- TP 18 (OS m) Well ID (Offset)
- Sand Stratigraphy
- Water Level (April 24, 2014)
- Well Screen

- Discontinuous Sand/Silty Layer
- Ground Surface
- Known Level of Bedrock
- Inferred Level of Bedrock
- Parameters Tested Do Not Exceed Regulatory Standards
- One or More Parameters Tested Exceed Regulatory Standards
- Fill
- Silty Sand
- Limestone Bedrock

Notes

1. Borehole and test pit logs removed for clarity.

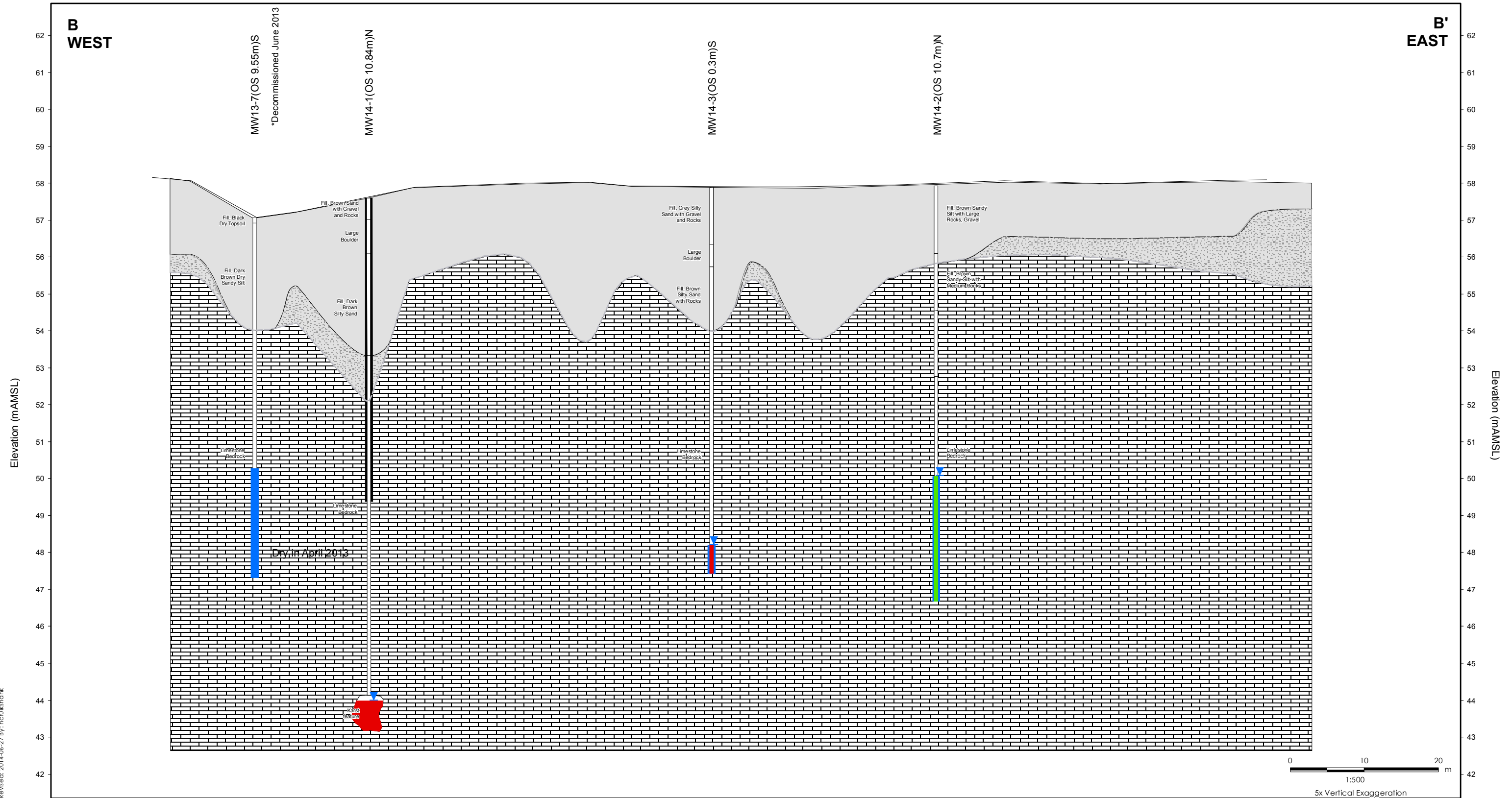
Client/Project
 City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St. Ottawa, ON

Figure No.
 8

Title

Groundwater Cross-Section A-A'

V:\0125\active\122510670\122510670_City of Ottawa Boteler Berm\GIS\MXD\Phase1\122510670_Ph1_Fig09_5secBB_ExcGW.mxd
 Revised: 2014-06-27 By: ncrnkshank



Legend

- Ground surface
- - - Discontinuous Sand/Silt Layer
- - - Level of Inferred Bedrock
- █ Casing on top of Packer
- TP 18 (OS m)
- Stratigraphy
- Water Level (April 24, 2014)
- Well Screen
- Well ID (Offset)
- Parameters Tested Do Not Exceed Regulatory Standards
- One or More Parameters Tested Exceed Regulatory Standards
- Fill
- Sand or Silty Sand
- Limestone Bedrock

Notes

1. Borehole and test pit logs removed for clarity.

Client/Project
 City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St. Ottawa, ON

Figure No.
 9
 Title

Groundwater Cross-Section B-B'

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix C
SURVEY OF PHASE TWO PROPERTY
(TO BE INCLUDED IN SUBSEQUENT VERSIONS OF THE REPORT)
June 27, 2014

Appendix C

**SURVEY OF PHASE TWO PROPERTY
(TO BE INCLUDED IN SUBSEQUENT VERSIONS OF THE REPORT)**

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix D
SAMPLING AND ANALYSIS PLAN
June 27, 2014

Appendix D

SAMPLING AND ANALYSIS PLAN

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Appendix D
SAMPLING AND ANALYSIS PLAN
June 27, 2014

D.1 SAMPLING AND ANALYSIS PLAN

The Phase Two Environmental Site Assessment (ESA) was conducted with the following objective:

- To identify the presence, location and concentration of contaminants of concern (COCs) in soil and groundwater that could potentially be associated with areas of potential environmental concern (APECs) identified in the Phase One ESA (Stantec, 2013).

To meet the objective outlined above, the following sampling and analysis plan was developed for the Phase Two ESA of the vacant land north of Boteler Street, Ottawa, Ontario:

- Clear underground services at the Phase Two Property using private and public utility locators prior to starting intrusive investigations.
- Excavate approximately 30 test pits at the approximate locations shown in Table D-1 below. Test pit locations may be adjusted based on the locations of underground utilities. Grab soil samples will be collected of each distinct stratigraphic unit using the bucket of the excavator.
- Advance seven boreholes to inferred bedrock, and complete 12 additional boreholes as monitoring wells into the bedrock. Proposed locations of the boreholes and monitoring wells are described in Table D-1.
- Complete field observations of visual and olfactory evidence of impacts for collected soil samples. Measure soil headspace vapour concentrations for soil samples collected from test pits and boreholes.
- Submit selected soil and samples for laboratory analysis of the parameters indicated on Table D-1. Samples submitted for laboratory analysis will be based on sample location and depth, site stratigraphy, the results of visual and olfactory observations and vapour screenings, program objectives, and known information about the potential contaminant distribution at the Phase Two Property.
- Monitor available wells for combustible vapour concentration, depth to water, and presence/absence of petroleum hydrocarbon product.
- Sample on-site wells with sufficient groundwater volume using low flow techniques (where possible). Monitor physical parameters of: temperature, pH, dissolved oxygen, turbidity, oxidation/reduction potential, conductivity during sampling. Submit groundwater samples for laboratory analysis of the parameters indicated on Table D-1.
- Survey all newly installed test pits and boreholes/wells for accurate placement on site plans and obtain vertical elevations of all sampling locations.
- Implement the following Quality Assurance/Quality Control (QA/QC) measures:

FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Appendix D
SAMPLING AND ANALYSIS PLAN
June 27, 2014

- For quality QA/QC purposes, analyze field duplicate soil and groundwater samples on an approximate 1 in 10 basis for the analyses mentioned above;
 - Clean all non-dedicated sampling equipment prior to use and between sampling locations; and
 - Calibrate vapour screening equipment on a daily basis, at the beginning of each day of sampling.
- Complete the above tasks in general accordance with Stantec's Standard Operating Procedures.

The overall data quality objective (DQO) for the investigation is to collect data that are precise, accurate, reproducible, complete, and suitable for comparison with the Table 3 Site Condition Standards.

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix D
SAMPLING AND ANALYSIS PLAN
June 27, 2014

Sampling Location ID	Location (see Figure 2)	Proposed Tasks	Rationale	Parameters to be Analyzed (Soil and/or Groundwater)
TP3, TP4, TP9, MW13-3, MW13-10	Western third of the Phase Two Property, along north property boundary	Collect soil samples from the four locations. Collect groundwater sample from MW13-10.	Investigate soil and groundwater quality at an area of fill deposition and the former railway tracks.	PAHs, PHC, VOCs, metals, EC, SAR
TP2, TP5, TP8	Western third of the Phase Two Property, central portion of the section.	Collect soil samples from the three locations.	Investigate soil quality at an area of fill deposition.	PAHs, PHC, VOCs, metals, EC, SAR,
TP1*, TP6*, TP7, MW13-7, MW13-2	Western third of the Phase Two Property, along the south property line.	Collect soil samples from the test pit location. Use groundwater data from existing well(s).	Investigate soil and groundwater quality at an area of fill deposition and former gasoline UST and former garage.	PAHs, PHC, VOCs, metals, EC, SAR, pH
TP10, TP15, TP16, MW13-11	Central third of the Phase Two Property, along the north property line.	Collect soil samples from the four locations. Collect a groundwater sample from the newly installed well.	Investigate soil and groundwater quality at an area of fill deposition and the former railway tracks.	PAHs, PHC, VOCs, metals, EC, SAR
TP11, BH13-8, TP14, TP17, BH13-9	Central third of the Phase Two Property, central portion of the section.	Collect soil samples from the five locations.	Investigate soil quality at an area of fill deposition.	PAHs, PHC, VOCs, metals, EC, SAR, PCBs
TP12, TP13, TP18, MW13-1, MW13-13	Central third of the Phase Two Property, along the south property line.	Collect soil samples from the four locations. Collect a groundwater sample from the newly installed well.	Investigate soil quality at an area of fill deposition.	PAHs, PHC, VOCs, metals, EC, SAR, pH, PCBs

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix D
SAMPLING AND ANALYSIS PLAN
June 27, 2014

Sampling Location ID	Location (see Figure 2)	Proposed Tasks	Rationale	Parameters to be Analyzed (Soil and/or Groundwater)
TP21, TP22*, TP30, MW13-12	Eastern third of the Phase Two Property, along the north property line.	Collect soil samples from the three locations. Collect a groundwater sample from the newly installed well.	Investigate soil quality at an area of fill deposition, the former railway tracks and former coal storage area. Investigate groundwater quality at the former coal storage area.	PAHs, PHC, VOCs, metals, EC, SAR, pH, PCBs
TP20, TP23, TP26, TP29	Eastern third of the Phase Two Property, central portion of the section.	Collect soil samples from the four locations.	Investigate soil quality at an area of fill deposition.	PAHs, PHC, VOCs, metals, EC, SAR
TP19, TP24, TP25, TP27, TP28, MW13-14	Eastern third of the Phase Two Property, along the south property line.	Collect soil samples from the three locations. Collect a groundwater sample from the newly installed well.	Investigate soil and groundwater quality at an area of fill deposition and former autobody garage.	PAHs, PHC, VOCs, metals, EC, SAR, PCBs
BH14-4, BH14-5, BH14-6	Along the north property line and in the eastern corner of the Phase Two Property	Collect soil samples from the three boreholes.	To obtain leachate results for the Risk Assessment should water samples not be obtained at the Site.	PAHs
MW14-1, MW14-2, MW14-3	One in each of the east-west thirds of the property.	No soil samples to be collected. For groundwater collection only.	To collect groundwater samples.	PHC, VOCs, PAHs, metals

* Please see section 4.4 for reasons why TP1, TP6, and TP22 were not completed as proposed.

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix E
TEST PIT, BOREHOLE AND MONITORING WELL LOGS
June 27, 2014

Appendix E

TEST PIT, BOREHOLE AND MONITORING WELL LOGS

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING April 12, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 56.42 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	56.53					● 20	▲ 100	40	60	80			
	56.2	Black/brown, dry TOPSOIL with trace organics.			2							SS 1	
1		Dark brown, dry, sand with minor silt, FILL.			4							SS 2	
	55.0												
2	54.9	Crushed rock, FILL.			6							SS 3	
	54.9	Light grey, dry, medium sand, FILL.			8							SS 4	
3	53.3	Dark brown sand with minor silt, FILL.			10							SS 5	
4		Limestone BEDROCK.			12								
5					14								
6	50.1	Borehole terminated at 6.4 m bgs. Monitoring well installed.			16								
7					18								
8					20								
9					22								
10					24								
11					26								
12					28								
13					30								
14					32								
15					34								
16					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

Bentonite Seal

31 mm, PVC Casing, with Sandpack
31mm, Slotted PVC Screen, with Sandpack

LABORATORY ANALYSES: MW13-1 SS3 submitted for laboratory analysis of VOCs, PAHs, PHC F1 -F4, PCBs, inorganics and metals.

∇ Groundwater Level

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING April 15, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 56.877 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	56.95					● 20	▲ 100	40	60	80			
	56.8	Black, dry, topsoil FILL, with trace organics.			2							SS 1	
1	55.4	Light brown, dry, silty sand with trace clay, FILL.			4							SS 2	
2	55.1	Red/grey, dry, coarse sand with trace silt, FILL. Large rock fragments and clay brick fragments.			6							SS 3	
3	53.8	Brown, dry silty clay, FILL. Limestone BEDROCK.			8							SS 4	
4					10							SS 5	
5					12								
6	50.6	Borehole terminated at 6.4 m bgs. Monitoring well installed.			14								
7					16								
8					18								
9					20								
10					22								
11					24								
12					26								
13					28								
14					30								
15					32								
16					34								
					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

Bentonite Seal

31 mm, PVC Casing, with Sandpack

31mm, Slotted PVC Screen, with Sandpack

LABORATORY ANALYSES: MW13-2 SS3 submitted for laboratory analysis of VOCs, PAHs, PHC F1 -F4, PCBs, inorganics, and metals.

Groundwater Level

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING April 15, 2013 WATER LEVEL April 22, 2013 TPC ELEV. 61.18 CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	60.22	Well decommissioned on June 13, 2013				● 20	▲ 100	40	60	80			
0	59.3	Brown, dry, silty sand with clay FILL.			2							SS 1	Bentonite Seal
1		FILL material			4								
2		-could not be sampled by direct push techniques			6								
3		-air hammered			8								
4	56.0				10								
5	55.5	Dark brown, dry, silty sand with coarse light brown sand, FILL.			14							SS 2	
5	55.0				16							SS 3	
6	54.1	Creosote odour			18								
7		Light brown, dry, clayey silt, FILL.			20								
8		FILL material and fractured bedrock.			22								
8		Limestone BEDROCK.			24								
9					26								
10					28								
11					30								
12					32								
13	47.4	Borehole terminated at 12.8 m. Monitoring well installed.			34								31 mm, PVC Casing, with Sandpack
14					36								31mm, Slotted PVC Screen, with Sandpack
15					38								
16					40								
					42								
					44								
					46								
					48								
					50								
					52								

LABORATORY ANALYSES: MW13-3 SS1 and SS3 were submitted for laboratory analysis of PHC F1 to F4, VOCs, PAH, and metals. MW13-3 SS3 was also submitted for laboratory analysis of pH.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING April 17, 2013 WATER LEVEL April 22, 2013 TPC ELEV. 57.33 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION	
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE				
0	57.49					● 20 ▲ 100	40 200	60 300	80 400					
0	57.4	Brown/black dry topsoil, FILL, with trace organics. Brown, dry silty sand FILL.			2	▲					SS	1		Bentonite Seal
1	56.1				4									
1	55.9	Light grey, dry crushed rock, FILL.			6	▲					SS	2		
2	55.4	Brown, dry, silty sand, FILL, with coarse light brown sand. Limestone BEDROCK.			8									
3					10									
4					12									
5					14									
6					16									
7					18									
8					20									
9					22									
10	47.5				24									
10		Borehole terminated at 10.1 m bgs. Monitoring well installed.			26									
11					28									
					30									
					32									
					34									
					36									

31 mm, PVC Casing, with Sandpack
31mm, Slotted PVC Screen, with Sandpack

LABORATORY ANALYSES: MW13-4 SS1 was submitted for laboratory analysis of PHC F1 to F4, VOCs, PAH, and metals.

Groundwater Level



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING April 17, 2013 WATER LEVEL April 22, 2013 TPC ELEV. 56.96 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.07	Well decommissioned on June 13, 2013				● 20	▲ 100	40	60	80			
0	56.9	Black, dry TOPSOIL, with trace organics.			2							SS 1	Bentonite Seal
1		Dark brown, dry, sandy silt, FILL, with trace clay.			4							SS 2	
2					8							SS 3	
3	54.0	Limestone BEDROCK.			10								31 mm, PVC Casing, with Sandpack 31mm, Slotted PVC Screen, with Sandpack
4					12								
5					14								
6					16								
7					18								
8					20								
9					22								
10	47.3	Borehole terminated at 9.75 m bgs. Monitoring well installed.			24								
11					26								
12					28								
13					30								
14					32								
15					34								
16					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

LABORATORY ANALYSES: MW13-7 SS2 was submitted for laboratory analysis of PHC F1 to F4, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14



BOREHOLE RECORD

BH13-8

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 25, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES		
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE		
0	58.03	No vapour readings due to limited soil recovery in borehole.				● 20	▲ 40	60	80			
		Gravel, boulders and cobble, FILL. Very low recovery.				▲ 100	200	300	400			
1					2						SS	1
2					4						SS	2
3	55.0				6						SS	3
4	53.8	Dark brown SAND with gravel, trace silty clay, FILL. Low recovery			8						SS	4
5					10						SS	5
6					12						SS	6
7		End of borehole at 4.3 mbgs			14							
8					16							
9					18							
10					20							
11					22							
12					24							
13					26							
14					28							
15					30							
16					32							
					34							
					36							
					38							
					40							
					42							
					44							
					46							
					48							
					50							
					52							

LABORATORY ANALYSES: BH13-8 SS6 was submitted for laboratory analysis of PHCs, BTEX, VOCs, metals, PAH, EC/SAR, PCBs. A composite of SS5 and SS6 was submitted for laboratory analysis of FOC.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14



BOREHOLE RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 25, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.87					● 20	▲ 100	40	60	80			
		Medium brown sand with gravel, cobbles and boulders, FILL. Some concrete debris. Low recovery.			2		▲					SS	1
1	56.4				4							SS	2
2		Gravel with medium brown sand. Some coal pieces, glass fragments, and wood debris, FILL. Low recovery.			6							SS	3
3	54.8				8		▲					SS	4
4	53.8	Coarse brown sand with gravel, FILL. Some silty clay above bedrock. Sample refusal.			10							SS	5
		End of borehole at 4.1 mbgs.			12		▲					SS	6
5					14								
6					16								
7					18								
8					20								
9					22								
10					24								
11					26								
12					28								
13					30								
14					32								
15					34								
16					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

LABORATORY ANALYSES: BH13-9 SS5 was submitted for laboratory analysis of PHCs, BTEX, VOCs, metals, PAH, PCBs, EC/SAR. A composite of SS5 and SS6 was submitted for laboratory analysis of FOC. SS3 was submitted for laboratory analysis of FOC.



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 18, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 58.27 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION	
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE				
0	58.28					● 20	▲ 100	40	60	80				
0		Gravel, boulders and concrete debris. Some coarse brown sand, FILL. Low recovery	[Cross-hatch pattern]		2							SS 1		Protective Casing and Bentonite Seal
1	56.8				4							SS 2		
2		Gravel with medium brown sand. Some silt and clay, FILL.	[Cross-hatch pattern]		6							SS 3		
3	55.2				8							SS 4		
4		Brown SILT with medium sand and gravel, FILL. Damp.	[Cross-hatch pattern]		10		▲					SS 5		
5	53.4				12		▲					SS 6		
5		Limestone BEDROCK.	[Brick pattern]		14		▲					SS 7		
6					16									51 mm, Schedule 40, PVC Casing, with Sandpack
7					18									
8					20									
9					22									
10					24									
11					26									
11	46.7			▽	28									
12		End of borehole at 11.6 mbgs. Well was dry during the July 31, 2013 sampling event.			30									
13					32									
14					34									
15					36									
16					38									
16					40									
16					42									
16					44									
16					46									
16					48									
16					50									
16					52									

LABORATORY ANALYSES: MW13-10 SS7 submitted for laboratory analysis of VOCs, BTEX, PHCs, metals, PAH, EC/SAR

▽ Groundwater Level



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 18, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 58.05 CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	58.22					● 20	▲ 100	40	60	80			
0		Coarse gravel and cobbles with concrete debris. Some medium brown sand, FILL.			2								Protective Casing and Bentonite Seal
1	56.7				4							SS 1	
2	55.9	Red brick debris, FILL.			6							SS 2	
3	55.2	Brown silty sand. Damp. Some gravel, FILL.			8							SS 3	
4	54.4	Grey SILTY CLAY with dark brown silt seams. Some gravel. FILL. Damp.			10							SS 4	
4	54.0				12							SS 5	
5		Brown fine SILTY SAND. Grey silty clay above bedrock. Damp.			14							SS 6	51 mm, Schedule 40, PVC Casing, with Sandpack 51 mm, Schedule 40, slot #10, PVC Screen with Sandpack
6		Limestone BEDROCK.			16								
7					18								
8					20								
9					22								
10					24								
11	47.6				26								
12		End of borehole at 10.7 mbgs.			28								
13					30								
14					32								
15					34								
16					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

LABORATORY ANALYSES: MW13-11 SS6 was submitted for laboratory analysis of BTEX, PHCs, VOCs, metals, PAH, EC/SAR. A composite of SS5 and SS6 was submitted for laboratory analysis of FOC.

Groundwater Level

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 25, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 57.877 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0		Could not locate well on April 24, 2014.				● 20	▲ 100	40	60	80			
0		Gravel, boulders, and concrete debris, FILL. Some medium brown sand. Low recovery			2							SS 1	Protective Casing and Bentonite Seal
1		Light brown silty sand with gravel, FILL. Damp.			4							SS 2	
2		Brown silty sand with gravel, FILL. Damp.			6	▲						SS 3	
3		Light brown/grey SILTY CLAY. Wet.			8	▲						SS 4	
4		Limestone BEDROCK.			10	▲						SS 5	
5					12	▲						SS 6	
6					14								51 mm, Schedule 40, PVC Casing, with Sandpack 51 mm, Schedule 40, slot #10, PVC Screen with Sandpack
7					16								
8					18								
9					20								
10					22								
11					24								
12					26								
13					28								
14					30								
15					32								
16					34								
11		End of borehole at 10.7 mbgs. Well was dry during the July 31, 2013 sampling event.			36								
12					38								
13					40								
14					42								
15					44								
16					46								
17					48								
18					50								
19					52								

LABORATORY ANALYSES: MW13-12 SS5 was submitted for laboratory analysis of PHCs, BTEX, VOCs, metals, PAH, PCB, EC/SAR, pH. A composite of SS5 and SS6 was submitted for laboratory analysis of FOC. SS1 was submitted for laboratory analysis of FOC and pH.



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 25, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 57.205 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.24					● 20 ▲ 100	40 200	60 300	80 400				
0		Medium brown sand with gravel and cobbles, FILL. Low recovery.			2						SS 1		Protective Casing and Bentonite Seal
1	55.7				4						SS 2		
2		Large boulders, concrete debris, gravel and brick debris, FILL. Very low recovery.			6						SS 3		
3	54.2				8						SS 4		
3	53.7	Light brown/grey SILTY SAND.			10						SS 5		
4		Limestone BEDROCK. Inferred fractures between 4.57 and 6.40 mbgs.		▽	12								51 mm, Schedule 40, PVC Casing, with Sandpack
5					14								
6					16								51 mm, Schedule 40, slot #10, PVC Screen with Sandpack
7					18								
8	49.6				20								
9					22								
10					24								
8		End of borehole at 7.6 mbgs. Well was dry during the July 31, 2013 sampling event.			26								
9					28								
10					30								
11					32								
12					34								
13					36								
14					38								
15					40								
16					42								
					44								
					46								
					48								
					50								
					52								

LABORATORY ANALYSES: MW13-13 SS5 was submitted for laboratory analysis of PHCs, BTEX, VOC, metals, PAH, EC/SAR. A composite of SS4 and SS5 was submitted for laboratory analysis of FOC. SS1 was submitted for laboratory analysis of FOC.

▽ Groundwater Level



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 25, 2013 WATER LEVEL April 24, 2014 TPC ELEV. 56.918 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.07					● 20 ▲ 100	40 200	60 300	80 400				
0-1		Light brown medium sand with gravel and boulders, FILL Low recovery.			2	▲				SS 1		Protective Casing and Bentonite Seal	
1	55.5				4					SS 2			
2		Light brown SILTY SAND. Some silty clay above bedrock. Wet.			6	▲				SS 3			
3		- saturated from 2.29m to 3.048m.			8	▲				SS 4			
4	53.4				10	▲				SS 5			
4-8		Limestone BEDROCK. Inferred fractures between 4.88 and 6.71 mbgs.		▽	12							51 mm, Schedule 40, PVC Casing, with Sandpack 51 mm, Schedule 40, slot #10, PVC Screen with Sandpack	
5					14								
6					16								
7					18								
8	49.4				20								
9					22								
10					24								
11					26								
12					28								
13					30								
14					32								
15					34								
16					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

LABORATORY ANALYSES: MW13-14 SS3 was submitted for laboratory analysis of PHCs, BTEX, VOCs, metals, PAH, EC/SAR, PCBs. A composite of SS4 and SS5 was submitted for laboratory analysis of FOC. SS1 was submitted for laboratory analysis of FOC.

▽ Groundwater Level

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING March 4, 2014 WATER LEVEL April 24, 2014 TPC ELEV. 57.934 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.99					● 20	▲ 100	40	60	80			
0.5	57.4	Brown, SAND, silt, gravel, large rocks, FILL, dry.			2							SS 1	Protective Casing and Bentonite Seal, with packer installed at 7.62 metres below grade.
1.0	56.6	Large boulder.			4								
2.0	55.4	Dark brown, SILTY SAND, some rocks, FILL, moist. Direct push refusal, switch to air hammer until bedrock.			6							SS 2	
3.0		Dark brown, SILTY SAND, FILL, moist.			10							GS 3	
4.0	53.7	Light brown SANDY SILT, with gravel, moist, some shale fragments.			12							GS 4	
5.0	52.5				16								
6.0		Shale bedrock. Large void encountered at approximately 13.4 m to 14.3 m.			18								Open hole in shale bedrock.
7.0					20								
8.0					22								
9.0					24								
10.0					26								
11.0					28								
12.0					30								
13.0					32								
14.0					34								
14.3	43.5				46								
15.0					48								
16.0					50								
16.0					52								

Groundwater Level



MONITORING WELL RECORD

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING March 5, 2014 WATER LEVEL April 24, 2014 TPC ELEV. 57.901 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	58.01					● 20 ▲ 100	40 200	60 300	80 400				
1	56.5	Dark brown, SANDY SILT, with large rocks, some gravel, red staining, FILL, dry.	[Cross-hatch pattern]		2	▲					SS 1		Protective Casing and Bentonite Seal
2	55.0	Dark brown, SANDY SILT, with some medium rocks, FILL, moist.	[Cross-hatch pattern]		8	▲					SS 2		
3	54.2	Dark brown, SANDY SILT, large rocks, some black staining, FILL, moist.	[Cross-hatch pattern]		12	▲					SS 3		
4		Dark brown, SANDY SILT, with coarse grey gravel, some rocks, FILL, moist. Direct push refusal on inferred bedrock.	[Cross-hatch pattern]		14	▲					SS 4		
5	53.0	Dark brown, SANDY SILT, with coarse grey gravel, some rocks, FILL, moist. Direct push refusal on inferred bedrock.	[Cross-hatch pattern]		16	▲					SS 5		
6		Shale bedrock.	[Brick pattern]		18								51 mm, Schedule 40, PVC Casing, with Sandpack
7			[Brick pattern]		20								
8			[Brick pattern]		22								
9			[Brick pattern]	▽	24								
10			[Brick pattern]		26								
11			[Brick pattern]		28								
12			[Brick pattern]		30								
13			[Brick pattern]		32								
14			[Brick pattern]		34								
15			[Brick pattern]		36								
16	42.3	End of borehole at 15.7 mbgs	[Brick pattern]		52								51 mm, Schedule 40, slot #10, PVC Screen with Sandpack

▽ Groundwater Level

A-

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING March 6, 2014 WATER LEVEL April 24, 2014 TPC ELEV. 57.802 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			WELL CONSTRUCTION
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.91					● 20	▲ 100	40	60	80			
1	56.4	Grey, SILTY SAND, grey gravel and large rocks, FILL, dry.			2								Protective Casing and Bentonite Seal
2	55.8	Large boulder.			4								
3	54.1	Dark brown, SILTY SAND, some rocks, FILL, dry. Direct push refusal on inferred bedrock.			6								
4		Shale bedrock.			8								
5					10								51 mm, Schedule 40, PVC Casing, with Sandpack
6					12								
7					14								
8					16								
9					18								
10					20								
11					22								
12					24								
13	44.9	End of borehole at 13 mbgs.		▽	26								
14					28								
15					30								
16					32								
					34								
					36								
					38								
					40								
					42								
					44								
					46								
					48								
					50								
					52								

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14

▽ Groundwater Level

A-



BOREHOLE RECORD

BH14-4

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING March 5, 2014 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES				
						● %LEL	▲ ppmv			TYPE	NUMBER	N-VALUE		
0		Dark brown, SILTY SAND, with large rocks, FILL, dry.	[Cross-hatched pattern]		2	▲					SS	1		
1					4									
2		Dark brown, SILTY SAND, black staining and coal fragments, FILL, dry. Direct push refusal on inferred boulders/bedrock.	[Cross-hatched pattern]		6	▲					SS	2		
3					8									
3		End of borehole at 2.59 mbgs.			10									
4					12									
5					14									
6					16									
7					18									
8					20									
9					22									
10					24									
11					26									
12					28									
13					30									
14					32									
15					34									
16		36												
		38												
		40												
		42												
		44												
		46												
		48												
		50												
		52												

LABORATORY ANALYSES: BH14-4 SS2 was submitted for laboratory analysis of bulk and leachable PAHs.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING March 5, 2014 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES					
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE					
0		Brown, SILTY SAND, gravel, some rocks, FILL, dry.			2	▲					SS	1			
1					4										
2		Brown, SILTY SAND, gravel, FILL, dry. Direct push refusal on inferred boulder/bedrock.			6	▲					SS	2			
3		End of borehole at 2.13 mbgs.			8										
4					10										
5					12										
6					14										
7					16										
8					18										
9					20										
10					22										
11					24										
12					26										
13					28										
14					30										
15					32										
16					34										

LABORATORY ANALYSES: BH14-5 SS1 was submitted for laboratory analysis of bulk and leachable PAHs.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING March 5, 2014 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES							
						● %LEL	▲ ppmv			TYPE	NUMBER	N-VALUE					
0		Dark brown, SILTY SAND, with gravel, FILL, dry.	[Cross-hatch pattern]			● 20	▲ 100	40	200	60	300	80	400				
1		Light brown, fine SAND, with silt, FILL, dry. Direct push refusal on inferred boulder/bedrock. - wet.	[Cross-hatch pattern]		▲ 2										SS	1	
2			[Cross-hatch pattern]		▲ 7										SS	2	
3		End of borehole at 2.74 mbgs.			10												
4					12												
5					14												
6					16												
7					18												
8					20												
9					22												
10					24												
11					26												
12					28												
13					30												
14					32												
15					34												
16					36												
					38												
					40												
					42												
					44												
					46												
					48												
					50												
					52												

LABORATORY ANALYSES: BH14-6 SS1 was submitted for laboratory analysis of bulk and leachable PAHs.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 4/28/14

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	58.07	Brown sand with coarse gravel and concrete debris, FILL.			0	● 20	▲ 100	40	60	80			
					2	▲							SA 1
1		Silt with fine SAND, trace clay.			4								
					6	▲							SA 2
2	56.1	Inferred BEDROCK at 2.5 mbgs.			8								
	55.6				10	▲							SA 3
3					12								
4					14								
5					16								
6					18								
7					20								
8					22								
9					24								
10					26								
11					28								
					30								
					32								
					34								
					36								

LABORATORY ANALYSES: TP2-1 and TP2-5 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES														
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER	N-VALUE						
0	58.35	Brown sand with gravel and concrete debris, some cobbles, FILL.			0	●	▲																	
					2		▲																SA 1	
1					4		▲																SA 2	
2	56.3				6		▲																SA 3	
		Inferred BEDROCK at 2.0 mbgs.			8																	SA 4		
					10																			
					12																			
					14																			
					16																			
					18																			
					20																			
					22																			
					24																			
					26																			
					28																			
		30																						
		32																						
		34																						
		36																						

LABORATORY ANALYSES: TP3-1 and TP3-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES													
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER	N-VALUE					
0	58.10	Brown sand with gravel and some cobbles, FILL. Some wood debris, concrete debris, FILL. Some dark staining with heavy creosote odour. -Light creosote odour.			0																		
							2															SA 1	
							4																SA 2
							6																SA 3
	56.1						8																SA 4
	55.0						10																SA 5
		Inferred BEDROCK at 3.0 mbgs.			12																	SA 6	
							14																
							16																
							18																
							20																
							22																
							24																
							26																
							28																
							30																
							32																
					34																		
					36																		

LABORATORY ANALYSES: TP4-1 and TP4-5 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES											
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER	N-VALUE			
0	57.22	Brown sand with gravel, some cobbles, FILL.			0																
					2	▲														SA 1	
1					4	▲														SA 2	
					6	▲														SA 3	
2	55.2				Light brown SANDY SILT, trace clay. Damp.			8	▲												SA 4
								10	▲												
3	54.2	12	▲																	SA 6	
4		Inferred BEDROCK at 3.0 mbgs.			14																
					16																
5					18																
					20																
6					22																
					24																
7					26																
					28																
8					30																
					32																
9					34																
10		36																			

LABORATORY ANALYSES: TP5-1 and TP5-6 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE			
0	57.06	Brown loam, some gravel, TOPSOIL.			0	● 20	▲ 100	40	60	80			
1	56.1	Light brown SILTY SAND. Damp.			2		▲					SA 1	
2	55.1	Moist, trace clay.			4		▲					SA 2	
		Inferred BEDROCK at 2.5 mbgs.			6		▲					SA 3	
					8		▲					SA 4	
					10								
					12								
					14								
					16								
					18								
					20								
					22								
					24								
					26								
					28								
					30								
					32								
					34								
					36								

LABORATORY ANALYSES: TP7-1 and TP7-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES					
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400
0	57.88	Large boulders, cobbles, gravel, and limestone slabs, FILL.			▲									SA 1	
1	56.9	Medium grey sand with gravel. Cobbles, metal, wood and glass debris present, FILL.				▲									SA 2
	56.4	Grey/brown silty sand with gravel and trace clay. Metal, wood and glass debris present, FILL.				▲									SA 3
2		Grey/brown silty sand with gravel and trace clay. Metal, wood and glass debris present, FILL.				▲									SA 4
	55.4	Inferred BEDROCK at 2.5 mbgs				▲									SA 5
3					10										
4					12										
5					14										
6					16										
7					18										
8					20										
9					22										
10					24										
11					26										
					28										
					30										
					32										
					34										
					36										

LABORATORY ANALYSES: TP8-1 and TP8-4 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES						
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE						
0	58.63					● 20	▲ 100	40	200	60	300	80	400			
		Brown sand with gravel with some cobbles, FILL.				▲								SA 1		
1	57.1				2	▲								SA 2		
		SILTY SAND with trace clay. Wet.			4	▲								SA 3		
2	56.6				6	▲								SA 4		
		Inferred BEDROCK at 2.0 mbgs.			8											
3					10											
4					12											
5					14											
6					16											
7					18											
8					20											
9					22											
10					24											
					26											
					28											
					30											
					32											
					34											
11					36											
		LABORATORY ANALYSES: TP9-1 and TP9-4 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.														

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. 57.874 CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES		
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE		
0		Coarse gravel, concrete and boulders, FILL.				● 20 ▲ 100	40 200	60 300	80 400			
0.5												SA 1
1		Brown sand with gravel, FILL.										SA 2
1.5												SA 3
2		Some silty sand and trace clay above bedrock. -0.2m grey/black seam of sandy fill										SA 4
2.5											SA 5	
3		Inferred BEDROCK at 2.5 mbgs.										
4												
5												
6												
7												
8												
9												
10												
11												

LABORATORY ANALYSES: TP10-1 and TP10-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS					SAMPLES						
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER
0	58.00					● 20	▲ 100	40	60	80							
		Gravel with some brown sand, boulders and cobbles, FILL.			2		▲										SA 1
1	57.0	Silty sand with silty clay. Red brick debris. Some pieces of broken ceramic plates and tiles, FILL. -Some silty sand.			4		▲										SA 2
2	56.0				6		▲										
		Inferred BEDROCK at 2.0 mbgs.			8												SA 4
					10												
					12												
					14												
					16												
					18												
					20												
					22												
					24												
					26												
					28												
					30												
					32												
					34												
					36												

LABORATORY ANALYSES: TP11-1 and TP11-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13



TEST PIT RECORD

TP12

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 23, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS					SAMPLES				
						● %LEL	▲ ppmv						TYPE	NUMBER	N-VALUE
0	57.04					● 20	▲ 100	40	60	80					
		Brown sand with gravel and boulders, FILL.											SA	1	
1	56.0				2								SA	2	
	55.5	Red brick debris, and areas of inferred coal debris. Patches of black debris, FILL.			4								SA	3	
2	55.0	Brown sand with gravel. Areas with black/grey sand, brick debris, metal cables, metal and wood debris, FILL.			6								SA	4	
		Inferred BEDROCK at 2.0 mbgs.			8										
3					10										
4					12										
5					14										
6					16										
7					18										
8					20										
9					22										
10					24										
11					26										
					28										
					30										
					32										
					34										
					36										

LABORATORY ANALYSES: TP12-1 and TP12-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES						
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE		
0	56.79					● 20	▲ 100	40	200	60	300	80	400			
0		Brown sand with gravel, some cobbles, FILL.				▲									SA 1	
1					2	▲									SA 2	
1	55.3				4	▲									SA 3	
2	54.8	Some metal and wood debris. Grey road base material, possible ash material, FILL.			6	▲									SA 4	
2		Medium brown sand with gravel, FILL.			8	▲									SA 5	
3					10	▲									SA 6	
3	53.3				12	▲									SA 7	
4	52.8	Light brown SILTY SAND.			14	▲									SA 8	
4		Inferred BEDROCK at 4.0 mbgs.			16											
5					18											
6					20											
7					22											
8					24											
8					26											
9					28											
9					30											
10					32											
10					34											
11					36											

LABORATORY ANALYSES: TP13-1 and TP13-4 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES				
						● %LEL	▲ ppmv			TYPE	NUMBER	N-VALUE		
0	57.93	Concrete blocks, cobbles, boulders, with some brown sand and gravel. Trace silty clay, FILL. Rocky material causing caving, FILL.			0	● 20	▲ 100	40	60	80				
					2	▲							SA 1	
1					4	▲							SA 2	
2	55.9				6								SA 3	
	55.4				8								SA 4	
3		End of testpit at 2.5 mbgs due to caving issues.			10									
4					12									
5					14									
6					16									
7					18									
8					20									
9					22									
10					24									
					26									
					28									
					30									
11					32									
					34									
		36												

LABORATORY ANALYSES: TP14-1 was submitted for laboratory analysis of PHCs, VOCs, PAH, and metals. No other samples were submitted due to low soil quantity and many boulders.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES								
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER	N-VALUE
0	58.18	Brown sand with gravel. Some clay, FILL.	[Cross-hatch pattern]		0													
1	57.2	Some black staining in areas. Red brick debris, FILL.	[Cross-hatch pattern]		2	▲												SA 1
					4	▲												SA 2
2	56.2	Light brown SILT with fine sand.	[Vertical lines pattern]		6	▲												SA 3
	55.7				8	▲												SA 4
3		Inferred BEDROCK at 2.5 mbgs.			10													SA 5
4					12													
5					14													
6					16													
7					18													
8					20													
9					22													
10					24													
					26													
					28													
					30													
					32													
					34													
11					36													

LABORATORY ANALYSES: TP15-1 and TP15-2 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES											
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER	N-VALUE			
0	58.08	Brown sand with gravel. Trace clay. Some red brick debris, concrete, and boulders, FILL.			0																
					2	▲														SA 1	
1					4	▲														SA 2	
					6	▲														SA 3	
2	56.1				Grey/blue silty clay with debris, bricks and gravel, FILL.			8	▲												SA 4
								10	▲												
3	55.1	12	▲																	SA 6	
		Inferred BEDROCK at 3.0 mbgs.			14																
					16																
					18																
					20																
					22																
					24																
					26																
					28																
					30																
					32																
		34																			
		36																			

LABORATORY ANALYSES: TP16-1 and TP16-5 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13



TEST PIT RECORD

TP17

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES				
						● %LEL	▲ ppmv	TYPE	NUMBER	N-VALUE				
0	57.88	Coarse gravel with boulders and cobbles, low soil/sand content, FILL.			0	● 20	▲ 100	40	60	80				
					2	▲							SA 1	
1	56.4	Light brown SILT with fine sand.			4	▲						SA 2		
					6	▲							SA 3	
2	55.4				8	▲							SA 4	
3		Inferred BEDROCK at 2.5 mbgs.			10									
					12									
4					14									
					16									
5					18									
					20									
6					22									
					24									
7					26									
					28									
8		30												
		32												
9		34												
		36												

LABORATORY ANALYSES: TP17-1 and TP17-4 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES							
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER
0	57.17					● 20	▲ 100	40	60	80							
		Fine brown sand with some gravel, trace silt, FILL.				▲											SA 1
1	56.2				2	▲											SA 2
		Red brick debris with concrete. Old electrical wires, FILL.			4	▲											SA 3
	55.7																
2	55.2	Concrete debris, FILL.			6	▲											SA 4
		Light brown silt with fine sand. Traces of red brick debris, FILL.			8	▲											SA 5
3	54.2				10	▲											SA 6
		Inferred BEDROCK at 3.0 mbgs.			12												
4					14												
5					16												
6					18												
7					20												
8					22												
9					24												
10					26												
11					28												
					30												
					32												
					34												
					36												

LABORATORY ANALYSES: TP18-1 and 18-6 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES					
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE	
0	57.41	Concrete debris, boulders, red bricks. Some metal debris. FILL.	[Cross-hatch pattern]		0	● 20	▲ 100	40	60	80					
1	56.4	Debris and brick. light brown silty sand with grey/black staining in areas, FILL. PHC/creosote odour.	[Cross-hatch pattern]		2	▲							SA 1		
	55.9				4	▲									SA 2
2	55.4	Light brown SILTY SAND. Staining in areas.	[Vertical lines pattern]		6	▲							SA 3		
		Inferred BEDROCK at 2.0 mbgs.			8								SA 4		
					10										
					12										
					14										
					16										
					18										
					20										
					22										
					24										
					26										
		28													
		30													
		32													
		34													
		36													

LABORATORY ANALYSES: TP19-1 and 19-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES						
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE		
0	57.94					● 20	▲ 100	40	200	60	300	80	400			
	57.4	Concrete boulders, medium brown sand and gravel, FILL.			▲									SA	1	
	56.9	Fine grey sand and some concrete debris, FILL.			▲									SA	2	
1		Medium brown sand with red brick debris. Some inferred coal debris, FILL.			▲									SA	3	
	55.9				▲									SA	4	
2	55.4	Light brown silty sand with debris. Trace clay. Pieces of ceramic plates found, FILL.			▲									SA	5	
3		Inferred BEDROCK at 2.5 mbgs.														
4																
5																
6																
7																
8																
9																
10																
11																

LABORATORY ANALYSES: TP20-1 and 20-4 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES						
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE		
0	57.97					● 20	▲ 100	40	200	60	300	80	400			
	57.5	Concrete boulders, coarse gravel, red bricks, and medium brown sand with gravel, FILL.	[Cross-hatch pattern]												SA 1	
1	57.0	Medium brown sand with gravel, FILL. Fine grey sand layer with staining in areas.	[Cross-hatch pattern]		2										SA 2	
	56.5	Medium black SAND. Staining heavy in areas with creosote odour. Creosote debris found, possible building materials.	[Cross-hatch pattern]		4										SA 3	
2	56.0	Concrete and brick debris with some sand, FILL.	[Cross-hatch pattern]		6	▲									SA 4	
	55.5	Light brown SANDY SILT.	[Vertical lines pattern]		8	▲									SA 5	
3		Inferred BEDROCK at 2.5 mbgs.			10											
4					12											
5					14											
6					16											
7					18											
8					20											
9					22											
10					24											
					26											
					28											
					30											
					32											
					34											
11					36											

LABORATORY ANALYSES: TP21-1 and 21-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS					SAMPLES						
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER
0	58.05					● 20	▲ 100	40	60	80							
		Cobbles, concrete debris, sand and gravel, FILL.					▲										SA 1
1	57.0				2		▲										SA 2
		Metal and wood debris, FILL.					▲										SA 3
	56.5				4		▲										SA 4
	56.0	Light brown SILTY SAND with trace clay.			6		▲										
2		Inferred BEDROCK at 2.0 mbgs.			8												
3					10												
4					12												
5					14												
6					16												
7					18												
8					20												
9					22												
10					24												
11					26												
					28												
					30												
					32												
					34												
					36												

LABORATORY ANALYSES: TP23-1 and 23-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES					
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE	
0	57.56	Brown medium sand with gravel and cobbles. Some red brick debris, metal and wood debris, FILL.			0	●	▲								
1					2									SA 1	
2	55.6				4									SA 2	
3	54.6				6									SA 3	
4					8									SA 4	
5					10									SA 5	
6		Inferred BEDROCK at 3.0 mbgs.			10										
7					12										
8					14										
9					16										
10					18										
11					20										
					22										
					24										
					26										
					28										
					30										
		32													
		34													
		36													

LABORATORY ANALYSES: TP24-1 and 24-6 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES						
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE		
0	57.58					● 20	▲ 100	40	200	60	300	80	400			
		Medium brown sand with gravel, FILL.				▲									SA 1	
1	56.6				2		▲								SA 2	
		Electrical wires and concrete conduit debris, FILL.			4		▲								SA 3	
	56.1															
		Medium brown sand with gravel, FILL.			6		▲								SA 4	
2	55.6															
		Light brown/grey fine SAND with silt. Trace clay.			8		▲								SA 5	
	55.1															
3		Inferred BEDROCK at 2.5 mbgs.			10											
4					12											
5					14											
6					16											
7					18											
8					20											
9					22											
10					24											
11					26											
					28											
					30											
					32											
					34											
					36											

LABORATORY ANALYSES: TP25-1 and 25-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES													
						● %LEL	▲ ppmv	20	40	60	80	100	200	300	400	TYPE	NUMBER	N-VALUE					
0	57.99	Coarse grey/brown sand with gravel. Some metal debris, FILL.			0	●	▲																
					2	▲																	SA 1
1	56.5				4	▲																	SA 2
					6	▲																	
2	56.0	Light brown medium SAND.			6	▲															SA 4		
		Inferred BEDROCK at 2.0 mbgs.			8																		
3					10																		
4					12																		
5					14																		
6					16																		
7					18																		
8					20																		
9					22																		
10					24																		
11					26																		

LABORATORY ANALYSES: TP26-1 and 26-2 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES			
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER
0	57.40	Medium brown sand, some gravel, concrete debris and cobble, FILL. Plastic electrical conduits near surface.			0	● 20	▲ 100	40	60	80			
1					2		▲					SA	1
1					4		▲					SA	2
1	55.9	Light brown SILTY SAND.			4		▲					SA	3
2					6		▲					SA	4
2	54.9				8		▲					SA	5
3		Inferred BEDROCK at 2.5 mbgs.			10								
4					12								
5					14								
6					16								
7					18								
8					20								
9					22								
10					24								
11					26								
					28								
					30								
					32								
					34								
					36								

LABORATORY ANALYSES: TP27-1 and 27-5 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES					
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE	
0	57.38	Coarse brown sand with some gravel, FILL. Electrical wire debris.			0	●	▲								
0.5					1	▲							SA 1		
1					2	▲							SA 2		
1.5	55.9				4	▲							SA 3		
2					6	▲							SA 4		
2.5		Light brown fine SILTY SAND with trace clay.			8	▲								SA 5	
3	54.9				10										
3.5					12										
4					14										
4.5					16										
5					18										
5.5					20										
6					22										
6.5					24										
7					26										
7.5		28													
8		30													
8.5		32													
9		34													
9.5		36													
10															
10.5															
11															

LABORATORY ANALYSES: TP28-1 and 28-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS				SAMPLES				
						● %LEL	▲ ppmv	20	40	60	80	TYPE	NUMBER	N-VALUE
0	58.05	Coarse brown sand with coarse gravel. Some cobbles, concrete and debris, FILL.			0	●	▲							
1					2	▲							SA 1	
2	56.6				4	▲							SA 2	
3					6	▲							SA 3	
4	55.6				8	▲							SA 4	
5		Inferred BEDROCK at 2.5 mbgs.			10									
6					12									
7					14									
8					16									
9					18									
10					20									
11					22									
					24									
					26									
					28									
					30									

LABORATORY ANALYSES: TP29-1 and 29-4 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

TEST PIT RECORD

TP30

CLIENT City of Ottawa PROJECT No. 122510670 ORIGINATED BY J.U.
 LOCATION Boteler Street DATUM NAD 83 COMPILED BY B.C.
 DATES: BORING July 24, 2013 WATER LEVEL _____ TPC ELEV. _____ CHECKED BY J.P.-D.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS					SAMPLES			
						● %LEL					▲ ppmv	TYPE	NUMBER	N-VALUE
						20	40	60	80					
						100	200	300	400					
0	58.44					▲						SA 1		
		Brown coarse sand with concrete boulders, some metal and wood debris, FILL.	[Cross-hatch pattern]		2	▲						SA 2		
1					4	▲						SA 3		
	56.9													
		Light brown SILTY SAND.	[Vertical lines pattern]		6	▲						SA 4		
2	56.4													
		Inferred BEDROCK at 2.0 mbgs.			8									
3					10									
4					12									
5					14									
6					16									
7					18									
8					20									
9					22									
10					24									
11					26									
					28									
					30									
					32									
					34									
					36									

LABORATORY ANALYSES: TP30-1 and 30-3 were submitted for laboratory analysis of PHCs, VOCs, PAH, and metals.

STAN-MW 122510670 - BOTELER ST - PARCELS 1&2.GPJ SMART.GDT 9/12/13

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix F
SOIL REMEDIATION
June 27, 2014

Appendix F
SOIL REMEDIATION

Appendix F REMEDIATION

Following the completion of the first round of sampling of the Phase Two ESA, Stantec Consulting Ltd. (Stantec) was retained by the City of Ottawa (the City) to complete soil remediation at 187 Boteler Street in Ottawa, Ontario (the "Site"). The soil remediation was developed to address specific contaminants of concern (COCs) related to the historical land-use at the Site. The ultimate objective of the remedial approach for the Site is the filing and acknowledgement by the Ontario Ministry of the Environment (MOE) of Record(s) of Site Condition under Ontario Regulation (O.Reg.) 153/04.

The remediation for the Site included a remedial excavation of soil impacted with mercury. The remedial excavation was completed on April 9, 2014.

The remedial objective was to remove the highest concentration of mercury in soil, which was an order of magnitude greater than the next highest concentration (a "hot spot"). The excavation limits were determined by the standard practice of half the distance to the closest clean sample as a radius around the impacted soil location.

1.0 REMEDIAL ACTIONS

The remedial excavation activities were completed on April 9, 2014.

The completed remedial excavation occurred along the south property line just west of the centre of the Site associated with the former residential houses on the Site, as shown on Figure No. F1 within this appendix.

1.1 SOIL SAMPLING

Stantec personnel were present to observe and direct the excavation, and to collect environmental verification soil samples. During the remedial excavation activities, observations were made of soil type, grain size, moisture, and visual and/or olfactory evidence of environmental impacts.

Generally, soil samples collected during the verification program associated with the remedial excavation were placed into laboratory-supplied glass sample jars.

1.2 FIELD SCREENING ASSESSMENT

Based on the contaminant of concern (mercury), field screening of headspace combustible gas concentrations was not completed.

1.3 ANALYTICAL TESTING

Soil samples were collected from the walls and floor of the excavation at half the distance to the closest clean sample location (7.5 m) in a radius around the location of the mercury "hot spot". The soil samples were submitted to Paracel Laboratories Ltd. (Paracel) for laboratory analysis of mercury.

All laboratory analyses completed by Paracel were in accordance with the MOE document Protocol for *Analytical Methods Used in the Assessment of Properties under Environmental Protection Act*, March 9, 2004 amended as of July 1, 2011. Paracel is accredited in accordance with the International Standard *ISO/IEC 17025 – General Requirement for the Competence of Testing and Calibration Laboratories*. In addition, Paracel is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for the analysis of the parameters included in this report.

The excavated soil was removed from the Site and disposed at the BFI landfill in Navan, Ontario.

1.3.1 Analytical Protocol/Certificates of Analysis

All soil samples collected as part of the remedial verification program were submitted to Paracel for laboratory analysis of COC. All laboratory results were summarized within laboratory prepared Certificates of Analysis and provided to Stantec for review.

Following review, Stantec confirms that:

- All received Certificates of Analysis comply with Section 47(3) of O.Reg. 153/04. Specifically, each Certificate of Analysis includes the following information:
 - a) the laboratory name, address, contact and phone number;
 - b) client name, client contact, address and phone number;
 - c) sample identification number for tracking purposes;
 - d) sample type and location;
 - e) sampling date;
 - f) date the sample was received;
 - g) date the sample was analyzed;
 - h) method identification and method reference as specified in the Analytical Protocol;
 - i) chemical parameter measured;
 - j) reporting limits, including adjustment for sample size, moisture content or dilution factor;
 - k) method specific quality assurance and quality control requirements as specified in the Analytical Protocol;

- l) authorization to release the certificate including,
 - i. the name, function, and signature or equivalent of any person authorizing the release, and
 - ii. a statement that the results relate only to the items tested and to all the items tested;
 - m) certification that the data met all analytical requirements in the Analytical Protocol with, if applicable, a detailed description of and rationale for qualification for required exceptions; and
 - n) all information recorded by the laboratory with respect to the condition of samples brought to the laboratory, including information recorded with respect to,
 - i. sample quality, holding time, preservation and storage, and
 - ii. sample containers. O. Reg. 511/09, s. 22.
- A Certificate of Analysis was received by Stantec for each soil sample submitted for laboratory characterization; and
 - Complete copies of all received Certificates of Analysis have been included within this Remediation report appendix.

1.4 REMEDIAL OBJECTIVES

Based on a preliminary review of the soil concentrations from the first round of soil sampling at the Site, it was recommended by the risk assessment team at Stantec, to remove the highest concentration of mercury, which was an order of magnitude greater than the next highest concentration. The highest concentration of mercury was found in test pit 13 (TP13) at the southern property boundary in the central third of the Site at a depth of 2 metres below ground surface (m bgs).

1.5 REMEDIAL EXCAVATION

The remedial excavation limits were determined prior to commencing the excavation activities. The excavation limits were determined by half the distance to the closest non-impacted location (7.5m) as a radius around the location of the "hot spot" (TP13). As the "hot spot" was sampled at approximately 2 m bgs, the excavation was advanced to a depth of 2.5 mbgs to ensure removal of the impacted soil. As the southern property boundary was closer than 7.5 m from the impacted sample location, the south wall of the excavation was along the southern property boundary.

Stantec field personnel were on Site on April 9, 2014, to observe and document soil conditions during the progress the excavation. No screening of samples was conducted as there is no screening method for metal impacts. The location of all soil verification samples submitted for laboratory characterization are shown on **Figures No. F1 and F2**. The limits of excavations are shown on **Figure No. F1**.

During excavation activities approximately 642 metric tonnes of soil were removed from the Site and disposed at the BFI landfill in Navan, Ontario. The excavation was extended to depths ranging from 2.37 m bgs in the southwest corner to 2.7 m bgs at the southeast corner (**Figure No.F2**). No groundwater was encountered during excavation activities.

Backfill material was obtained from a grade difference at the Site, north of the excavation.

1.6 REMEDIAL AMENDMENTS

No remedial amendments were conducted at the Site during excavation activities.

1.7 BASELINE CONDITIONS

During the backfilling activities, each lift of the backfill material obtained from the surface of the Site north of the excavation was sampled and submitted for laboratory analysis of metals and polycyclic aromatic hydrocarbons (PAHs). Concentrations of metals and PAHs were identified above the Ontario Table 3 Site Condition Standards (SCS) in multiple locations across the Site. The backfill samples were collected to characterize the concentrations being placed into the excavation.

1.8 GROUNDWATER VERIFICATION

No groundwater was encountered during the excavation activities. No groundwater was sampled as part of the remedial excavation activities.

1.9 MITIGATIVE CONTROLS

No mitigative controls were implemented during remedial excavation activities.

2.0 FREE FLOWING PRODUCT

No free flowing product was encountered during the remedial excavation.

3.0 CONFIRMATION SAMPLING AND ANALYSIS

3.1 TOTAL ORGANIC VAPOUR CONCENTRATIONS

No combustible vapour concentrations were measured during excavation activities.

3.2 LABORATORY ANALYTICAL RESULTS – SOIL

The laboratory analytical results of the verification soil samples recovered from the final walls and floor of the remedial excavations and submitted for mercury analysis, are presented in **Table F1**. No concentrations of mercury in the confirmatory samples exceeded the Table 3 SCS.

The limits of the excavation are presented on **Figure F1**. The vertical extent of the excavation as well as soil sample locations that met or exceeded the O.Reg. 153/04 (as amended) Table 3 SCS are included on the cross sections (**Figures F3 and F4**). It is important to note that each of the noted Table 3 SCS exceedances were below the highest concentration currently on-Site to be used in a risk assessment.

3.3 LABORATORY ANALYTICAL RESULTS – GROUNDWATER

No groundwater was collected during the remedial excavation activities.

3.4 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

Stantec implemented the following Quality assurance/quality control (QA/QC) program in an effort to obtain data that were considered accurate and representative of actual soil conditions. This program consisted of, but was not limited to:

- Proper sample containment, preservation, handling and transportation;
- Use of an accredited laboratory;
- Use of detection limits appropriate for the required evaluation, where possible; and
- Due regard for necessary health and safety precautions.

For sampling efforts, Stantec completed the following:

- All project staff were properly trained and equipped to undertake the tasks involved in the project;
- Detailed protocols for collecting, documenting, preserving, and transporting samples, as well as conducting field activities, were applied;
- The analytical methods proposed by the laboratory were reviewed prior to the submission of samples to ensure that where possible the RDLs for the requested analyses met, or were lower than, the respective standards to which the analytical data were to be compared;
- One blind field duplicate soil sample for analysis of mercury to evaluate both laboratory precision and the implemented field sampling and handling procedures (as summarized in **Table F1**);
- All field and analytical data were evaluated and interpreted by both the sampling personnel and the project scientific and management teams; and
- Independent checks of all engineering/scientific calculations, figures, and tables were conducted.

3.4.1 Review of Field Program QA/QC

QA/QC procedures were incorporated into both field and laboratory protocols. The following data quality objective (DQO) was established for this investigation:

- Soil analytical data were to be of an acceptable quality to allow for comparison with the SCS referenced under Ontario Regulation 153/04 (O.Reg.153/04).

Each sample was labeled with a unique ID, packed into coolers with ice, and transported to Parcel under chain-of-custody documentation.

Efforts were made during sampling to reduce the potential for contamination so as to obtain representative samples. Accordingly, soil sampling was completed using a new pair of disposable nitrile gloves for each sample. All reusable field equipment was cleaned by washing with phosphate-free detergent, rinsing with methanol, and rinsing with distilled water. Although the soil samples were collected by the use of the excavator bucket, the soil sampled did not come into contact with the excavator bucket.

The field duplicate sample was used to assess the precision of the sampling and analytical procedures. To evaluate the precision associated with sampling and analytical methods, the sample and its duplicate were used to calculate the relative percent difference (RPD). The RPD was calculated using the following formula:

$$RPD = \left| \frac{C_1 - C_2}{(C_1 + C_2)/2} \right| \times 100$$

Where: C_1 is the concentration in the original sample; and
 C_2 is the concentration in the sample replicate.

RPDs of 100% or less are generally considered acceptable for soil analyses. Therefore, for the purposes of this assessment, a screening criterion of 100% was used for the assessment of soil for QA/QC purposes. RPDs were not calculated where the concentration of a parameter in either the regular or duplicate sample was either below or within five times the laboratory reporting limit.

The RPD in soil could not be calculated as the concentrations of mercury in both the regular and duplicate samples were below the laboratory reporting limit.

3.4.2 Deviations from the Sampling and Analysis Plan

No deviations from the sampling plan occurred.

4.0 CONCLUSIONS

The remedial excavation was developed to address a specific mercury exceedance that was recommended to be removed by the risk assessment team after a preliminary review of the soil data from the Phase Two ESA. The remedial excavation was completed on April 9, 2014.

Soil characterization completed during the remedial excavation has confirmed that concentrations of mercury are below available generic Table 3 SCS or less than concentrations present elsewhere on the Site. The values exceeding the Table 3 SCS will be carried forward into the risk assessment for the Site.

**Table F1
Excavation Soil Analytical Results
Boteler Berm
City of Ottawa**

Sample Location			East Wall	North Wall			West Wall	South Wall	Floor			
Sample Date			9-Apr-14	9-Apr-14	9-Apr-14	9-Apr-14	9-Apr-14	9-Apr-14	9-Apr-14	9-Apr-14		9-Apr-14
Sample ID			W1	W2	W3	W4	W5	F1	F2	F4		F3
Sample Depth			1.75-2.4 m	2.0-2.5 m	1.5-2.15 m	1.9-2.3 m	2.5-2.5 m	2.6 m	2.7 m	2.7 m		2.4 m
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	RPD	STANTEC
Laboratory			PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	(%)	PARACEL
Laboratory Work Order		Amended	1415136	1415136	1415136	1415136	1415136	1415136	1415136	1415136		1415136
Laboratory Sample ID		O.Reg	1415136-01	1415136-02	1415136-03	1415136-04	1415136-05	1415136-06	1415136-07	1415136-09		1415136-08
Sample Type	Units	153/04									Field Duplicate	
Metals												
Mercury	µg/g	0.27 ^A 0.27 ^B	0.6 ^{AB}	0.5 ^{AB}	0.1	0.1	<0.1	<0.1	<0.1	<0.1	nc	<0.1

Notes:

Amended Province of Ontario "Soil, Ground Water and Sediment Standards for use under Part XV.I of the O.Reg 153/0- Environmental Protection Act" Amended (April 15, 2011) Site Condition Standards

^A MOE Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use

^B MOE Table 3 - Residential / Parkland / Institutional Property Use - Coarse Textured Soils

6.5^A Concentration exceeds the indicated standard.

15.2 Concentration was detected but did not exceed applicable standards.

< 0.1 The analyte was not detected above the laboratory estimated quantitation limit.

RPD Relative percent difference

nc RPD is not calculated if one or more values is non-detect.



V:\01225\active\122510670_City of Ottawa Boteler Berm\GIS\MXD\REM\122510670_Fig01_SitePlan.mxd
 Revised: 2014-06-27 By: ncaukshank

June 2014
 Project No. 122510670



- Legend**
- ◆ Confirmatory Soil Sample
 - Borehole
 - ⊕ Monitoring Well
 - ⊕ Monitoring Well (Decommissioned)
 - Test Pit
 - ✂ Mercury Excavation Limits
 - Approximate Site Property Boundary

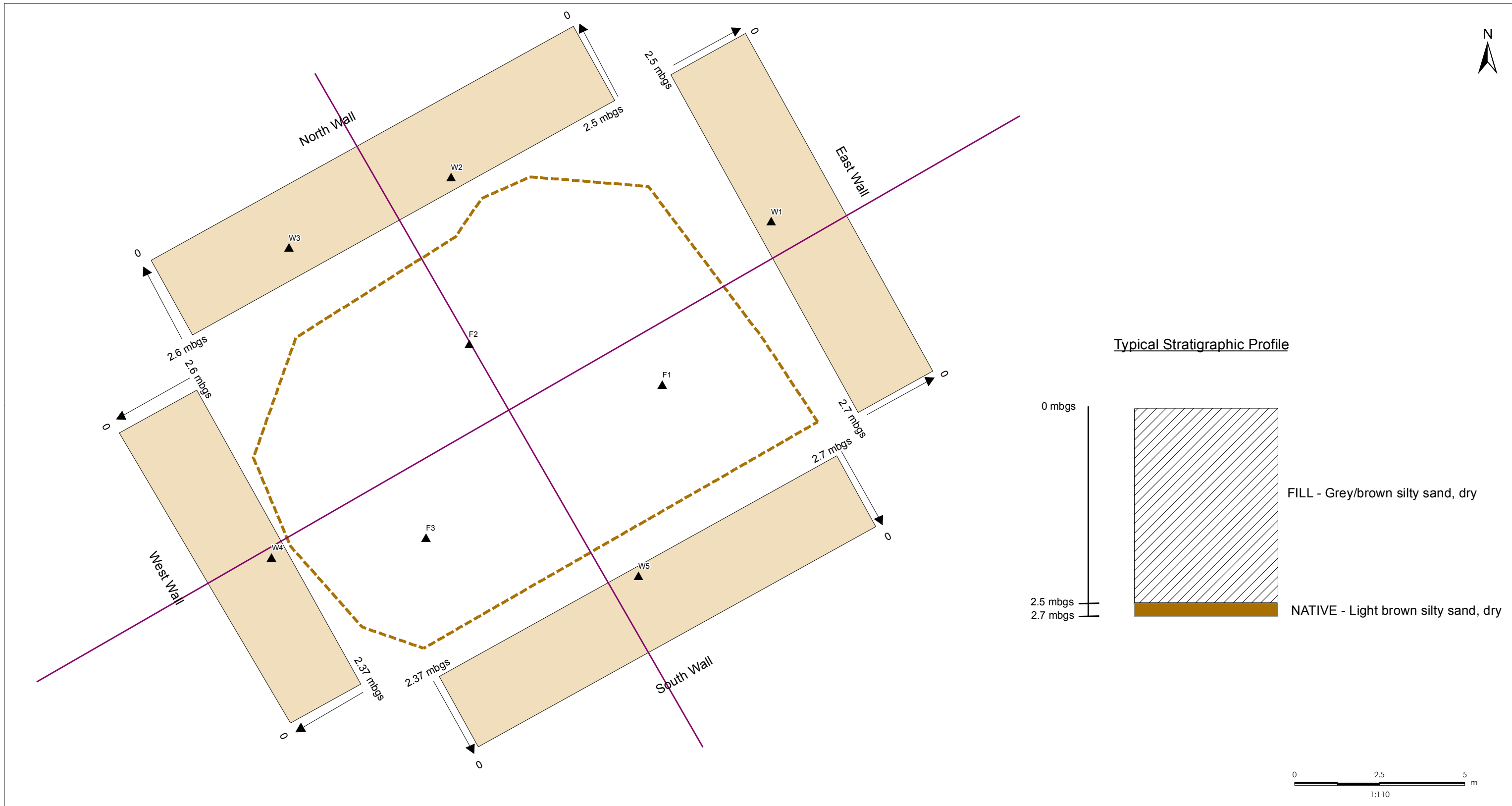
Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.

Client/Project
 City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.
F1
 Title
Site Plan

V:\01225\active\122510670_City of Ottawa Boteler Berm\GIS\MXD\REM\122510670_FigR02_Excavation.mxd
Revised: 2014-06-27 By: nctulshank



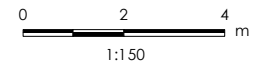
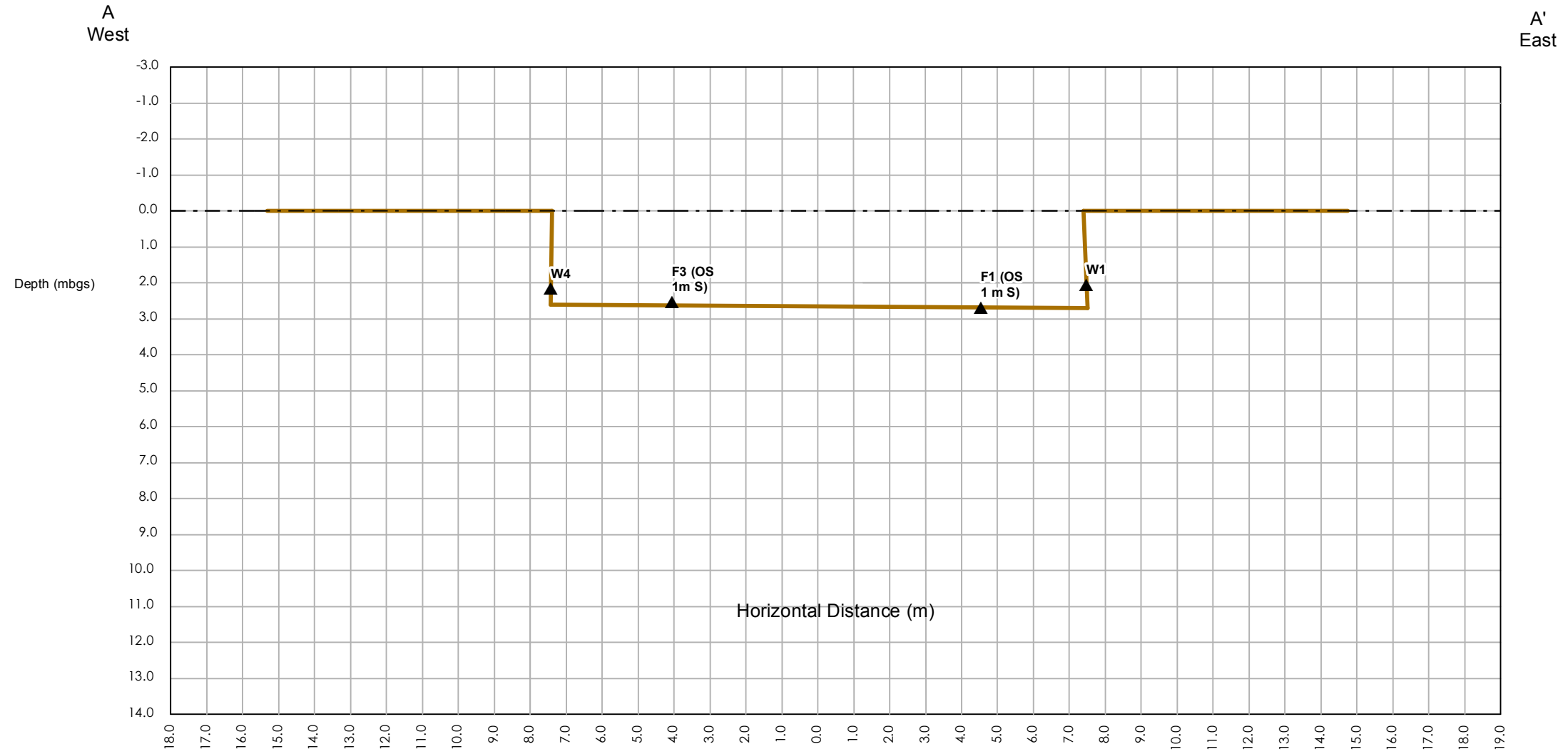
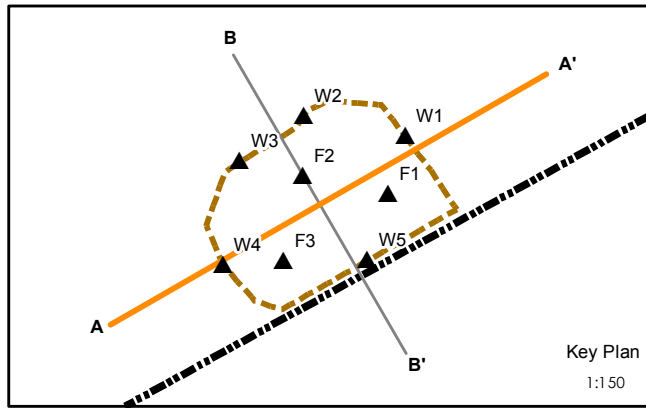
- Legend**
- ▲ Sample Submitted for Laboratory Analysis
 - ▭ Excavation Base
 - ▭ Excavation Wall (Approximated)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N

Client/Project
City of Ottawa
Boteler St, Ottawa, ON
Soil Remediation

Figure No.
F2
Title
Soil Excavation and Sample Locations

V:\0122510670\122510670_City of Ottawa Boteler Berm\GIS\XMD\REM\122510670_FigR03_CrossSection_AA.mxd
Revised: 2014-06-27 By: ncaulkshank



- Legend**
- ▲ Confirmatory Soil Sample Location
 - Base of Excavation
 - Cross-Section Location
 - - - Ground Surface

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N

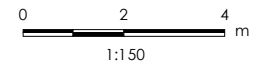
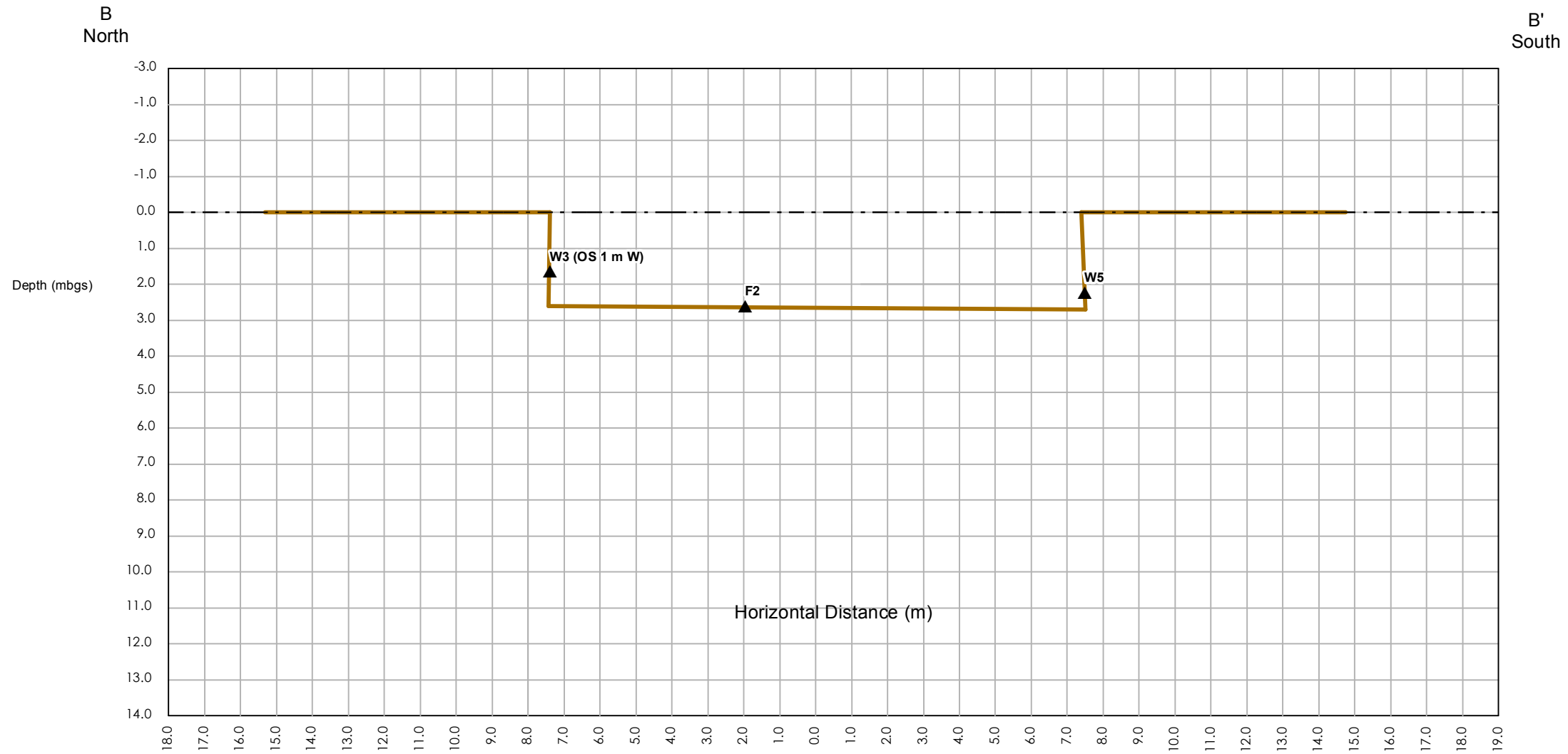
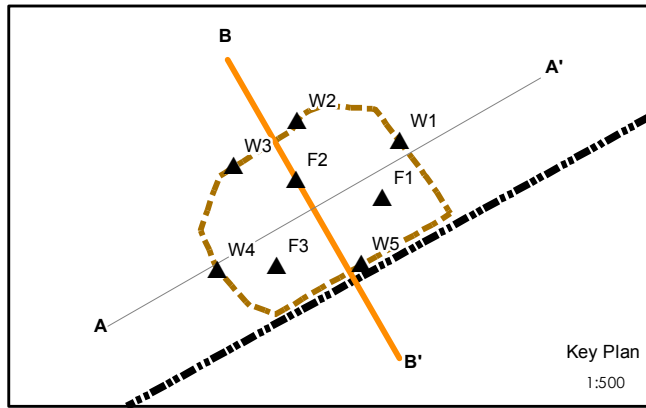
Client/Project
City of Ottawa
Boteler Street, Ottawa, ON
Soil Remediation

Figure No.
F3

Title

**Cross-Section A-A' (West-East)
Looking North**

V:\0122510670\122510670_City of Ottawa Boteler Berm\GIS\MXD\REM\122510670_FigR04_CrossSection_BB.mxd
Revised: 2014-06-27 By: ncaulkshank



- Legend**
- ▲ Confirmatory Soil Sample Location
 - Base of Excavation
 - Cross-Section Location
 - - - Ground Surface

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N

Client/Project
City of Ottawa
Boteler Street, Ottawa, ON
Soil Remediation

Figure No.
F4

Title
**Cross-Section B-B' (North-South)
Looking East**

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.225/ Boteler
Custody: 17318

Report Date: 10-Apr-2014
Order Date: 9-Apr-2014

Order #: 1415136

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

Parcel ID	Client ID
1415136-01	W1
1415136-02	W2
1415136-03	W3
1415136-04	W4
1415136-05	W5
1415136-06	F1
1415136-07	F2
1415136-08	F3
1415136-09	F4

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 10-Apr-2014

Order Date: 9-Apr-2014

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury	EPA 7471B - CVAA, digestion	10-Apr-14	10-Apr-14
Solids, %	Gravimetric, calculation	10-Apr-14	10-Apr-14

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

WWW.PARACELLABS.COM

OTTAWA
300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8

MISSISSAUGA
6645 Kitimat Rd, Unit #27
Mississauga, ON L5N 6J3

NIAGARA FALLS
5415 Morning Glory Cr.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 10-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 9-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

	Client ID:	W1	W2	W3	W4
	Sample Date:	09-Apr-14	09-Apr-14	09-Apr-14	09-Apr-14
	Sample ID:	1415136-01	1415136-02	1415136-03	1415136-04
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

	0.1 % by Wt.	79.8	85.8	83.4	86.0
% Solids					

Metals

	0.1 ug/g dry	0.6	0.5	0.1	0.1
Mercury					

	Client ID:	W5	F1	F2	F3
	Sample Date:	09-Apr-14	09-Apr-14	09-Apr-14	09-Apr-14
	Sample ID:	1415136-05	1415136-06	1415136-07	1415136-08
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

	0.1 % by Wt.	79.5	83.5	80.4	82.0
% Solids					

Metals

	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Mercury					

	Client ID:	F4	-	-	-
	Sample Date:	09-Apr-14	-	-	-
	Sample ID:	1415136-09	-	-	-
	MDL/Units	Soil	-	-	-

Physical Characteristics

	0.1 % by Wt.	79.5	-	-	-
% Solids					

Metals

	0.1 ug/g dry	<0.1	-	-	-
Mercury					

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 10-Apr-2014

Order Date: 9-Apr-2014

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	---------------	------	------------	-----	-----------	-------

Metals

Mercury	ND	0.1	ug/g						
---------	----	-----	------	--	--	--	--	--	--

Certificate of Analysis

Report Date: 10-Apr-2014
Order Date: 9-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	0.615	0.1	ug/g dry	0.600			2.4	35	
Physical Characteristics									
% Solids	83.0	0.1	% by Wt.	79.8			4.0	25	

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 10-Apr-2014
Order Date: 9-Apr-2014

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	---------------	------	------------	-----	-----------	-------

Metals

Mercury	2.16	0.1	ug/g	0.600	104	72-128			
---------	------	-----	------	-------	-----	--------	--	--	--

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 10-Apr-2014

Order Date: 9-Apr-2014

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.

OTTAWA • KINGSTON • NIAGARA • MISSISSAUGA • SARNIA

Page 1 of 1

Client Name: <u>Stantec Consulting Ltd.</u>	Project Reference: <u>122510670 - Bldg</u>	TAT: <input type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Jill Peters-Dechman / Brenda Thom</u>	Quote # <u>City of Ottawa SA # 01910-91843-501</u>	<input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> 1 Day
Address: <u>Suite 400, 1351 Clyde Avenue Ottawa, ON K2C 3G4</u>	PO # <u>122510670, 225</u>	Date Required: <u>RUSH - 24 hr TAT</u>
Telephone: <u>613-722-4420</u>	Email Address: <u>jill.peters-dechman@stantec.com brenda.thom@stantec.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 1 RSC Filing O. Reg. 558/00 PWOO 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

Parcel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		Method	Required Analyses															
Sample ID/Location Name					Date	Time																	
<u>1415136</u>																							
1	<u>W1 BCF186</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>12:45</u>	<u>✓</u>																
2	<u>W2 BCF187</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>12:55</u>	<u>✓</u>																
3	<u>W3 BCF188</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:05</u>	<u>✓</u>																
4	<u>W4 BCF189</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:15</u>	<u>✓</u>																
5	<u>W5 BCF190</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:25</u>	<u>✓</u>																
6	<u>F1 BCF191</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:30</u>	<u>✓</u>																
7	<u>F2 BCF192</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:35</u>	<u>✓</u>																
8	<u>F3 BCF193</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:40</u>	<u>✓</u>																
9	<u>F4 BCF194</u>	<u>Soil</u>	<u>X</u>	<u>1</u>	<u>2014/04/09</u>	<u>13:35</u>	<u>✓</u>																
10																							

Comments: RUSH - 24 hr TAT Method of Delivery: Walk-in

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot:	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Jonathan Urban</u>	Date/Time:	Date/Time: <u>Apr 9/14</u>	Date/Time: <u>Apr 9/14 3:15</u>
Date/Time: <u>2014/04/09 14:47</u>	Temperature: _____ °C	Temperature: <u>8.0 °C</u> <u>2:53p</u>	pH Verified: <input type="checkbox"/> By: <u>N/A</u>

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix G
BACKFILL SOIL SAMPLING
June 27, 2014

Appendix G

BACKFILL SOIL SAMPLING

Appendix G Backfill Soil

Soil used to backfill the remedial excavation completed at the Site in April 2014, was acquired from excess soil on the surface north of the excavation at 187 Boteler Street, Ottawa, Ontario (the "Site"), as shown on **Figure G1**.

The City of Ottawa, current owner, identified excess soil material present on-site due to a grade adjustment that could be used as backfill material. The soil was collected from the ground surface northwest of the excavation. One soil sample was collected from each lift of the backfill material for classification purposes and submitted for laboratory analysis of metals and polycyclic aromatic hydrocarbons (PAHs).

PAHs and metals were previously identified in the soil across the Site during the Phase Two Environmental Site Assessment, completed between April 2013, and April 2014.

The backfill material was formerly part of a soil berm composed of excess soil from the rehabilitation of King Edward Avenue. The berm was a temporary storage solution for the excess soil of unknown quality. The City of Ottawa had approximately half of the berm removed to allow for the proposed construction of a new embassy and residence. Currently the Site is undeveloped.

Approximately 300 m³ of soil was scraped from the surface and deposited into the excavation in 0.3m lifts. The first two lifts were compacted with the excavator bucket, as the excavation was not safe to enter. The subsequent lifts were compacted using a diesel plate packer prior to compaction testing. The soil compaction field report is provided in **Appendix G**.

One soil sample was collected from each lift of soil prior to compaction activities from the bucket of the excavator. A total of nine soil samples were collected and placed into laboratory-supplied glass containers. The glass containers were placed in coolers on ice for transport to Paracel for analysis.

The laboratory results of the backfill material are presented in Table G1. The analytical results of the backfill samples for metals were less than the Ontario Table 3 SCS for residential property use, coarse grained soils, with the exception of lead and mercury in lifts 1 and 4. The concentrations of PAHs in the backfill samples were less than the Ontario Table 3 SCS, with the exception of lifts 1, 4, 5 and 6 which had concentrations exceeding the Table 3 SCS for one or more of the following: acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, biphenyl, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, total methylnaphthalene, naphthalene, phenanthrene, and pyrene. The concentrations exceeding the Table 3 SCS found in the backfill material for anthracene, fluoranthene, the methylnaphthalenes, phenanthrene, and pyrene were greater than the previous maximum concentrations found at the Site, and will be carried forward into the risk assessment for the Site.

Sample Location			Lift 1	Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8	Lift 9
Sample Date			14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14
Sample ID			Lift 1	Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8	Lift 9
Sample Depth			2.74-2.44 m	2.44-2.13 m	2.13-1.83 m	1.83-1.52 m	1.52-1.22 m	1.22-0.91 m	0.91-0.61 m	0.61-0.30 m	0.30-0 m
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL	PARACEL
Laboratory Work Order		Amended	1416085	1416085	1416085	1416085	1416085	1416085	1416085	1416085	1416085
Laboratory Sample ID		O.Reg 153/04	1416085-01	1416085-02	1416085-03	1416085-04	1416085-05	1416085-06	1416085-07	1416085-08	1416085-09
Sample Type	Units										

Metals

Antimony	µg/g	1.3 ^A 7.5 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	µg/g	18 ^{AB}	4.5	2.5	< 1.0	8.2	4.1	2	< 1.0	2	2.1
Barium	µg/g	220 ^A 390 ^B	286 ^A	100	111	284 ^A	128	107	132	113	88.5
Beryllium	µg/g	2.5 ^A 4 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Boron	µg/g	36 ^A 120 ^{s16} ^B	6.1	4.9	4.4	8.6	5.5	4.9	3	2.7	4.5
Boron (Available)	µg/g	n/a ^A 1.5 ^{s16} ^B	0.6	< 0.5	< 0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	µg/g	1.2 ^A 1.2 ^B	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (Total)	µg/g	70 ^A 160 ^B	17.4	5.2	6.5	18.4	20.3	10.5	2.5	2	6
Chromium (Hexavalent)	µg/g	0.66 ^A 8 ^B	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cobalt	µg/g	21 ^A 22 ^B	6.1	2.8	3.2	6.3	7.3	4.3	1.4	1.3	2.7
Copper	µg/g	92 ^A 140 ^B	20.1	7.4	8.2	31.9	24.9	13.4	3.3	2.9	9.5
Lead	µg/g	120 ^{AB}	245 ^{A,B}	18.8	23.6	402 ^{A,B}	58.5	31.9	8.6	6.7	19
Mercury	µg/g	0.27 ^A 0.27 ^B	3.9 ^{A,B}	< 0.1	< 0.1	1.1 ^{A,B}	0.2	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	µg/g	2 ^A 6.9 ^B	1.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Nickel	µg/g	82 ^A 100 ^B	12.6	6.5	7.1	13.3	15	9.1	4.5	3.9	6.4
Selenium	µg/g	1.5 ^A 2.4 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Silver	µg/g	0.5 ^A 20 ^B	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Thallium	µg/g	1 ^{AB}	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Uranium	µg/g	2.5 ^A 23 ^B	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	µg/g	86 ^{AB}	22.5	8	10.2	19.8	30.2	15.6	5.2	4.6	10.1
Zinc	µg/g	290 ^A 340 ^B	57	18.3	20	119	60.6	29.8	5.9	4.3	16.2

Polycyclic Aromatic Hydrocarbons

Acenaphthene	µg/g	0.072 ^A 7.9 ^B	0.04	< 0.02	< 0.02	0.08 ^A	7.79 ^A	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	µg/g	0.093 ^A 0.15 ^B	0.43 ^{A,B}	0.07	0.08	0.13 ^A	3.96 ^{A,B}	0.2 ^{A,B}	0.02	< 0.02	0.08
Anthracene	µg/g	0.16 ^A 0.67 ^B	0.31 ^A	0.06	0.07	< 0.02	40.8 ^{A,B}	0.17 ^A	< 0.02	< 0.02	0.06
Benzo(a)anthracene	µg/g	0.36 ^A 0.5 ^B	0.95 ^{A,B}	0.16	0.14	0.24	31.6 ^{A,B}	0.39 ^A	0.03	< 0.02	0.03
Benzo(a)pyrene	µg/g	0.3 ^A 0.3 ^B	0.85 ^{A,B}	0.12	0.12	0.36 ^{A,B}	22.8 ^{A,B}	0.33 ^{A,B}	0.03	< 0.02	0.13
Benzo(b)fluoranthene	µg/g	0.47 ^A 0.78 ^B	1.25 ^{A,B}	0.18	0.18	0.8 ^{A,B}	30.2 ^{A,B}	0.51 ^A	0.04	< 0.02	0.15
Benzo(g,h,i)perylene	µg/g	0.68 ^A 6.6 ^B	0.17	0.03	0.03	0.08	4.28 ^A	0.08	< 0.02	< 0.02	0.03
Benzo(k)fluoranthene	µg/g	0.48 ^A 0.78 ^B	0.63 ^A	0.11	0.08	0.79 ^{A,B}	15.9 ^{A,B}	0.24	< 0.02	< 0.02	0.09
Biphenyl	µg/g	0.05 ^A 1.1 ^B	< 0.02	< 0.02	< 0.02	< 0.02	1.01 ^{A,B}	< 0.02	< 0.02	< 0.02	< 0.02
Chrysene	µg/g	2.8 ^A 7 ^B	1	0.18	0.17	0.49	30.9 ^{A,B}	0.43	0.03	< 0.02	0.17
Dibenzo(a,h)anthracene	µg/g	0.1 ^A 0.1 ^B	0.06	< 0.02	< 0.02	0.02	1.26 ^{A,B}	< 0.02	< 0.02	< 0.02	< 0.02
Fluoranthene	µg/g	0.56 ^A 0.69 ^B	1.96 ^{A,B}	0.24	0.29	1.23 ^{A,B}	120 ^{A,B}	0.78 ^{A,B}	0.04	< 0.02	0.3
Fluorene	µg/g	0.12 ^A 62 ^B	0.08	< 0.02	< 0.02	0.09	17.1 ^A	0.04	< 0.02	< 0.02	< 0.02
Indeno(1,2,3-cd)pyrene	µg/g	0.23 ^A 0.38 ^B	0.21	0.03	0.03	0.09	4.99 ^{A,B}	0.09	< 0.02	< 0.02	0.03
Methylnaphthalene, 1-	µg/g	^A _{s3} ^B _{s3}	0.03	< 0.02	< 0.02	0.03	3.63 ^{A,B}	< 0.02	< 0.02	< 0.02	< 0.02
Methylnaphthalene, 2-	µg/g	^A _{s3} ^B _{s3}	0.04	< 0.02	< 0.02	0.03	3.85 ^{A,B}	< 0.02	< 0.02	< 0.02	< 0.02
Methylnaphthalene (Total)	µg/g	0.59 ^A 0.99 ^B _{s3} _{s3}	0.07	< 0.04	< 0.04	0.06	7.48 ^{A,B}	< 0.04	< 0.04	< 0.04	< 0.04
Naphthalene	µg/g	0.09 ^A 0.6 ^B	0.05	< 0.01	< 0.01	0.06	4.45 ^{A,B}	0.02	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/g	0.69 ^A 6.2 ^B	0.9 ^A	0.08	0.12	0.9 ^A	152 ^{A,B}	0.37	0.03	< 0.02	0.14
Pyrene	µg/g	1 ^A 78 ^B	1.72 ^A	0.25	0.26	1.03 ^A	95.3 ^{A,B}	0.7	0.04	< 0.02	0.29

Notes:

- Amended Province of Ontario "Soil, Ground Water and Sediment Standards for use under Part XV.I of the
- O.Reg 153/04 Environmental Protection Act" Amended (April 15, 2011) Site Condition Standards
- ^A MOE Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use
- ^B MOE Table 3 - Residential / Parkland / Institutional Property Use - Coarse Textured Soils
- 6.5^A** Concentration exceeds the indicated standard.
- 15.2 Concentration was detected but did not exceed applicable standards.
- < 0.1 The analyte was not detected above the laboratory estimated quantitation limit.



V:\012251\active\122510670_City of Ottawa_Boteler Berm\GIS\MXD\REV\122510670_FigG01_SitePlan.mxd
 Revised: 2014-06-27 By: ncnukshank



Legend

- Approximate Site Property Boundary
- Approximate Source Location of Backfill Material
- Remediation Excavation Limits

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Site Airphoto: City of Ottawa, 2013.
3. Orthoimagery © First Base Solutions, Ottawa Division 2008.

Client/Project

City of Ottawa
 Parts 2, 4, 5, & 6 of Plan 4R-26468
 Part Lot 3 and Part Lot 7
 RCP 611769
 Boteler St, Ottawa, ON

Figure No.

G1

Title

Site Plan & Backfill Source Location



Stantec

Client: City of Ottawa
Project: Boteler Berm Mercury Excavation
Location: 183 Boteler St

Report No.: _____
Project No.: 122510670
Date: April 14, 2013

MATERIAL AND PROCTOR DATA

Material Type Existing Fill Sampled From _____
Proctor Type Standard ASTM D698 Modified ASTM D1557 Date Sampled _____
Maximum Dry Density N/A kg/m³ Opt. Moisture Content _____ (%)
Target Density (from control strip) 2379 kg/m³

DENSITY GAUGE INFORMATION

Make 3411-b Model Taylor Gauge No. 9033 Standard Count 1403, 631 Date Apr. 14

FIELD TEST DATA

Test No.	Test Location	Approx. Elevation	Dry Density	Moisture Content	Percent Proctor	Remarks (pass/fail)
1	Lift 1 - 8 th from finish grade					
2	Lift 2 - 7 th from finish					
3	Lift 3 - 6 th from finish		2306	4.8	97.0	Acceptable
4	Lift 4 - 5 th from finish		2362	5.5	99.3	Pass
5	Lift 5 - 4 th from finish		2334	4.9	98.1	Pass
6	Lift 6 - 3 th from finish		2300	4.1	96.7	-
6	after more compaction		2339	4.4	98.3	Pass
7	Lift 7 - 2 th from finish		2289	5.0	96.2	-
7	Re-compacted		2371	5.6	99.7	Pass
8	Lift 8 - 1 st from finish		2344	5.4	98.5	Pass
9	Final lift		2337	5.0	98.2	Pass
Percentage of Target Density Required					<u>98</u>	%

REMARKS

No compaction inspection on the first 2 lifts. It appeared to be unsafe to enter the excavation. Material was evenly placed in lifts of 300mm and packed down with the shovel
Fill Compaction Meets Specifications Yes No

Client Representative Signature: _____ Stantec Representative Signature: Karl Thom Hours _____
Print: _____ Print: Karl Thom

Note: A compaction test only provides data for the specific test location and to a depth of 6 to 12 inches below the surface at the time of doing the test. Total approval of a fill project requires continuous inspection and a brief report written by a geotechnical engineer.

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670/ Boteler
Custody: 17334

Report Date: 24-Apr-2014
Order Date: 15-Apr-2014

Order #: 1416085

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

Parcel ID	Client ID
1416085-01	Lift 1
1416085-02	Lift 2
1416085-03	Lift 3
1416085-04	Lift 4
1416085-05	Lift 5
1416085-06	Lift 6
1416085-07	Lift 7
1416085-08	Lift 8
1416085-09	Lift 9

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 24-Apr-2014

Order Date: 15-Apr-2014

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	16-Apr-14	16-Apr-14
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	15-Apr-14	16-Apr-14
Mercury	EPA 7471B - CVAA, digestion	16-Apr-14	16-Apr-14
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	16-Apr-14	17-Apr-14
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	15-Apr-14	24-Apr-14
Solids, %	Gravimetric, calculation	16-Apr-14	16-Apr-14

Certificate of Analysis

Report Date: 24-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	Lift 1	Lift 2	Lift 3	Lift 4
Sample Date:	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14
Sample ID:	1416085-01	1416085-02	1416085-03	1416085-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	91.1	87.2	90.9	89.6
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Metals

		Lift 1	Lift 2	Lift 3	Lift 4
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	4.5	2.5	<1.0	8.2
Barium	1.0 ug/g dry	286	100	111	284
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	6.1	4.9	4.4	8.6
Boron, available	0.5 ug/g dry	0.6	<0.5	<0.5	0.9
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	17.4	5.2	6.5	18.4
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	6.1	2.8	3.2	6.3
Copper	1.0 ug/g dry	20.1	7.4	8.2	31.9
Lead	1.0 ug/g dry	245	18.8	23.6	402
Mercury	0.1 ug/g dry	3.9	<0.1	<0.1	1.1
Molybdenum	1.0 ug/g dry	1.3	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	12.6	6.5	7.1	13.3
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	22.5	8.0	10.2	19.8
Zinc	1.0 ug/g dry	57.0	18.3	20.0	119

Semi-Volatiles

		Lift 1	Lift 2	Lift 3	Lift 4
Acenaphthene	0.02 ug/g dry	0.04	<0.02	<0.02	0.08
Acenaphthylene	0.02 ug/g dry	0.43	0.07	0.08	0.13
Anthracene	0.02 ug/g dry	0.31	0.06	0.07	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.95	0.16	0.14	0.24
Benzo [a] pyrene	0.02 ug/g dry	0.85	0.12	0.12	0.36
Benzo [b] fluoranthene	0.02 ug/g dry	1.25	0.18	0.18	0.80
Benzo [g,h,i] perylene	0.02 ug/g dry	0.17	0.03	0.03	0.08
Benzo [k] fluoranthene	0.02 ug/g dry	0.63	0.11	0.08	0.79
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02

Certificate of Analysis

Report Date: 24-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	Lift 1	Lift 2	Lift 3	Lift 4
	Sample Date:	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14
	Sample ID:	1416085-01	1416085-02	1416085-03	1416085-04
	MDL/Units	Soil	Soil	Soil	Soil
Chrysene	0.02 ug/g dry	1.00	0.18	0.17	0.49
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.06	<0.02	<0.02	0.02
Fluoranthene	0.02 ug/g dry	1.96	0.24	0.29	1.23
Fluorene	0.02 ug/g dry	0.08	<0.02	<0.02	0.09
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.21	0.03	0.03	0.09
1-Methylnaphthalene	0.02 ug/g dry	0.03	<0.02	<0.02	0.03
2-Methylnaphthalene	0.02 ug/g dry	0.04	<0.02	<0.02	0.03
Methylnaphthalene (1&2)	0.04 ug/g dry	0.07	<0.04	<0.04	0.06
Naphthalene	0.01 ug/g dry	0.05	<0.01	<0.01	0.06
Phenanthrene	0.02 ug/g dry	0.90	0.08	0.12	0.90
Pyrene	0.02 ug/g dry	1.72	0.25	0.26	1.03
2-Fluorobiphenyl	Surrogate	82.3%	94.0%	76.2%	61.1%
Terphenyl-d14	Surrogate	95.9%	135%	113%	85.0%

Certificate of Analysis

Report Date: 24-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	Lift 5	Lift 6	Lift 7	Lift 8
	Sample Date:	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14
	Sample ID:	1416085-05	1416085-06	1416085-07	1416085-08
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	83.9	92.8	90.3	94.1
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	4.1	2.0	<1.0	2.0
Barium	1.0 ug/g dry	128	107	132	113
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	5.5	4.9	3.0	2.7
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	20.3	10.5	2.5	2.0
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	7.3	4.3	1.4	1.3
Copper	1.0 ug/g dry	24.9	13.4	3.3	2.9
Lead	1.0 ug/g dry	58.5	31.9	8.6	6.7
Mercury	0.1 ug/g dry	0.2	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	15.0	9.1	4.5	3.9
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	30.2	15.6	5.2	4.6
Zinc	1.0 ug/g dry	60.6	29.8	5.9	4.3

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	7.79	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	3.96	0.20	0.02	<0.02
Anthracene	0.02 ug/g dry	40.8	0.17	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	31.6	0.39	0.03	<0.02
Benzo [a] pyrene	0.02 ug/g dry	22.8	0.33	0.03	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	30.2	0.51	0.04	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	4.28	0.08	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	15.9	0.24	<0.02	<0.02
Biphenyl	0.02 ug/g dry	1.01	<0.02	<0.02	<0.02

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Certificate of Analysis

Report Date: 24-Apr-2014

Order Date: 15-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	Lift 5	Lift 6	Lift 7	Lift 8
	Sample Date:	14-Apr-14	14-Apr-14	14-Apr-14	14-Apr-14
	Sample ID:	1416085-05	1416085-06	1416085-07	1416085-08
	MDL/Units	Soil	Soil	Soil	Soil
Chrysene	0.02 ug/g dry	30.9	0.43	0.03	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	1.26	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	120	0.78	0.04	<0.02
Fluorene	0.02 ug/g dry	17.1	0.04	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	4.99	0.09	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	3.63	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	3.85	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	7.48	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	4.45	0.02	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	152	0.37	0.03	<0.02
Pyrene	0.02 ug/g dry	95.3	0.70	0.04	<0.02
2-Fluorobiphenyl	Surrogate	73.1%	81.5%	81.5%	81.5%
Terphenyl-d14	Surrogate	129%	108%	129%	106%

Certificate of Analysis

Report Date: 24-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	Lift 9	-	-	-
Sample Date:	14-Apr-14	-	-	-
Sample ID:	1416085-09	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	92.9	-	-	-
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Metals

Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	2.1	-	-	-
Barium	1.0 ug/g dry	88.5	-	-	-
Beryllium	1.0 ug/g dry	<1.0	-	-	-
Boron	1.0 ug/g dry	4.5	-	-	-
Boron, available	0.5 ug/g dry	<0.5	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	1.0 ug/g dry	6.0	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	2.7	-	-	-
Copper	1.0 ug/g dry	9.5	-	-	-
Lead	1.0 ug/g dry	19.0	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	1.0 ug/g dry	6.4	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.5 ug/g dry	<0.5	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	1.0 ug/g dry	10.1	-	-	-
Zinc	1.0 ug/g dry	16.2	-	-	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	0.08	-	-	-
Anthracene	0.02 ug/g dry	0.06	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.03	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.13	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.15	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.03	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.09	-	-	-
Biphenyl	0.02 ug/g dry	<0.02	-	-	-

Certificate of Analysis

Report Date: 24-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	Lift 9	-	-	-
	Sample Date:	14-Apr-14	-	-	-
	Sample ID:	1416085-09	-	-	-
	MDL/Units	Soil	-	-	-
Chrysene	0.02 ug/g dry	0.17	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	0.30	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.03	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	0.14	-	-	-
Pyrene	0.02 ug/g dry	0.29	-	-	-
2-Fluorobiphenyl	Surrogate	81.0%	-	-	-
Terphenyl-d14	Surrogate	111%	-	-	-

Certificate of Analysis

Report Date: 24-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.872		ug/g		65.4	50-140			
Surrogate: Terphenyl-d14	0.860		ug/g		64.5	50-140			

Certificate of Analysis

Report Date: 24-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 15-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g dry	1.18			0.0	30	
Arsenic	ND	1.0	ug/g dry	ND				30	
Barium	23.0	1.0	ug/g dry	22.4			2.6	30	
Beryllium	ND	1.0	ug/g dry	ND				30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	2.96	1.0	ug/g dry	2.73			8.2	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	7.96	1.0	ug/g dry	7.82			1.8	30	
Cobalt	3.15	1.0	ug/g dry	3.19			1.3	30	
Copper	7.41	1.0	ug/g dry	7.29			1.7	30	
Lead	12.9	1.0	ug/g dry	10.6			19.2	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	6.07	1.0	ug/g dry	5.74			5.6	30	
Selenium	ND	1.0	ug/g dry	ND				30	
Silver	ND	0.5	ug/g dry	ND				30	
Thallium	ND	1.0	ug/g dry	ND				30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	17.3	1.0	ug/g dry	17.4			0.7	30	
Zinc	29.9	1.0	ug/g dry	28.6			4.5	30	
Physical Characteristics									
% Solids	80.3	0.1	% by Wt.	79.4			1.2	25	
Semi-Volatiles									
Acenaphthene	0.042	0.02	ug/g dry	0.022			62.0	40	QR-01
Acenaphthylene	ND	0.02	ug/g dry	ND			0.0	40	
Anthracene	0.078	0.02	ug/g dry	0.052			39.7	40	
Benzo [a] anthracene	0.187	0.02	ug/g dry	0.127			38.2	40	
Benzo [a] pyrene	0.132	0.02	ug/g dry	0.082			46.9	40	QR-01
Benzo [b] fluoranthene	0.203	0.02	ug/g dry	0.117			53.5	40	QR-01
Benzo [g,h,i] perylene	0.083	0.02	ug/g dry	0.054			42.8	40	QR-01
Benzo [k] fluoranthene	0.121	0.02	ug/g dry	0.060			67.0	40	QR-01
Biphenyl	ND	0.02	ug/g dry	ND			0.0	40	
Chrysene	0.183	0.02	ug/g dry	0.120			41.1	40	QR-01
Dibenzo [a,h] anthracene	0.025	0.02	ug/g dry	ND			0.0	40	
Fluoranthene	0.482	0.02	ug/g dry	0.272			55.6	40	QR-01
Fluorene	0.050	0.02	ug/g dry	0.028			56.4	40	QR-01
Indeno [1,2,3-cd] pyrene	0.073	0.02	ug/g dry	0.043			51.7	40	QR-01
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			0.0	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			0.0	40	
Naphthalene	0.032	0.01	ug/g dry	0.014			77.4	40	QR-01
Phenanthrene	0.450	0.02	ug/g dry	0.233			63.4	40	QR-01
Pyrene	0.383	0.02	ug/g dry	0.221			53.7	40	QR-01
Surrogate: 2-Fluorobiphenyl	1.05		ug/g dry	ND	71.6	50-140			
Surrogate: Terphenyl-d14	0.992		ug/g dry	ND	67.5	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 24-Apr-2014
Order Date: 15-Apr-2014

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	279		ug/L	23.6	102	70-130			
Arsenic	275		ug/L	ND	110	70-130			
Barium	691		ug/L	447	97.4	70-130			
Beryllium	260		ug/L	ND	104	70-130			
Boron, available	4.68	0.5	ug/g	ND	93.7	70-122			
Boron	309		ug/L	54.5	102	70-130			
Cadmium	253		ug/L	2.15	100	70-130			
Chromium (VI)	4.7	0.2	ug/g	ND	86.0	70-130			
Chromium	378		ug/L	156	88.7	70-130			
Cobalt	288		ug/L	63.8	89.9	70-130			
Copper	413		ug/L	146	107	70-130			
Lead	440		ug/L	212	91.1	70-130			
Mercury	1.42	0.1	ug/g	ND	94.5	72-128			
Molybdenum	240		ug/L	3.53	94.5	70-130			
Nickel	347		ug/L	115	92.7	70-130			
Selenium	235		ug/L	ND	94.0	70-130			
Silver	207		ug/L	ND	82.9	70-130			
Thallium	204		ug/L	ND	81.7	70-130			
Uranium	245		ug/L	ND	98.0	70-130			
Vanadium	580		ug/L	349	92.4	70-130			
Zinc	784		ug/L	573	84.5	70-130			
Semi-Volatiles									
Acenaphthene	0.186	0.02	ug/g	0.022	89.3	50-140			
Acenaphthylene	0.144	0.02	ug/g	ND	78.6	50-140			
Anthracene	0.181	0.02	ug/g	0.052	70.3	50-140			
Benzo [a] anthracene	0.201	0.02	ug/g	0.127	40.2	50-140			QM-06
Benzo [a] pyrene	0.171	0.02	ug/g	0.082	48.8	50-140			QM-06
Benzo [b] fluoranthene	0.197	0.02	ug/g	0.117	43.3	50-140			QM-06
Benzo [g,h,i] perylene	0.168	0.02	ug/g	0.054	62.5	50-140			
Benzo [k] fluoranthene	0.186	0.02	ug/g	0.060	68.5	50-140			
Biphenyl	0.158	0.02	ug/g	ND	86.2	50-140			
Chrysene	0.211	0.02	ug/g	0.120	49.2	50-140			QM-06
Dibenzo [a,h] anthracene	0.134	0.02	ug/g	ND	73.1	50-140			
Fluoranthene	0.274	0.02	ug/g	0.272	1.12	50-140			QM-06
Fluorene	0.136	0.02	ug/g	0.028	58.8	50-140			
Indeno [1,2,3-cd] pyrene	0.164	0.02	ug/g	0.043	65.8	50-140			
1-Methylnaphthalene	0.144	0.02	ug/g	ND	78.3	50-140			
2-Methylnaphthalene	0.135	0.02	ug/g	ND	73.5	50-140			
Naphthalene	0.172	0.01	ug/g	0.014	86.0	50-140			
Phenanthrene	0.269	0.02	ug/g	0.233	19.4	50-140			QM-06
Pyrene	0.250	0.02	ug/g	0.221	15.8	50-140			QM-06
Surrogate: 2-Fluorobiphenyl	0.996		ug/g		67.8	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 24-Apr-2014
Order Date: 15-Apr-2014

Qualifier Notes:

QC Qualifiers :

QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

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Page 1 of 1

Client Name: <u>Stantec</u>	Project Reference: <u>Boteler Backfill 122510670.225</u>	TAT: <input checked="" type="checkbox"/> Regular [] 3 Day
Contact Name: <u>Jill Peters-Dechman</u>	Quote # <u>City of Ottawa SDA # 01910-91843-501</u>	[] 2 Day [] 1 Day
Address: <u>1331 Clyde Ave Suite 400</u>	PO # <u>225</u>	Date Required: _____
Telephone: <u>613-722-4420</u>	Email Address: <u>jill.peters-dechman@stantec.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 1 RSC Filing [] O. Reg. 558/00 [] PW00 [] 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: <u>1416085</u>		Matrix	Air Volume	# of Containers	Sample Taken		PA #5	Metals by ICP/MS	Hg	Cr VI	B(GWS)
Sample ID/Location Name					Date	Time					
1	Lift 1 BCF214	S	n/a	1	14.04.14	8:20	X	X	X	X	X
2	Lift 2 BCF215	S		1	14.04.14	9:00	X	X	X	X	X
3	Lift 3 BCF216	S		1	14.04.14	9:20	X	X	X	X	X
4	Lift 4 BCF217	S		1	14.04.14	10:00	X	X	X	X	X
5	Lift 5 BCF218	S		1	14.04.14	11:20	X	X	X	X	X
6	Lift 6 BCF219	S		1	14.04.14	12:00	X	X	X	X	X
7	Lift 7 BCF220	S		1	14.04.14	13:00	X	X	X	X	X
8	Lift 8 BCF221	S		1	14.04.14	14:00	X	X	X	X	X
9	Lift Lift 9 BCF222	S		1	14.04.14	14:30	X	X	X	X	X
10											

Comments: please also send results to brenda.thom@stantec.com Method of Delivery: Walk-in

Relinquished By (Sign): <u>B Thom</u>	Received by Driver/Depot:	Received at Lab: <u>[Signature]</u>	Verified By: <u>M/C [Signature]</u>
Relinquished By (Print): <u>Brenda Thom</u>	Date/Time: _____	Date/Time: <u>Apr 15/14</u>	Date/Time: <u>Apr 18/14 12:08</u>
Date/Time: <u>15.04.14 11:06</u>	Temperature: _____ °C	Temperature: <u>14 °C</u>	pH Verified [] By: <u>N/A</u>

Review Items

Lab Number	Analysis	Analyte	Exception
			Default Report (not modified) VERSION 6.12:2007
1406679-DUP1	PAHs by GC-MS - standard scar	Acenaphthene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [a] pyrene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [b] fluoranthene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [g,h,i] perylene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [k] fluoranthene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Chrysene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Fluoranthene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Fluorene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Indeno [1,2,3-cd] pyrene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Naphthalene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Phenanthrene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Pyrene	Exceeds RPD control limit
1406679-DUP1	PAHs by GC-MS - standard scar	Acenaphthene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [a] pyrene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [b] fluoranthene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [g,h,i] perylene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Benzo [k] fluoranthene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Chrysene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Fluoranthene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Fluorene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Indeno [1,2,3-cd] pyrene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Naphthalene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Phenanthrene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-DUP1	PAHs by GC-MS - standard scar	Pyrene	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1406679-MS1	PAHs by GC-MS - standard scar	Benzo [a] anthracene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Benzo [a] pyrene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Benzo [b] fluoranthene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Chrysene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Fluoranthene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Phenanthrene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Pyrene	Exceeds lower control limit
1406679-MS1	PAHs by GC-MS - standard scar	Benzo [a] anthracene	QM-06: Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.
1406679-MS1	PAHs by GC-MS - standard scar	Benzo [a] pyrene	QM-06: Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.
1406679-MS1	PAHs by GC-MS - standard scar	Benzo [b] fluoranthene	QM-06: Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix H
Photolog
June 27, 2014

Appendix H

PHOTOLOG



Photo 1: View down MW14-1, depth 13.2 m BGS, just above karst feature, visible in centre of photo.



Photo 2: View of karst feature, depth 13.6 m BGS, water visible in centre of photo.



Photo 3: View of karst feature, 14.1 m BGS.



Photo 4: View of karst feature, depth 14.4 m BGS. Sediment filled water visible at bottom of photo.



Photo 5: View of sediment present in sampling bailer of collected water from MW14-1 on April 24, 2014.

**FINAL REPORT - PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT**

Appendix I
laboratory certificates of analysis
June 27, 2014

Appendix I

LABORATORY CERTIFICATES OF ANALYSIS

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

200-2781 Lancaster Rd.

Ottawa, ON K1B 1A7

Attn: Jill Peters-Dechman

Client PO: 45064625

Project: 122510670.210/ Boteler Berm

Custody: 9585

Phone: (613) 738-0708

Fax: (613) 738-0721

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

Order #: 1316202

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

Parcel ID	Client ID
1316202-01	MW13-1 SS3
1316202-02	MW13-2 SS3
1316202-03	MW13-3 SS1
1316202-04	MW13-3 SS3
1316202-05	MW13-4 SS1
1316202-06	BH13-5 SS1
1316202-07	BH99 SS1
1316202-08	BH13-6 SS1
1316202-09	MW13-7 SS2

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-MS	19-Apr-13	19-Apr-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	19-Apr-13	24-Apr-13
Conductivity	MOE E3138 - probe @25 °C, water ext	19-Apr-13	19-Apr-13
Cyanide, free	MOE E3015 - Auto Colour, water extraction	19-Apr-13	23-Apr-13
Mercury	EPA 7471A - CVAA, digestion	22-Apr-13	22-Apr-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	19-Apr-13	19-Apr-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	19-Apr-13	20-Apr-13
PCBs, total	SW846 8082A - GC-ECD	19-Apr-13	19-Apr-13
pH	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	22-Apr-13	22-Apr-13
PHC F1	CWS Tier 1 - P&T GC-FID	19-Apr-13	21-Apr-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	22-Apr-13	23-Apr-13
SAR	Calculation	19-Apr-13	23-Apr-13
Solids, %	Gravimetric, calculation	19-Apr-13	19-Apr-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	19-Apr-13	21-Apr-13

Certificate of Analysis

Report Date: 24-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Client ID:	MW13-1 SS3	MW13-2 SS3	MW13-3 SS1	MW13-3 SS3
Sample Date:	12-Apr-13	15-Apr-13	15-Apr-13	15-Apr-13
Sample ID:	1316202-01	1316202-02	1316202-03	1316202-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	87.1	83.8	92.0	90.5
----------	--------------	------	------	------	------

General Inorganics

SAR	0.01 N/A	6.03	4.52	-	-
Conductivity	5 uS/cm	375	301	-	-
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	-	-
pH	0.05 pH Units	7.95	7.73	-	7.83

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.2	1.8	<1.0	1.4
Barium	1.0 ug/g dry	133	90.9	47.7	80.3
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	3.7	1.9	2.9	4.1
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	11.9	14.3	8.3	15.9
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	3.0	2.9	2.4	4.5
Copper	1.0 ug/g dry	12.4	7.3	7.3	8.5
Lead	1.0 ug/g dry	290	56.4	15.1	5.6
Mercury	0.1 ug/g dry	0.4	0.2	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	6.3	6.6	5.5	8.2
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	14.6	20.4	13.1	22.0
Zinc	1.0 ug/g dry	94.5	55.7	19.9	20.5

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 24-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID:	MW13-1 SS3	MW13-2 SS3	MW13-3 SS1	MW13-3 SS3
	Sample Date:	12-Apr-13	15-Apr-13	15-Apr-13	15-Apr-13
	Sample ID:	1316202-01	1316202-02	1316202-03	1316202-04
	MDL/Units	Soil	Soil	Soil	Soil
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID:	MW13-1 SS3	MW13-2 SS3	MW13-3 SS1	MW13-3 SS3
	Sample Date:	12-Apr-13	15-Apr-13	15-Apr-13	15-Apr-13
	Sample ID:	1316202-01	1316202-02	1316202-03	1316202-04
	MDL/Units	Soil	Soil	Soil	Soil
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	124%	125%	124%	123%
Dibromofluoromethane	Surrogate	89.7%	90.7%	90.2%	91.8%
Toluene-d8	Surrogate	109%	112%	111%	110%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	5	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	85	60	35	21
F4 PHCs (C34-C50)	6 ug/g dry	50	80	52	40

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.09	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	0.81	0.02	0.08	<0.02
Anthracene	0.02 ug/g dry	0.67	<0.02	0.07	<0.02
Benzo [a] anthracene	0.02 ug/g dry	1.51	0.03	0.19	<0.02
Benzo [a] pyrene	0.02 ug/g dry	1.50	0.03	0.13	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	1.50	0.03	0.16	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.67	0.08	0.10	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.55	<0.02	0.06	<0.02
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	1.93	0.04	0.21	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.18	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	4.16	0.07	0.31	<0.02
Fluorene	0.02 ug/g dry	0.20	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.69	<0.02	0.09	<0.02
1-Methylnaphthalene	0.02 ug/g dry	0.04	<0.02	0.03	<0.02
2-Methylnaphthalene	0.02 ug/g dry	0.03	<0.02	0.03	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	0.07	<0.04	0.06	<0.04

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Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID:	MW13-1 SS3	MW13-2 SS3	MW13-3 SS1	MW13-3 SS3
	Sample Date:	12-Apr-13	15-Apr-13	15-Apr-13	15-Apr-13
	Sample ID:	1316202-01	1316202-02	1316202-03	1316202-04
	MDL/Units	Soil	Soil	Soil	Soil
Naphthalene	0.01 ug/g dry	0.05	<0.01	0.03	<0.01
Phenanthrene	0.02 ug/g dry	2.00	0.04	0.15	0.04
Pyrene	0.02 ug/g dry	3.52	0.06	0.29	0.02
2-Fluorobiphenyl	Surrogate	84.8%	90.3%	90.8%	79.2%
Terphenyl-d14	Surrogate	64.8%	77.4%	76.8%	66.2%

PCBs

PCBs, total	0.05 ug/g dry	<0.05	<0.05	-	-
Decachlorobiphenyl	Surrogate	49.7% [4]	110%	-	-

Certificate of Analysis

Report Date: 24-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Client ID:	MW13-4 SS1	BH13-5 SS1	BH99 SS1	BH13-6 SS1
Sample Date:	17-Apr-13	17-Apr-13	17-Apr-13	17-Apr-13
Sample ID:	1316202-05	1316202-06	1316202-07	1316202-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	87.6	84.1	84.4	94.7
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.8	1.0	2.0	<1.0
Barium	1.0 ug/g dry	93.9	40.3	42.4	105
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	4.0	2.5	2.5	4.7
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	11.3	12.3	11.2	6.8
Chromium (VI)	0.2 ug/g dry	<0.2	1.0	<0.2	0.4
Cobalt	1.0 ug/g dry	3.3	2.7	2.5	2.5
Copper	1.0 ug/g dry	11.0	8.6	7.4	6.3
Lead	1.0 ug/g dry	157	27.2	25.3	16.8
Mercury	0.1 ug/g dry	0.3	0.1	0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	6.1	6.5	5.5	5.3
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	16.1	17.1	15.4	11.4
Zinc	1.0 ug/g dry	85.4	30.9	27.6	20.9

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID:	MW13-4 SS1	BH13-5 SS1	BH99 SS1	BH13-6 SS1
	Sample Date:	17-Apr-13	17-Apr-13	17-Apr-13	17-Apr-13
	Sample ID:	1316202-05	1316202-06	1316202-07	1316202-08
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID: Sample Date: Sample ID:	MW13-4 SS1 17-Apr-13 1316202-05 Soil	BH13-5 SS1 17-Apr-13 1316202-06 Soil	BH99 SS1 17-Apr-13 1316202-07 Soil	BH13-6 SS1 17-Apr-13 1316202-08 Soil
	MDL/Units				
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	124%	122%	124%	122%
Dibromofluoromethane	Surrogate	91.4%	91.7%	96.2%	92.3%
Toluene-d8	Surrogate	113%	113%	115%	111%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	27	31	18	61
F4 PHCs (C34-C50)	6 ug/g dry	30	21	12	241

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.24	0.03	0.13	<0.02
Acenaphthylene	0.02 ug/g dry	0.35	0.52	0.60	0.07
Anthracene	0.02 ug/g dry	0.67	0.37	0.62	0.06
Benzo [a] anthracene	0.02 ug/g dry	1.41	0.95	1.37	0.19
Benzo [a] pyrene	0.02 ug/g dry	0.94	0.73	1.10	0.13
Benzo [b] fluoranthene	0.02 ug/g dry	0.96	0.90	1.13	0.17
Benzo [g,h,i] perylene	0.02 ug/g dry	0.49	0.51	0.79	0.10
Benzo [k] fluoranthene	0.02 ug/g dry	0.37	0.33	0.45	0.07
Biphenyl	0.02 ug/g dry	0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	1.40	0.98	1.48	0.22
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.13	0.13	0.20	<0.02
Fluoranthene	0.02 ug/g dry	3.42	2.06	3.31	0.34
Fluorene	0.02 ug/g dry	0.39	0.10	0.25	0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.45	0.50	0.81	0.09
1-Methylnaphthalene	0.02 ug/g dry	0.09	0.03	0.03	0.02
2-Methylnaphthalene	0.02 ug/g dry	0.10	0.03	0.04	0.03
Methylnaphthalene (1&2)	0.04 ug/g dry	0.19	0.05	0.08	0.05
Naphthalene	0.01 ug/g dry	0.16	0.04	0.08	0.02
Phenanthrene	0.02 ug/g dry	2.43	0.83	1.84	0.15

Certificate of Analysis

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Project Description: 122510670.210/ Boteler Berm

Client PO: 45064625

	Client ID:	MW13-4 SS1	BH13-5 SS1	BH99 SS1	BH13-6 SS1
	Sample Date:	17-Apr-13	17-Apr-13	17-Apr-13	17-Apr-13
	Sample ID:	1316202-05	1316202-06	1316202-07	1316202-08
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	2.99	1.83	2.83	0.31
2-Fluorobiphenyl	Surrogate	93.2%	87.3%	94.8%	66.4%
Terphenyl-d14	Surrogate	70.8%	70.1%	68.3%	56.0%

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Client ID:	MW13-7 SS2	-	-	-
Sample Date:	17-Apr-13	-	-	-
Sample ID:	1316202-09	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	85.5	-	-	-
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Metals

Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	3.5	-	-	-
Barium	1.0 ug/g dry	198	-	-	-
Beryllium	1.0 ug/g dry	<1.0	-	-	-
Boron	1.0 ug/g dry	4.8	-	-	-
Boron, available	0.5 ug/g dry	<0.5	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	1.0 ug/g dry	19.7	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	5.4	-	-	-
Copper	1.0 ug/g dry	97.9	-	-	-
Lead	1.0 ug/g dry	278	-	-	-
Mercury	0.1 ug/g dry	0.7	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	1.0 ug/g dry	11.2	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.5 ug/g dry	<0.5	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	1.0 ug/g dry	27.9	-	-	-
Zinc	1.0 ug/g dry	177	-	-	-

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	-	-	-
Chloroethane	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	MDL/Units	Client ID: Sample Date: Sample ID: Soil	-	-	-
Chloromethane	0.20 ug/g dry	MW13-7 SS2 17-Apr-13 1316202-09 Soil	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
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)	0.50 ug/g dry	<0.50	-	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	-	-	-
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	-	-	-
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	-	-	-

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	MDL/Units	Client ID: Sample Date: Sample ID:			
		MW13-7 SS2	-	-	-
		17-Apr-13	-	-	-
		1316202-09	-	-	-
		Soil	-	-	-
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	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	130%	-	-	-
Dibromofluoromethane	Surrogate	89.7%	-	-	-
Toluene-d8	Surrogate	105%	-	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	18	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	82	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	100	-	-	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.23	-	-	-
Acenaphthylene	0.02 ug/g dry	1.16	-	-	-
Anthracene	0.02 ug/g dry	1.74	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	3.39	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	2.30	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	3.45	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	1.33	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	1.36	-	-	-
Biphenyl	0.02 ug/g dry	0.02	-	-	-
Chrysene	0.02 ug/g dry	3.28	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.37	-	-	-
Fluoranthene	0.02 ug/g dry	8.23	-	-	-
Fluorene	0.02 ug/g dry	0.74	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	1.35	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.10	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.09	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.19	-	-	-
Naphthalene	0.01 ug/g dry	0.13	-	-	-
Phenanthrene	0.02 ug/g dry	4.75	-	-	-
Pyrene	0.02 ug/g dry	7.29	-	-	-

Certificate of Analysis

Report Date: 24-Apr-2013

Order Date: 18-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Project Description: 122510670.210/ Boteler Berm

Client PO: 45064625

	Client ID:	MW13-7 SS2	-	-	-
	Sample Date:	17-Apr-13	-	-	-
	Sample ID:	1316202-09	-	-	-
	MDL/Units	Soil	-	-	-
2-Fluorobiphenyl	Surrogate	103%	-	-	-
Terphenyl-d14	Surrogate	85.1%	-	-	-

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	0.0848		ug/g		84.8	60-140			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	1.41		ug/g		105	50-140			
Surrogate: Terphenyl-d14	1.26		ug/g		94.6	50-140			

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

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						
Chloroethane	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Chloromethane	ND	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	9.70		ug/g		121	50-140			
Surrogate: Dibromofluoromethane	7.92		ug/g		98.9	50-140			
Surrogate: Toluene-d8	8.39		ug/g		105	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Report Date: 24-Apr-2013
Order Date: 18-Apr-2013

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	229	5	uS/cm	242			5.8	6.2	
Cyanide, free	ND	0.03	ug/g dry	ND				35	
pH	7.91	0.05	pH Units	7.96			0.6	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	9	4	ug/g dry	ND			0.0	30	
F3 PHCs (C16-C34)	20	8	ug/g dry	ND			0.0	30	
F4 PHCs (C34-C50)	28	6	ug/g dry	ND			0.0	30	
Metals									
Antimony	1.22	1.0	ug/g dry	ND			0.0	30	
Arsenic	3.71	1.0	ug/g dry	3.73			0.6	30	
Barium	108	10.0	ug/g dry	107			0.7	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	5.89	1.0	ug/g dry	5.66			4.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	14.9	1.0	ug/g dry	15.4			2.7	30	
Cobalt	7.61	1.0	ug/g dry	7.79			2.3	30	
Copper	33.3	10.0	ug/g dry	34.1			2.2	30	
Lead	52.6	10.0	ug/g dry	55.1			4.7	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	17.1	1.0	ug/g dry	16.8			1.5	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	1.04			0.0	30	
Vanadium	21.2	1.0	ug/g dry	21.3			0.8	30	
Zinc	76.9	10.0	ug/g dry	77.5			0.8	30	
PCBs									
PCBs, total	ND	0.05	ug/g dry	ND				40	
Surrogate: Decachlorobiphenyl	0.0679		ug/g dry	ND	59.1	60-140			S-04
Physical Characteristics									
% Solids	91.8	0.1	% by Wt.	91.3			0.5	25	
Semi-Volatiles									
Acenaphthene	0.256	0.02	ug/g dry	0.091			95.5	40	QR-04
Acenaphthylene	0.869	0.02	ug/g dry	0.808			7.4	40	
Anthracene	1.35	0.02	ug/g dry	0.675			66.9	40	QR-04
Benzo [a] anthracene	2.50	0.02	ug/g dry	1.51			49.3	40	QR-04
Benzo [a] pyrene	2.01	0.02	ug/g dry	1.50			29.1	40	
Benzo [b] fluoranthene	1.89	0.02	ug/g dry	1.50			22.6	40	
Benzo [g,h,i] perylene	0.933	0.02	ug/g dry	0.667			33.3	40	
Benzo [k] fluoranthene	0.734	0.02	ug/g dry	0.553			28.2	40	
Biphenyl	ND	0.02	ug/g dry	ND			0.0	40	
Chrysene	2.64	0.02	ug/g dry	1.93			31.1	40	
Dibenzo [a,h] anthracene	0.255	0.02	ug/g dry	0.183			32.9	40	
Fluoranthene	6.43	0.02	ug/g dry	4.16			43.0	40	QR-04
Fluorene	0.471	0.02	ug/g dry	0.203			79.5	40	QR-04
Indeno [1,2,3-cd] pyrene	0.982	0.02	ug/g dry	0.691			34.8	40	
1-Methylnaphthalene	0.067	0.02	ug/g dry	0.037			57.6	40	QR-04
2-Methylnaphthalene	0.061	0.02	ug/g dry	0.033			57.9	40	QR-04
Naphthalene	0.108	0.01	ug/g dry	0.054			67.2	40	QR-04

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Phenanthrene	3.86	0.02	ug/g dry	2.00			63.5	40	QR-04
Pyrene	5.35	0.02	ug/g dry	3.52			41.1	40	QR-04
Surrogate: 2-Fluorobiphenyl	1.21		ug/g dry	ND	78.7	50-140			
Surrogate: Terphenyl-d14	0.865		ug/g dry	ND	56.5	50-140			
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	
Chloroethane	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Chloromethane	ND	0.20	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	0.50	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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	
1,2,4-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	10.2		ug/g dry	ND	126	50-140			
Surrogate: Dibromofluoromethane	7.25		ug/g dry	ND	90.0	50-140			
Surrogate: Toluene-d8	9.13		ug/g dry	ND	113	50-140			

Certificate of Analysis

Report Date: 24-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.217	0.03	ug/g	ND	72.4	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	204	7	ug/g	ND	102	80-120			
F2 PHCs (C10-C16)	72	4	ug/g	ND	71.1	60-140			
F3 PHCs (C16-C34)	203	8	ug/g	ND	97.0	60-140			
F4 PHCs (C34-C50)	144	6	ug/g	ND	103	60-140			
Metals									
Antimony	258		ug/L	ND	103	70-130			
Arsenic	291		ug/L	74.6	86.6	70-130			
Barium	268		ug/L	ND	107	70-130			
Beryllium	219		ug/L	3.36	86.1	70-130			
Boron, available	5.00	0.5	ug/g	ND	99.9	70-122			
Boron	323		ug/L	113	84.1	70-130			
Cadmium	224		ug/L	4.33	88.0	70-130			
Chromium (VI)	5.1	0.2	ug/g	ND	102	70-130			
Chromium	493		ug/L	307	74.3	70-130			
Cobalt	341		ug/L	156	74.0	70-130			
Copper	268		ug/L	ND	107	70-130			
Lead	272		ug/L	ND	109	70-130			
Mercury	1.71	0.1	ug/g	ND	114	72-128			
Molybdenum	203		ug/L	16.1	74.8	70-130			
Nickel	523		ug/L	337	74.2	70-130			
Selenium	180		ug/L	ND	81.4	70-130			
Silver	202		ug/L	1.36	80.2	70-130			
Thallium	208		ug/L	2.40	82.2	70-130			
Uranium	211		ug/L	20.9	75.9	70-130			
Vanadium	613		ug/L	427	74.3	70-130			
Zinc	260		ug/L	ND	104	70-130			
PCBs									
PCBs, total	0.309	0.05	ug/g	ND	67.2	60-140			
Surrogate: Decachlorobiphenyl	0.0751		ug/g		65.4	60-140			
Semi-Volatiles									
Acenaphthene	0.226	0.02	ug/g	ND	135	50-140			
Acenaphthylene	0.195	0.02	ug/g	ND	117	50-140			
Anthracene	0.172	0.02	ug/g	ND	103	50-140			
Benzo [a] anthracene	0.207	0.02	ug/g	ND	124	50-140			
Benzo [a] pyrene	0.171	0.02	ug/g	ND	102	50-140			
Benzo [b] fluoranthene	0.138	0.02	ug/g	ND	83.0	50-140			
Benzo [g,h,i] perylene	0.162	0.02	ug/g	ND	97.4	50-140			
Benzo [k] fluoranthene	0.140	0.02	ug/g	ND	83.8	50-140			
Biphenyl	0.164	0.02	ug/g	ND	98.5	50-140			
Chrysene	0.218	0.02	ug/g	ND	131	50-140			
Dibenzo [a,h] anthracene	0.145	0.02	ug/g	ND	86.8	50-140			
Fluoranthene	0.216	0.02	ug/g	ND	129	50-140			
Fluorene	0.226	0.02	ug/g	ND	136	50-140			
Indeno [1,2,3-cd] pyrene	0.164	0.02	ug/g	ND	98.1	50-140			
1-Methylnaphthalene	0.165	0.02	ug/g	ND	99.2	50-140			
2-Methylnaphthalene	0.165	0.02	ug/g	ND	99.1	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Report Date: 24-Apr-2013
Order Date: 18-Apr-2013

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Naphthalene	0.177	0.01	ug/g	ND	106	50-140			
Phenanthrene	0.200	0.02	ug/g	ND	120	50-140			
Pyrene	0.207	0.02	ug/g	ND	124	50-140			
Volatiles									
Acetone	8.54	0.50	ug/g	ND	85.4	50-140			
Benzene	3.35	0.02	ug/g	ND	83.8	60-130			
Bromodichloromethane	3.88	0.05	ug/g	ND	97.0	60-130			
Bromoform	4.72	0.05	ug/g	ND	118	60-130			
Bromomethane	5.20	0.05	ug/g	ND	130	50-140			
Carbon Tetrachloride	4.22	0.05	ug/g	ND	105	60-130			
Chlorobenzene	3.36	0.05	ug/g	ND	84.0	60-130			
Chloroethane	3.19	0.05	ug/g	ND	79.8	50-140			
Chloroform	3.34	0.05	ug/g	ND	83.6	60-130			
Chloromethane	4.81	0.20	ug/g	ND	120	50-140			
Dibromochloromethane	4.22	0.05	ug/g	ND	105	60-130			
Dichlorodifluoromethane	3.99	0.05	ug/g	ND	99.7	50-140			
1,2-Dibromoethane	3.43	0.05	ug/g	ND	85.8	60-130			
1,2-Dichlorobenzene	3.25	0.05	ug/g	ND	81.3	60-130			
1,3-Dichlorobenzene	3.50	0.05	ug/g	ND	87.5	60-130			
1,4-Dichlorobenzene	3.34	0.05	ug/g	ND	83.5	60-130			
1,1-Dichloroethane	2.78	0.05	ug/g	ND	69.6	60-130			
1,2-Dichloroethane	4.38	0.05	ug/g	ND	110	60-130			
1,1-Dichloroethylene	2.88	0.05	ug/g	ND	72.1	60-130			
cis-1,2-Dichloroethylene	3.19	0.05	ug/g	ND	79.6	60-130			
trans-1,2-Dichloroethylene	3.38	0.05	ug/g	ND	84.6	60-130			
1,2-Dichloropropane	2.75	0.05	ug/g	ND	68.7	60-130			
cis-1,3-Dichloropropylene	3.51	0.05	ug/g	ND	87.8	60-130			
trans-1,3-Dichloropropylene	3.91	0.05	ug/g	ND	97.8	60-130			
Ethylbenzene	3.25	0.05	ug/g	ND	81.3	60-130			
Hexane	3.05	0.05	ug/g	ND	76.3	60-130			
Methyl Ethyl Ketone (2-Butanone)	6.11	0.50	ug/g	ND	61.1	50-140			
Methyl Butyl Ketone (2-Hexanone)	6.01	2.00	ug/g	ND	60.1	50-140			
Methyl Isobutyl Ketone	5.98	0.50	ug/g	ND	59.8	50-140			
Methyl tert-butyl ether	8.48	0.05	ug/g	ND	84.8	50-140			
Methylene Chloride	2.80	0.05	ug/g	ND	70.1	60-130			
Styrene	3.01	0.05	ug/g	ND	75.1	60-130			
1,1,1,2-Tetrachloroethane	3.15	0.05	ug/g	ND	78.7	60-130			
1,1,2,2-Tetrachloroethane	2.96	0.05	ug/g	ND	73.9	60-130			
Tetrachloroethylene	3.82	0.05	ug/g	ND	95.6	60-130			
Toluene	2.88	0.05	ug/g	ND	72.0	60-130			
1,2,4-Trichlorobenzene	3.70	0.05	ug/g	ND	92.5	60-130			
1,1,1-Trichloroethane	3.92	0.05	ug/g	ND	98.1	60-130			
1,1,2-Trichloroethane	3.05	0.05	ug/g	ND	76.3	60-130			
Trichloroethylene	3.22	0.05	ug/g	ND	80.4	60-130			
Trichlorofluoromethane	3.67	0.05	ug/g	ND	91.8	50-140			
1,3,5-Trimethylbenzene	3.02	0.05	ug/g	ND	75.5	60-130			
Vinyl chloride	3.93	0.02	ug/g	ND	98.3	50-140			
m,p-Xylenes	5.46	0.05	ug/g	ND	68.3	60-130			
o-Xylene	3.14	0.05	ug/g	ND	78.4	60-130			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Report Date: 24-Apr-2013
Order Date: 18-Apr-2013

Qualifier Notes:

Sample Qualifiers :

4 : The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

QC Qualifiers :

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

S-04 : The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

OTTAWA • KINGSTON • NIAGARA • MISSISSAUGA • SARNIA

Client Name: <u>Stanke Consulting Ltd.</u>	Project Reference: <u>Boteler Berm</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day Date Required: <u>Wed. Apr. 24/13</u> <i>per Jill. -m/c</i>
Contact Name: <u>Jill Peters-Dechman / Jason Nagasawa</u>	Quote # <u>City of Ottawa SA - 01910-91843-501</u>	
Address: <u>200-2701 Lancaster Rd Ottawa, ON K2B 2A7</u>	PO # <u>12251070, 210</u>	
Telephone: <u>613-730-0708</u>	Email Address: <u>jill.peters-dechman@stanke.ca jason.nagasawa@stanke.com</u>	

Criteria: O. Reg. 153/04 Table O. Reg. 153/11 (Current) 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

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PbCFE-FA	VOCs	PAH	metals	PH	Chromia (M)	BOD (that water washed)	PCBs	gen. inorganics	O. Reg 558 Newer unknown petroleum hydro.
				Date	Time										
1 MW13-1 SS3 BAH673	S	X	5	2013/04/12	11:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2 MW13-2 SS3 BAH674	S	X	5	2013/04/15	9:20	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3 MW13-3 SS1 BAH675	S	X	4	2013/04/15	12:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4 MW13-3 SS3 BAH676	S	X	4	2013/04/15	12:45	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5 MW13-4 SS1 BAH677	S	X	4	2013/04/17	8:50	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6 BH13-5 SS1 BAH678	S	X	4	2013/04/17	12:20	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7 BH13-5 SS1 BAH679	S	X	4	2013/04/17	12:20	✓	✓	✓	✓	✓	✓	✓	✓	✓	
8 BH13-6 SS1 BAH680	S	X	4	2013/04/17	13:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	
9 MW13-7 SS2 BAH681	S	X	4	2013/04/17	13:30	✓	✓	✓	✓	✓	✓	✓	✓	✓	
10 Reg. 3A7 BAH682	S	X	2	2013/04/17	16:00										✓ 200

Comments: * Full MOE metals & gen. inorganics lists per Jill. -m/c
Method of Delivery: Walk-in

Relinquished By (Print & Sign): <u>J. Urban</u>	Received by Driver/Depot:	Received at Lab: <u>M/C</u>	Verified By: <u>M/C</u>
Date/Time: <u>2013/04/18 11:55</u>	Temperature: _____ °C	Date/Time: <u>Apr 18/13 12:00</u>	Date/Time: <u>Apr 18/13 14:20</u>
		Temperature: <u>5.4</u> °C	pH Verified By: <u>N/A</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

200-2781 Lancaster Rd.

Ottawa, ON K1B 1A7

Attn: Jill Peters-Dechman

Client PO: 45064625

Project: 122510670.210/ Boteler Berm

Custody: 97432

Phone: (613) 738-0708

Fax: (613) 738-0721

Report Date: 23-Apr-2013

Order Date: 22-Apr-2013

Order #: 1317058

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

Parcel ID	Client ID
1317058-01	MW13-1
1317058-02	MW13-2
1317058-03	MW99

Approved By:



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

Certificate of Analysis

Report Date: 23-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	23-Apr-13	23-Apr-13
Chromium, hexavalent	MOE E3056 - colourimetric	23-Apr-13	23-Apr-13
Cyanide, free	MOE E3015 - Auto Colour	23-Apr-13	23-Apr-13
Mercury	EPA 245.1 - Cold Vapour AA	23-Apr-13	23-Apr-13
Metals, ICP-MS	EPA 200.8 - ICP-MS	23-Apr-13	23-Apr-13
PAHs by GC-MS	EPA 625 - GC-MS, extraction	23-Apr-13	23-Apr-13
PCBs, total	EPA 608 - GC-ECD	23-Apr-13	23-Apr-13
pH	EPA 150.1 - pH probe @25 °C	23-Apr-13	23-Apr-13
PHC F1	CWS Tier 1 - P&T GC-FID	23-Apr-13	23-Apr-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	23-Apr-13	23-Apr-13
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	23-Apr-13	23-Apr-13

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

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NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 23-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Client ID:	MW13-1	MW13-2	MW99	-
Sample Date:	22-Apr-13	22-Apr-13	22-Apr-13	-
Sample ID:	1317058-01	1317058-02	1317058-03	-
MDL/Units	Water	Water	Water	-

General Inorganics

Cyanide, free	2 ug/L	<2	<2	-	-
pH	0.1 pH Units	7.2	7.3	-	-

Anions

Chloride	1 mg/L	572	39	-	-
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Metals

Mercury	0.1 ug/L	<0.1	<0.1	<0.1	-
Antimony	0.5 ug/L	0.5	0.5	0.5	-
Arsenic	1 ug/L	<1	1	1	-
Barium	1 ug/L	80	49	50	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	-
Boron	10 ug/L	63	77	79	-
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	-
Chromium	1 ug/L	8	6	5	-
Chromium (VI)	10 ug/L	<10	<10	<10	-
Cobalt	0.5 ug/L	0.6	1.3	1.0	-
Copper	0.5 ug/L	6.0	3.5	3.3	-
Lead	0.1 ug/L	<0.1	<0.1	<0.1	-
Molybdenum	0.5 ug/L	7.1	3.5	3.3	-
Nickel	1 ug/L	6	4	4	-
Selenium	1 ug/L	4	12	12	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	-
Sodium	200 ug/L	460000	86300	85600	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	-
Uranium	0.1 ug/L	2.2	3.7	3.6	-
Vanadium	0.5 ug/L	7.4	10.3	10.1	-
Zinc	5 ug/L	<5	<5	<5	-

Volatiles

Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Report Date: 23-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID:	MW13-1	MW13-2	MW99	
	Sample Date:	22-Apr-13	22-Apr-13	22-Apr-13	
	Sample ID:	1317058-01	1317058-02	1317058-03	
	MDL/Units	Water	Water	Water	
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2,4-Trichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Report Date: 23-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID: Sample Date: Sample ID:	MW13-1 22-Apr-13 1317058-01	MW13-2 22-Apr-13 1317058-02	MW99 22-Apr-13 1317058-03	-
	MDL/Units	Water	Water	Water	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	116%	122%	116%	-
Dibromofluoromethane	Surrogate	98.8%	84.2%	101%	-
Toluene-d8	Surrogate	105%	114%	104%	-

Hydrocarbons

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

Semi-Volatiles

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

Certificate of Analysis

Report Date: 23-Apr-2013

Order Date: 22-Apr-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

	Client ID:	MW13-1	MW13-2	MW99	-
	Sample Date:	22-Apr-13	22-Apr-13	22-Apr-13	-
	Sample ID:	1317058-01	1317058-02	1317058-03	-
	MDL/Units	Water	Water	Water	-
Pyrene	0.01 ug/L	<0.01	<0.01	<0.01	-
Terphenyl-d14	Surrogate	81.1%	80.6%	78.3%	-

PCBs

PCBs, total	0.05 ug/L	<0.05	<0.05	-	-
Decachlorobiphenyl	Surrogate	85.1%	72.5%	-	-

Certificate of Analysis

Report Date: 23-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
General Inorganics									
Cyanide, free	ND	2	ug/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
PCBs									
PCBs, total	ND	0.05	ug/L						
Surrogate: Decachlorobiphenyl	0.352		ug/L		70.4	60-140			
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						

Certificate of Analysis

Report Date: 23-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<i>Surrogate: Terphenyl-d14</i>	15.8		ug/L		79.1	50-140			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
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						
1,3,5-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						
<i>Surrogate: 4-Bromofluorobenzene</i>	37.4		ug/L		117	50-140			
<i>Surrogate: Dibromofluoromethane</i>	38.5		ug/L		120	50-140			
<i>Surrogate: Toluene-d8</i>	26.2		ug/L		81.8	50-140			

Certificate of Analysis

Report Date: 23-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	577	5	mg/L	572			1.0	10	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND				20	
pH	7.1	0.1	pH Units	7.2			1.0	10	
Hydrocarbons									
F1 PHCs (C6-C10)	862	25	ug/L	866			0.5	30	
Metals									
Mercury	ND	0.1	ug/L	ND				20	
Antimony	ND	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	62.4	1	ug/L	61.6			1.4	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	73	10	ug/L	69			6.8	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium (VI)	ND	10	ug/L	ND				20	
Chromium	ND	1	ug/L	ND				20	
Cobalt	0.73	0.5	ug/L	0.68			8.4	20	
Copper	3.12	0.5	ug/L	3.10			0.7	20	
Lead	54.5	0.1	ug/L	54.9			0.8	20	
Molybdenum	3.18	0.5	ug/L	2.59			20.5	20	QR-01
Nickel	5.9	1	ug/L	5.8			3.2	20	
Selenium	1.1	1	ug/L	ND			0.0	20	
Silver	0.14	0.1	ug/L	ND			0.0	20	
Sodium	24600	20000	ug/L	24700			0.4	20	
Thallium	0.26	0.1	ug/L	ND			0.0	20	
Uranium	2.2	0.1	ug/L	2.0			5.1	20	
Vanadium	3.45	0.5	ug/L	3.17			8.6	20	
Zinc	27	5	ug/L	28			4.9	20	
Volatiles									
Acetone	36.9	5.0	ug/L	29.2			23.3	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	

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5415 Morning Glory Cr.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 23-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	
1,3,5-Trimethylbenzene	4.76	0.5	ug/L	4.73			0.6	30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	2.51	0.5	ug/L	2.73			8.4	30	
Surrogate: 4-Bromofluorobenzene	28.4		ug/L	ND	88.7	50-140			
Surrogate: Dibromofluoromethane	30.3		ug/L	ND	94.8	50-140			
Surrogate: Toluene-d8	35.9		ug/L	ND	112	50-140			

Certificate of Analysis

Report Date: 23-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	10.4		mg/L	ND	104	78-112			
General Inorganics									
Cyanide, free	25.4	2	ug/L	ND	84.6	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	1700	25	ug/L	ND	84.9	68-117			
F2 PHCs (C10-C16)	1700	100	ug/L	ND	94.7	60-140			
F3 PHCs (C16-C34)	3520	100	ug/L	ND	94.7	60-140			
F4 PHCs (C34-C50)	2150	100	ug/L	ND	86.6	60-140			
Metals									
Mercury	3.30	0.1	ug/L	ND	110	78-137			
Antimony	54.8		ug/L	0.14	109	80-120			
Arsenic	58.7		ug/L	0.3	117	80-120			
Barium	107		ug/L	61.6	91.2	80-120			
Beryllium	50.1		ug/L	ND	100	80-120			
Boron	113		ug/L	69	88.8	80-120			
Cadmium	46.8		ug/L	0.004	93.6	80-120			
Chromium (VI)	200	10	ug/L	ND	100	70-130			
Chromium	58.5		ug/L	ND	117	80-120			
Cobalt	49.7		ug/L	0.68	98.0	80-120			
Copper	49.1		ug/L	3.10	92.0	80-120			
Lead	99.7		ug/L	54.9	89.5	80-120			
Molybdenum	52.3		ug/L	2.59	99.5	80-120			
Nickel	52.6		ug/L	5.8	93.6	80-120			
Selenium	65.8		ug/L	0.2	131	80-120			QM-07
Silver	46.0		ug/L	ND	92.2	80-120			
Sodium	895		ug/L	ND	89.5	80-120			
Thallium	51.0		ug/L	0.008	102	80-120			
Uranium	53.8		ug/L	2.0	104	80-120			
Vanadium	52.8		ug/L	3.17	99.3	80-120			
Zinc	73		ug/L	28	89.9	80-120			
PCBs									
PCBs, total	0.795	0.05	ug/L	ND	79.5	60-140			
Surrogate: Decachlorobiphenyl	0.364		ug/L		72.8	60-140			
Semi-Volatiles									
Acenaphthene	6.32	0.05	ug/L	ND	126	50-140			
Acenaphthylene	4.79	0.05	ug/L	ND	95.9	50-140			
Anthracene	4.31	0.01	ug/L	ND	86.2	50-140			
Benzo [a] anthracene	5.06	0.01	ug/L	ND	101	50-140			
Benzo [a] pyrene	4.14	0.01	ug/L	ND	82.8	50-140			
Benzo [b] fluoranthene	3.14	0.05	ug/L	ND	62.7	50-140			
Benzo [g,h,i] perylene	3.62	0.05	ug/L	ND	72.4	50-140			
Benzo [k] fluoranthene	3.98	0.05	ug/L	ND	79.5	50-140			
Biphenyl	6.39	0.05	ug/L	ND	128	50-140			
Chrysene	5.15	0.05	ug/L	ND	103	50-140			
Dibenzo [a,h] anthracene	3.58	0.05	ug/L	ND	71.6	50-140			
Fluoranthene	5.90	0.01	ug/L	ND	118	50-140			
Indeno [1,2,3-cd] pyrene	4.06	0.05	ug/L	ND	81.1	50-140			

Certificate of Analysis

Report Date: 23-Apr-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 22-Apr-2013

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	6.22	0.05	ug/L	ND	124	50-140			
2-Methylnaphthalene	6.12	0.05	ug/L	ND	122	50-140			
Naphthalene	4.63	0.05	ug/L	ND	92.5	50-140			
Phenanthrene	4.70	0.05	ug/L	ND	93.9	50-140			
Pyrene	6.22	0.01	ug/L	ND	124	50-140			
Volatiles									
Acetone	82.9	5.0	ug/L	ND	82.9	50-140			
Benzene	40.0	0.5	ug/L	ND	99.9	50-140			
Bromodichloromethane	39.0	0.5	ug/L	ND	97.5	50-140			
Bromoform	33.9	0.5	ug/L	ND	84.6	50-140			
Bromomethane	29.9	0.5	ug/L	ND	74.8	50-140			
Carbon Tetrachloride	37.3	0.2	ug/L	ND	93.2	50-140			
Chlorobenzene	38.5	0.5	ug/L	ND	96.2	50-140			
Chloroethane	30.9	1.0	ug/L	ND	77.2	50-140			
Chloroform	36.3	0.5	ug/L	ND	90.8	50-140			
Chloromethane	31.7	3.0	ug/L	ND	79.2	50-140			
Dibromochloromethane	36.7	0.5	ug/L	ND	91.8	50-140			
Dichlorodifluoromethane	24.6	1.0	ug/L	ND	61.6	50-140			
1,2-Dibromoethane	39.2	0.2	ug/L	ND	98.0	50-140			
1,2-Dichlorobenzene	37.6	0.5	ug/L	ND	94.0	50-140			
1,3-Dichlorobenzene	37.8	0.5	ug/L	ND	94.4	50-140			
1,4-Dichlorobenzene	35.1	0.5	ug/L	ND	87.7	50-140			
1,1-Dichloroethane	37.8	0.5	ug/L	ND	94.5	50-140			
1,2-Dichloroethane	37.6	0.5	ug/L	ND	94.0	50-140			
1,1-Dichloroethylene	34.0	0.5	ug/L	ND	85.0	50-140			
cis-1,2-Dichloroethylene	35.4	0.5	ug/L	ND	88.4	50-140			
trans-1,2-Dichloroethylene	35.8	0.5	ug/L	ND	89.4	50-140			
1,2-Dichloropropane	37.8	0.5	ug/L	ND	94.4	50-140			
cis-1,3-Dichloropropylene	34.4	0.5	ug/L	ND	85.9	50-140			
trans-1,3-Dichloropropylene	36.9	0.5	ug/L	ND	92.2	50-140			
Ethylbenzene	35.8	0.5	ug/L	ND	89.6	50-140			
Hexane	23.2	1.0	ug/L	ND	58.1	50-140			
Methyl Ethyl Ketone (2-Butanone)	107	5.0	ug/L	ND	107	50-140			
Methyl Butyl Ketone (2-Hexanone)	110	10.0	ug/L	ND	110	50-140			
Methyl Isobutyl Ketone	101	5.0	ug/L	ND	101	50-140			
Methyl tert-butyl ether	90.5	2.0	ug/L	ND	90.5	50-140			
Methylene Chloride	33.7	5.0	ug/L	ND	84.3	50-140			
Styrene	39.1	0.5	ug/L	ND	97.8	50-140			
1,1,1,2-Tetrachloroethane	40.0	0.5	ug/L	ND	99.9	50-140			
1,1,2,2-Tetrachloroethane	36.7	0.5	ug/L	ND	91.8	50-140			
Tetrachloroethylene	33.6	0.5	ug/L	ND	84.0	50-140			
Toluene	40.1	0.5	ug/L	ND	100	50-140			
1,2,4-Trichlorobenzene	28.2	0.5	ug/L	ND	70.6	50-140			
1,1,1-Trichloroethane	38.7	0.5	ug/L	ND	96.8	50-140			
1,1,2-Trichloroethane	37.7	0.5	ug/L	ND	94.2	50-140			
Trichloroethylene	37.4	0.5	ug/L	ND	93.4	50-140			
Trichlorofluoromethane	30.0	1.0	ug/L	ND	75.0	50-140			
1,3,5-Trimethylbenzene	35.5	0.5	ug/L	ND	88.8	50-140			
Vinyl chloride	30.7	0.5	ug/L	ND	76.8	50-140			
m,p-Xylenes	84.5	0.5	ug/L	ND	106	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**
Client PO: 45064625

Report Date: 23-Apr-2013
Order Date: 22-Apr-2013

Project Description: 122510670.210/ Boteler Berm

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
o-Xylene	45.4	0.5	ug/L	ND	114	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.210/ Boteler Berm

Report Date: 23-Apr-2013

Order Date: 22-Apr-2013

Qualifier Notes:

QC Qualifiers :

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

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

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Client Name: <u>Stante Consulting Ltd.</u>	Project Reference: <u>Boteler Barn</u>	TAT: Regular 3 Day 2 Day 1 Day
Contact Name: <u>Jill Petros-Dachman / Jason Nagasawa</u>	Quote # <u>City of Ottawa SPA - 01910-91843-501</u>	
Address: <u>200-2781 Lancaster Rd Ottawa ON K2B 1A7</u>	PO # <u>122510670, 210</u>	
Telephone: <u>617-738-5703</u>	Email Address: <u>jill.petros-dachman@stantec.com jason.nagasawa@stantec.com</u>	Date Required: <u>24 hr TAT</u>

Criteria: | | O. Reg. 153/04 Table ___ | | O. Reg. 153/11 (Current) 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

Parcel Order Number: <u>1317058</u>			Matrix	Air Volume	# of Containers	Sample Taken		PHCs FI-F4+BTEX	VOCs	PAHs	Metals by ICP/MS	Hg	CrVI	B (HWS)	PCBs	Inorganics
Sample ID/Location Name		Date				Time										
1	MW13-1 BAH717	GW	X	10	2013/04/22	12:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	MW13-2 BAH718	GW	X	10	2013/04/22	13:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	MW99 BAH719	GW	X	7	2013/04/22	13:20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4																
5																
6																
7																
8																
9																
10																

Comments: - Some samples may contain sediment >1cm; please analyze as requested if the case.

Method of Delivery:

Walk-in

Relinquished By (Print & Sign): <u>J. Urban</u>	Received by Driver/Depot:	Received at Lab: <u>M/C</u>	Verified By: <u>M/C</u>
Date/Time: <u>2013/04/22 17:44</u>	Temperature: _____ °C	Date/Time: <u>Apr 22/13 5:46</u>	Date/Time: <u>Apr 22/13 5:59</u>
		Temperature: <u>15.2 °C</u>	pH Verified By: <u>M/C</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670/Boteler St
Custody: 10421

Report Date: 29-Jul-2013
Order Date: 18-Jul-2013

Order #: 1329318

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

Paracel ID	Client ID
1329318-01	MW13-10 SS7
1329318-02	MW13-11 SS6

Approved By:



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

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Conductivity	MOE E3138 - probe @25 °C, water ext	22-Jul-13	22-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	19-Jul-13	23-Jul-13
PHC F1	CWS Tier 1 - P&T GC-FID	22-Jul-13	24-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	22-Jul-13	23-Jul-13
SAR	Calculation	24-Jul-13	25-Jul-13
Solids, %	Gravimetric, calculation	22-Jul-13	22-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	22-Jul-13	24-Jul-13

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Client ID:	MW13-10 SS7	MW13-11 SS6	-	-
Sample Date:	18-Jul-13	18-Jul-13	-	-
Sample ID:	1329318-01	1329318-02	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	89.3	82.9	-	-
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General Inorganics

SAR	0.01 N/A	0.23	0.59	-	-
Conductivity	5 uS/cm	294	2590	-	-

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-
Chloromethane	0.20 ug/g dry	<0.20	<0.20	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Report Date: 29-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

	Client ID: Sample Date: Sample ID:	MW13-10 SS7 18-Jul-13 1329318-01	MW13-11 SS6 18-Jul-13 1329318-02	-	-
	MDL/Units	Soil	Soil	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	104%	104%	-	-
Dibromofluoromethane	Surrogate	90.5%	90.7%	-	-
Toluene-d8	Surrogate	113%	112%	-	-

Hydrocarbons

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

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	0.19	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	0.04	-	-
Anthracene	0.02 ug/g dry	<0.02	0.51	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	1.20	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	0.81	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	1.82	-	-

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Certificate of Analysis

Report Date: 29-Jul-2013

Order Date: 18-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/Boteler St

	MDL/Units	Client ID:	MW13-10 SS7	MW13-11 SS6		
		Sample Date:	18-Jul-13	18-Jul-13		
		Sample ID:	1329318-01	1329318-02		
			Soil	Soil		
Benzo [g,h,i] perylene	0.02 ug/g dry		<0.02	0.40	-	-
Benzo [k] fluoranthene	0.02 ug/g dry		<0.02	0.88	-	-
Biphenyl	0.02 ug/g dry		<0.02	<0.02	-	-
Chrysene	0.02 ug/g dry		<0.02	1.31	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry		<0.02	0.14	-	-
Fluoranthene	0.02 ug/g dry		<0.02	2.79	-	-
Fluorene	0.02 ug/g dry		<0.02	0.27	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry		<0.02	0.42	-	-
1-Methylnaphthalene	0.02 ug/g dry		<0.02	0.04	-	-
2-Methylnaphthalene	0.02 ug/g dry		<0.02	0.06	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry		<0.04	0.10	-	-
Naphthalene	0.01 ug/g dry		<0.01	0.12	-	-
Phenanthrene	0.02 ug/g dry		<0.02	2.68	-	-
Pyrene	0.02 ug/g dry		<0.02	2.06	-	-
2-Fluorobiphenyl	Surrogate		63.4%	56.0%	-	-
Terphenyl-d14	Surrogate		86.2%	73.8%	-	-

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	1.06		ug/g		79.5	50-140			
Surrogate: Terphenyl-d14	1.36		ug/g		102	50-140			
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						
Chloroethane	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Chloromethane	ND	0.20	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						

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	8.34		ug/g		104	50-140			
Surrogate: Dibromofluoromethane	7.10		ug/g		88.7	50-140			
Surrogate: Toluene-d8	9.11		ug/g		114	50-140			

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	307	5	uS/cm	294			4.5	6.2	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Physical Characteristics									
% Solids	82.5	0.1	% by Wt.	81.1			1.8	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND				40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND				40	
Biphenyl	ND	0.02	ug/g dry	ND				40	
Chrysene	ND	0.02	ug/g dry	ND				40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND				40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND				40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND				40	
Pyrene	ND	0.02	ug/g dry	ND				40	
Surrogate: 2-Fluorobiphenyl	0.905		ug/g dry	ND	59.3	50-140			
Surrogate: Terphenyl-d14	1.31		ug/g dry	ND	85.7	50-140			

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	199	7	ug/g	ND	99.6	80-120			
F2 PHCs (C10-C16)	81	4	ug/g	ND	80.7	60-140			
F3 PHCs (C16-C34)	206	8	ug/g	ND	99.4	60-140			
F4 PHCs (C34-C50)	178	6	ug/g	ND	129	60-140			
Semi-Volatiles									
Acenaphthene	0.103	0.02	ug/g	ND	53.9	50-140			
Acenaphthylene	0.107	0.02	ug/g	ND	56.3	50-140			
Anthracene	0.144	0.02	ug/g	ND	75.6	50-140			
Benzo [a] anthracene	0.181	0.02	ug/g	ND	94.9	50-140			
Benzo [a] pyrene	0.166	0.02	ug/g	ND	87.0	50-140			
Benzo [b] fluoranthene	0.232	0.02	ug/g	ND	121	50-140			
Benzo [g,h,i] perylene	0.180	0.02	ug/g	ND	94.3	50-140			
Benzo [k] fluoranthene	0.250	0.02	ug/g	ND	131	50-140			
Biphenyl	0.105	0.02	ug/g	ND	55.1	50-140			
Chrysene	0.182	0.02	ug/g	ND	95.1	50-140			
Dibenzo [a,h] anthracene	0.175	0.02	ug/g	ND	91.6	50-140			
Fluoranthene	0.186	0.02	ug/g	ND	97.2	50-140			
Fluorene	0.119	0.02	ug/g	ND	62.2	50-140			
Indeno [1,2,3-cd] pyrene	0.181	0.02	ug/g	ND	95.0	50-140			
1-Methylnaphthalene	0.100	0.02	ug/g	ND	52.4	50-140			
2-Methylnaphthalene	0.124	0.02	ug/g	ND	64.8	50-140			
Naphthalene	0.111	0.01	ug/g	ND	58.2	50-140			
Phenanthrene	0.172	0.02	ug/g	ND	90.1	50-140			
Pyrene	0.195	0.02	ug/g	ND	102	50-140			
Surrogate: 2-Fluorobiphenyl	0.763		ug/g		50.0	50-140			
Volatiles									
Acetone	8.39	0.50	ug/g	ND	83.9	50-140			
Benzene	3.69	0.02	ug/g	ND	92.3	60-130			
Bromodichloromethane	3.56	0.05	ug/g	ND	89.1	60-130			
Bromoform	4.18	0.05	ug/g	ND	105	60-130			
Bromomethane	3.58	0.05	ug/g	ND	89.4	50-140			
Carbon Tetrachloride	3.53	0.05	ug/g	ND	88.2	60-130			
Chlorobenzene	3.79	0.05	ug/g	ND	94.7	60-130			
Chloroethane	3.55	0.05	ug/g	ND	88.7	50-140			
Chloroform	3.77	0.05	ug/g	ND	94.4	60-130			
Chloromethane	3.50	0.20	ug/g	ND	87.5	50-140			
Dibromochloromethane	3.95	0.05	ug/g	ND	98.8	60-130			
Dichlorodifluoromethane	2.37	0.05	ug/g	ND	59.3	50-140			
1,2-Dibromoethane	3.51	0.05	ug/g	ND	87.8	60-130			
1,2-Dichlorobenzene	4.19	0.05	ug/g	ND	105	60-130			
1,3-Dichlorobenzene	4.11	0.05	ug/g	ND	103	60-130			
1,4-Dichlorobenzene	3.66	0.05	ug/g	ND	91.4	60-130			
1,1-Dichloroethane	4.26	0.05	ug/g	ND	107	60-130			
1,2-Dichloroethane	4.26	0.05	ug/g	ND	106	60-130			
1,1-Dichloroethylene	3.37	0.05	ug/g	ND	84.1	60-130			
cis-1,2-Dichloroethylene	3.90	0.05	ug/g	ND	97.5	60-130			
trans-1,2-Dichloroethylene	3.79	0.05	ug/g	ND	94.7	60-130			
1,2-Dichloropropane	3.69	0.05	ug/g	ND	92.2	60-130			

Certificate of Analysis

Report Date: 29-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 18-Jul-2013

Client PO: 45064625

Project Description: 122510670/Boteler St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
cis-1,3-Dichloropropylene	3.70	0.05	ug/g	ND	92.6	60-130			
trans-1,3-Dichloropropylene	4.04	0.05	ug/g	ND	101	60-130			
Ethylbenzene	3.86	0.05	ug/g	ND	96.5	60-130			
Hexane	3.41	0.05	ug/g	ND	85.3	60-130			
Methyl Ethyl Ketone (2-Butanone)	10.7	0.50	ug/g	ND	107	50-140			
Methyl Butyl Ketone (2-Hexanone)	11.0	2.00	ug/g	ND	110	50-140			
Methyl Isobutyl Ketone	13.2	0.50	ug/g	ND	132	50-140			
Methyl tert-butyl ether	11.8	0.05	ug/g	ND	118	50-140			
Methylene Chloride	4.14	0.05	ug/g	ND	103	60-130			
Styrene	4.11	0.05	ug/g	ND	103	60-130			
1,1,1,2-Tetrachloroethane	3.64	0.05	ug/g	ND	91.1	60-130			
1,1,2,2-Tetrachloroethane	4.32	0.05	ug/g	ND	108	60-130			
Tetrachloroethylene	3.40	0.05	ug/g	ND	85.1	60-130			
Toluene	3.78	0.05	ug/g	ND	94.5	60-130			
1,2,4-Trichlorobenzene	4.70	0.05	ug/g	ND	117	60-130			
1,1,1-Trichloroethane	3.60	0.05	ug/g	ND	90.1	60-130			
1,1,2-Trichloroethane	3.42	0.05	ug/g	ND	85.5	60-130			
Trichloroethylene	3.37	0.05	ug/g	ND	84.2	60-130			
Trichlorofluoromethane	2.59	0.05	ug/g	ND	64.6	50-140			
1,3,5-Trimethylbenzene	4.04	0.05	ug/g	ND	101	60-130			
Vinyl chloride	2.99	0.02	ug/g	ND	74.8	50-140			
m,p-Xylenes	7.56	0.05	ug/g	ND	94.5	60-130			
o-Xylene	4.24	0.05	ug/g	ND	106	60-130			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/Boteler St

Report Date: 29-Jul-2013

Order Date: 18-Jul-2013

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.

CCME PHC additional information:

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

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Page 1 of 1

Client Name: <i>Stantec</i>	Project Reference: <i>122510670</i>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <i>Jill Petrus-Dechman</i>	Quote # <i>City of Ottawa "SOA" #</i>	<input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> 1 Day
Address: <i>1331 Clyde Ave Suite 400</i>	PO #	Date Required: _____
Telephone:	Email Address:	

Criteria: O. Reg. 153/04 (As Amended) Table 1 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:		Matrix	Air Volume	# of Containers	Sample Taken		PHC/PI-PA	BTEX	VOC	PAH	EC/SAR	FOC				
1329318					Date	Time										
Sample ID/Location Name																
1	MW13-10 SS 7 BA1403	S	/	4	July	Am	X	X	X	X	X					2x250+120+vial
2	MW13-11 SS 6 BA1403	S	/	3	18/2013	Am	X	X	X	X	X					2x250+vial
3	MW13-11 BA1403	S	/	1	↓	Pm						X				120mL
4																
5																
6																
7																
8																
9																
10																

Comments: <i>MW13-10 SS7 potentially add PCB analysis. Allison will call. If have not heard from Allison, dont process PCB's.</i>			Method of Delivery: <i>Wegelin</i>
Relinquished By (Sign): <i>A. Waldich</i>	Received by Driver/Depot:	Received at Lab: <i>1600m 21</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>A. Waldich</i>	Date/Time: _____	Date/Time: <i>July 18/13</i>	Date/Time: <i>July 19/13</i>
Date/Time: <i>2013/07/13 / 17:20</i>	Temperature: _____ °C	Temperature: _____ °C	pH Verified [] By: <i>N/A</i>

11:15a

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.220/Boteler St
Custody: 96640

Report Date: 31-Jul-2013
Order Date: 23-Jul-2013

Order #: 1330139

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

Parcel ID	Client ID
1330139-01	TP2-1
1330139-02	TP3-1
1330139-03	TP5-1
1330139-04	TP4-1
1330139-05	TP8-1
1330139-06	TP9-1
1330139-07	TP12-1
1330139-08	TP11-1
1330139-09	TP10-1
1330139-10	TP7-1

Approved By:



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

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	25-Jul-13	30-Jul-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	24-Jul-13	26-Jul-13
Mercury	EPA 7471A - CVAA, digestion	29-Jul-13	29-Jul-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	29-Jul-13	29-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	25-Jul-13	27-Jul-13
PHC F1	CWS Tier 1 - P&T GC-FID	24-Jul-13	29-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	25-Jul-13	27-Jul-13
Solids, %	Gravimetric, calculation	25-Jul-13	25-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	24-Jul-13	29-Jul-13

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 300-2319 St. Laurent Blvd.
 Ottawa, ON K1G 4J8

MISSISSAUGA
 6845 Kitimat Rd. Unit #27
 Mississauga, ON L5N 6J3

NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Client ID:	TP2-1	TP3-1	TP5-1	TP4-1
Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
Sample ID:	1330139-01	1330139-02	1330139-03	1330139-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	89.4	90.5	88.5	90.8
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	2.9	<1.0
Arsenic	1.0 ug/g dry	3.0	2.3	5.9	2.3
Barium	1.0 ug/g dry	95.4	87.3	494	113
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	3.4	3.5	6.5	3.4
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	0.6	<0.5
Chromium	1.0 ug/g dry	14.1	14.0	19.4	13.1
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	0.3	<0.2
Cobalt	1.0 ug/g dry	4.4	4.3	5.2	4.9
Copper	1.0 ug/g dry	16.2	14.4	52.0	13.6
Lead	1.0 ug/g dry	51.9	50.0	903	22.8
Mercury	0.1 ug/g dry	0.2	0.2	0.8	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	9.1	8.4	11.1	8.9
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	20.7	20.0	23.3	21.4
Zinc	1.0 ug/g dry	52.7	47.0	482	42.7

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP2-1	TP3-1	TP5-1	TP4-1
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330139-01	1330139-02	1330139-03	1330139-04
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP2-1	TP3-1	TP5-1	TP4-1
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330139-01	1330139-02	1330139-03	1330139-04
	MDL/Units	Soil	Soil	Soil	Soil
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	105%	105%	107%	102%
Dibromofluoromethane	Surrogate	74.1%	75.0%	73.6%	73.1%
Toluene-d8	Surrogate	110%	110%	107%	115%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	38	<8	47	<8
F4 PHCs (C34-C50)	6 ug/g dry	8	<6	55	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.03	<0.02	0.03	0.02
Acenaphthylene	0.02 ug/g dry	0.28	0.15	0.27	0.16
Anthracene	0.02 ug/g dry	0.29	0.16	0.31	0.20
Benzo [a] anthracene	0.02 ug/g dry	0.62	0.32	0.48	0.34
Benzo [a] pyrene	0.02 ug/g dry	0.56	0.28	0.40	0.28
Benzo [b] fluoranthene	0.02 ug/g dry	1.21	0.62	0.91	0.56
Benzo [g,h,i] perylene	0.02 ug/g dry	0.40	0.18	0.25	0.16
Benzo [k] fluoranthene	0.02 ug/g dry	0.46	0.23	0.34	0.23
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.66	0.34	0.53	0.37
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.11	0.05	0.09	0.05
Fluoranthene	0.02 ug/g dry	1.16	0.61	1.12	0.79
Fluorene	0.02 ug/g dry	0.04	0.02	0.05	0.04
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.38	0.17	0.25	0.16
1-Methylnaphthalene	0.02 ug/g dry	0.05	0.04	0.03	<0.02
2-Methylnaphthalene	0.02 ug/g dry	0.06	0.05	0.04	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	0.11	0.08	0.07	<0.04
Naphthalene	0.01 ug/g dry	0.05	0.03	0.04	0.04
Phenanthrene	0.02 ug/g dry	0.52	0.27	0.65	0.53
Pyrene	0.02 ug/g dry	1.01	0.55	0.90	0.65
2-Fluorobiphenyl	Surrogate	53.4%	67.8%	54.3%	45.7% [3]

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP2-1	TP3-1	TP5-1	TP4-1
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330139-01	1330139-02	1330139-03	1330139-04
	MDL/Units	Soil	Soil	Soil	Soil
Terphenyl-d14	Surrogate	88.8%	99.1%	77.9%	96.7%

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Client ID:	TP8-1	TP9-1	TP12-1	TP11-1
Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
Sample ID:	1330139-05	1330139-06	1330139-07	1330139-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	94.8	91.1	89.3	89.3
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	9.6
Arsenic	1.0 ug/g dry	3.5	4.5	1.9	8.9
Barium	1.0 ug/g dry	117	120	125	336
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	5.4	4.9	3.5	8.2
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	8.5	13.9	15.6	16.9
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	0.3
Cobalt	1.0 ug/g dry	3.6	4.8	5.1	5.5
Copper	1.0 ug/g dry	9.8	24.8	13.9	41.9
Lead	1.0 ug/g dry	29.2	131	71.6	742
Mercury	0.1 ug/g dry	<0.1	0.4	0.1	1.9
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	7.8	9.9	9.8	10.6
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	0.6
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	11.6	18.1	23.9	17.4
Zinc	1.0 ug/g dry	27.9	73.4	67.8	285

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP8-1	TP9-1	TP12-1	TP11-1
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330139-05	1330139-06	1330139-07	1330139-08
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP8-1	TP9-1	TP12-1	TP11-1
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330139-05	1330139-06	1330139-07	1330139-08
	MDL/Units	Soil	Soil	Soil	Soil
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	106%	92.1%	86.8%	86.7%
Dibromofluoromethane	Surrogate	72.4%	91.5%	99.5%	101%
Toluene-d8	Surrogate	113%	90.7%	92.8%	90.2%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	126	89	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	50	19	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	0.04	0.22	0.06
Acenaphthylene	0.02 ug/g dry	0.19	0.50	0.54	0.10
Anthracene	0.02 ug/g dry	0.23	0.67	1.18	0.27
Benzo [a] anthracene	0.02 ug/g dry	0.40	1.05	2.47	0.45
Benzo [a] pyrene	0.02 ug/g dry	0.33	0.78	1.94	0.35
Benzo [b] fluoranthene	0.02 ug/g dry	0.62	1.46	3.08	0.75
Benzo [g,h,i] perylene	0.02 ug/g dry	0.18	0.41	1.00	0.18
Benzo [k] fluoranthene	0.02 ug/g dry	0.23	0.57	1.38	0.29
Biphenyl	0.02 ug/g dry	<0.02	<0.02	0.02	<0.02
Chrysene	0.02 ug/g dry	0.42	0.96	2.26	0.47
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.06	0.15	0.41	0.05
Fluoranthene	0.02 ug/g dry	0.80	2.68	5.77	1.00
Fluorene	0.02 ug/g dry	0.02	0.13	0.29	0.08
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.19	0.42	1.06	0.18
1-Methylnaphthalene	0.02 ug/g dry	0.02	0.04	0.09	0.05
2-Methylnaphthalene	0.02 ug/g dry	0.02	0.04	0.09	0.05
Methylnaphthalene (1&2)	0.04 ug/g dry	0.04	0.08	0.18	0.10
Naphthalene	0.01 ug/g dry	0.03	0.04	0.13	0.07
Phenanthrene	0.02 ug/g dry	0.38	1.71	3.18	0.85

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP8-1	TP9-1	TP12-1	TP11-1
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330139-05	1330139-06	1330139-07	1330139-08
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	0.73	2.16	4.81	0.82
2-Fluorobiphenyl	Surrogate	60.2%	56.5%	57.2%	55.5%
Terphenyl-d14	Surrogate	99.3%	96.7%	59.5%	85.7%

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Client ID:	TP10-1	TP7-1	-	-
Sample Date:	23-Jul-13	23-Jul-13	-	-
Sample ID:	1330139-09	1330139-10	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	90.9	83.8	-	-
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	-	-
Arsenic	1.0 ug/g dry	3.2	2.6	-	-
Barium	1.0 ug/g dry	114	141	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	5.4	3.3	-	-
Boron, available	0.5 ug/g dry	<0.5	<0.5	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	11.6	20.5	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	0.5	-	-
Cobalt	1.0 ug/g dry	4.3	6.0	-	-
Copper	1.0 ug/g dry	22.8	13.9	-	-
Lead	1.0 ug/g dry	88.6	54.8	-	-
Mercury	0.1 ug/g dry	0.4	0.4	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	9.2	11.1	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	<0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	17.0	29.2	-	-
Zinc	1.0 ug/g dry	58.9	72.5	-	-

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Report Date: 31-Jul-2013

Order Date: 23-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP10-1	TP7-1		
	Sample Date:	23-Jul-13	23-Jul-13		
	Sample ID:	1330139-09	1330139-10		
	MDL/Units	Soil	Soil		
Chloromethane	0.20 ug/g dry	<0.20	<0.20	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-

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Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID: Sample Date: Sample ID:	TP10-1 23-Jul-13 1330139-09 Soil	TP7-1 23-Jul-13 1330139-10 Soil	-	-
	MDL/Units				
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	86.6%	87.3%	-	-
Dibromofluoromethane	Surrogate	101%	98.7%	-	-
Toluene-d8	Surrogate	91.9%	90.6%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	26	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	184	51	-	-
F4 PHCs (C34-C50)	6 ug/g dry	55	19	-	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	2.22 [2]	<0.02	-	-
Acenaphthylene	0.02 ug/g dry	11.3 [2]	0.25	-	-
Anthracene	0.02 ug/g dry	28.1 [2]	0.19	-	-
Benzo [a] anthracene	0.02 ug/g dry	44.4 [2]	0.39	-	-
Benzo [a] pyrene	0.02 ug/g dry	34.4 [2]	0.40	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	67.5 [2]	0.77	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	21.4 [2]	0.24	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	26.7 [2]	0.34	-	-
Biphenyl	0.02 ug/g dry	<0.80 [1] [2]	<0.02	-	-
Chrysene	0.02 ug/g dry	44.2 [2]	0.42	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	5.85 [2]	0.06	-	-
Fluoranthene	0.02 ug/g dry	116 [2]	0.78	-	-
Fluorene	0.02 ug/g dry	7.52 [2]	0.02	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	20.8 [2]	0.25	-	-
1-Methylnaphthalene	0.02 ug/g dry	1.38 [2]	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g dry	1.14 [2]	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	2.52 [2]	<0.04	-	-
Naphthalene	0.01 ug/g dry	1.18 [2]	0.02	-	-
Phenanthrene	0.02 ug/g dry	69.0 [2]	0.27	-	-
Pyrene	0.02 ug/g dry	94.0 [2]	0.69	-	-

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

	Client ID:	TP10-1	TP7-1	-	-
	Sample Date:	23-Jul-13	23-Jul-13	-	-
	Sample ID:	1330139-09	1330139-10	-	-
	MDL/Units	Soil	Soil	-	-
2-Fluorobiphenyl	Surrogate	-	54.1%	-	-
Terphenyl-d14	Surrogate	-	85.3%	-	-

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.729		ug/g		54.7	50-140			
Surrogate: Terphenyl-d14	1.46		ug/g		109	50-140			
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						

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	3.63		ug/g		114	50-140			
Surrogate: Dibromofluoromethane	2.28		ug/g		71.2	50-140			
Surrogate: Toluene-d8	3.72		ug/g		116	50-140			

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	33	8	ug/g dry	26			20.8	30	
F4 PHCs (C34-C50)	9	6	ug/g dry	11			20.2	30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	2.44	1.0	ug/g dry	3.08			23.2	30	
Barium	160	10.0	ug/g dry	155			3.2	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	12.8	1.0	ug/g dry	11.3			12.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.8	1.0	ug/g dry	14.0			1.1	30	
Cobalt	7.44	1.0	ug/g dry	6.96			6.6	30	
Copper	18.3	1.0	ug/g dry	21.1			13.8	30	
Lead	25.9	1.0	ug/g dry	24.9			3.9	30	
Mercury	0.232	0.1	ug/g dry	0.194			18.1	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	13.7	1.0	ug/g dry	14.0			2.1	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	5.13	1.0	ug/g dry	5.20			1.3	30	
Vanadium	11.3	1.0	ug/g dry	11.1			2.0	30	
Zinc	25.8	1.0	ug/g dry	26.3			2.1	30	
Physical Characteristics									
% Solids	84.3	0.1	% by Wt.	85.4			1.3	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	0.188	0.02	ug/g dry	0.145			25.7	40	
Anthracene	0.183	0.02	ug/g dry	0.156			16.0	40	
Benzo [a] anthracene	0.311	0.02	ug/g dry	0.320			3.1	40	
Benzo [a] pyrene	0.343	0.02	ug/g dry	0.279			20.7	40	
Benzo [b] fluoranthene	0.707	0.02	ug/g dry	0.621			12.9	40	
Benzo [g,h,i] perylene	0.230	0.02	ug/g dry	0.184			21.9	40	
Benzo [k] fluoranthene	0.262	0.02	ug/g dry	0.230			13.2	40	
Biphenyl	ND	0.02	ug/g dry	ND				40	
Chrysene	0.328	0.02	ug/g dry	0.343			4.4	40	
Dibenzo [a,h] anthracene	0.067	0.02	ug/g dry	0.055			19.6	40	
Fluoranthene	0.710	0.02	ug/g dry	0.614			14.5	40	
Fluorene	0.021	0.02	ug/g dry	0.021			3.1	40	
Indeno [1,2,3-cd] pyrene	0.216	0.02	ug/g dry	0.172			22.8	40	
1-Methylnaphthalene	0.028	0.02	ug/g dry	0.038			30.6	40	
2-Methylnaphthalene	0.030	0.02	ug/g dry	0.046			41.7	40	QR-01
Naphthalene	0.028	0.01	ug/g dry	0.033			19.3	40	
Phenanthrene	0.269	0.02	ug/g dry	0.275			1.9	40	
Pyrene	0.648	0.02	ug/g dry	0.546			17.0	40	
Surrogate: 2-Fluorobiphenyl	0.931		ug/g dry	ND	63.2	50-140			
Surrogate: Terphenyl-d14	1.54		ug/g dry	ND	105	50-140			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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	
1,2,4-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	4.93		ug/g dry	ND	102	50-140			
Surrogate: Dibromofluoromethane	3.98		ug/g dry	ND	82.1	50-140			
Surrogate: Toluene-d8	5.31		ug/g dry	ND	110	50-140			

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	196	7	ug/g	ND	97.8	80-120			
F2 PHCs (C10-C16)	96	4	ug/g	ND	98.2	60-140			
F3 PHCs (C16-C34)	252	8	ug/g	26	112	60-140			
F4 PHCs (C34-C50)	171	6	ug/g	11	120	60-140			
Metals									
Antimony	226		ug/L	2.24	89.4	70-130			
Arsenic	250		ug/L	61.5	75.4	70-130			
Barium	458		ug/L	ND	91.6	70-130			
Beryllium	204		ug/L	6.96	78.9	70-130			
Boron, available	3.53	0.5	ug/g	ND	70.6	70-122			
Boron	450		ug/L	227	89.3	70-130			
Cadmium	192		ug/L	0.77	76.4	70-130			
Chromium (VI)	4.6	0.2	ug/g	ND	91.0	70-130			
Chromium	477		ug/L	280	78.7	70-130			
Cobalt	313		ug/L	139	69.3	70-130			QM-07
Copper	629		ug/L	421	82.9	70-130			
Lead	737		ug/L	499	95.4	70-130			
Mercury	1.84	0.1	ug/g	0.194	110	72-128			
Molybdenum	186		ug/L	6.03	72.1	70-130			
Nickel	458		ug/L	281	71.0	70-130			
Selenium	179		ug/L	ND	83.3	70-130			
Silver	177		ug/L	0.20	70.7	70-130			
Thallium	188		ug/L	11.6	70.7	70-130			
Uranium	285		ug/L	104	72.4	70-130			
Vanadium	419		ug/L	221	79.2	70-130			
Zinc	718		ug/L	526	76.6	70-130			
Semi-Volatiles									
Acenaphthene	0.069	0.02	ug/g	ND	37.6	50-140			QM-06
Acenaphthylene	0.187	0.02	ug/g	0.145	22.5	50-140			QM-06
Anthracene	0.205	0.02	ug/g	0.156	26.4	50-140			QM-06
Benzo [a] anthracene	0.335	0.02	ug/g	0.320	7.94	50-140			QM-06
Benzo [a] pyrene	0.315	0.02	ug/g	0.279	19.6	50-140			QM-06
Benzo [b] fluoranthene	0.592	0.02	ug/g	0.621	-16.2	50-140			QM-06
Benzo [g,h,i] perylene	0.252	0.02	ug/g	0.184	36.8	50-140			QM-06
Benzo [k] fluoranthene	0.336	0.02	ug/g	0.230	57.5	50-140			QM-06
Biphenyl	0.059	0.02	ug/g	ND	32.0	50-140			QM-06
Chrysene	0.355	0.02	ug/g	0.343	6.52	50-140			QM-06
Dibenzo [a,h] anthracene	0.133	0.02	ug/g	0.055	42.5	50-140			QM-06
Fluoranthene	0.522	0.02	ug/g	0.614	-49.6	50-140			QM-06
Fluorene	0.078	0.02	ug/g	0.021	31.1	50-140			QM-06
Indeno [1,2,3-cd] pyrene	0.256	0.02	ug/g	0.172	45.5	50-140			QM-06
1-Methylnaphthalene	0.108	0.02	ug/g	0.038	37.9	50-140			QM-06
2-Methylnaphthalene	0.107	0.02	ug/g	0.046	32.9	50-140			QM-06
Naphthalene	0.066	0.01	ug/g	0.033	17.6	50-140			QM-06
Phenanthrene	0.255	0.02	ug/g	0.275	-10.7	50-140			QM-06
Pyrene	0.490	0.02	ug/g	0.546	-30.5	50-140			QM-06
Surrogate: 2-Fluorobiphenyl	0.759		ug/g		51.5	50-140			

Volatiles

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	8.32	0.50	ug/g	ND	83.2	50-140			
Benzene	3.88	0.02	ug/g	ND	97.1	60-130			
Bromodichloromethane	3.83	0.05	ug/g	ND	95.7	60-130			
Bromoform	3.63	0.05	ug/g	ND	90.7	60-130			
Bromomethane	4.12	0.05	ug/g	ND	103	50-140			
Carbon Tetrachloride	3.35	0.05	ug/g	ND	83.8	60-130			
Chlorobenzene	4.22	0.05	ug/g	ND	106	60-130			
Chloroethane	3.64	0.05	ug/g	ND	91.1	50-140			
Chloroform	3.65	0.05	ug/g	ND	91.4	60-130			
Chloromethane	3.51	0.20	ug/g	ND	87.8	50-140			
Dibromochloromethane	4.05	0.05	ug/g	ND	101	60-130			
Dichlorodifluoromethane	4.07	0.05	ug/g	ND	102	50-140			
1,2-Dibromoethane	4.23	0.05	ug/g	ND	106	60-130			
1,2-Dichlorobenzene	4.38	0.05	ug/g	ND	109	60-130			
1,3-Dichlorobenzene	4.51	0.05	ug/g	ND	113	60-130			
1,4-Dichlorobenzene	3.90	0.05	ug/g	ND	97.5	60-130			
1,1-Dichloroethane	3.37	0.05	ug/g	ND	84.3	60-130			
1,2-Dichloroethane	3.60	0.05	ug/g	ND	90.0	60-130			
1,1-Dichloroethylene	3.32	0.05	ug/g	ND	83.0	60-130			
cis-1,2-Dichloroethylene	4.05	0.05	ug/g	ND	101	60-130			
trans-1,2-Dichloroethylene	3.45	0.05	ug/g	ND	86.3	60-130			
1,2-Dichloropropane	4.06	0.05	ug/g	ND	101	60-130			
cis-1,3-Dichloropropylene	4.53	0.05	ug/g	ND	113	60-130			
trans-1,3-Dichloropropylene	4.57	0.05	ug/g	ND	114	60-130			
Ethylbenzene	4.37	0.05	ug/g	ND	109	60-130			
Hexane	5.06	0.05	ug/g	ND	127	60-130			
Methyl Ethyl Ketone (2-Butanone)	11.3	0.50	ug/g	ND	113	50-140			
Methyl Butyl Ketone (2-Hexanone)	11.4	2.00	ug/g	ND	114	50-140			
Methyl Isobutyl Ketone	11.2	0.50	ug/g	ND	112	50-140			
Methyl tert-butyl ether	11.0	0.05	ug/g	ND	110	50-140			
Methylene Chloride	3.37	0.05	ug/g	ND	84.3	60-130			
Styrene	4.27	0.05	ug/g	ND	107	60-130			
1,1,1,2-Tetrachloroethane	3.97	0.05	ug/g	ND	99.2	60-130			
1,1,2,2-Tetrachloroethane	4.36	0.05	ug/g	ND	109	60-130			
Tetrachloroethylene	3.93	0.05	ug/g	ND	98.1	60-130			
Toluene	4.46	0.05	ug/g	ND	111	60-130			
1,2,4-Trichlorobenzene	4.16	0.05	ug/g	ND	104	60-130			
1,1,1-Trichloroethane	3.64	0.05	ug/g	ND	91.1	60-130			
1,1,2-Trichloroethane	3.60	0.05	ug/g	ND	90.0	60-130			
Trichloroethylene	3.15	0.05	ug/g	ND	78.7	60-130			
Trichlorofluoromethane	2.82	0.05	ug/g	ND	70.4	50-140			
1,3,5-Trimethylbenzene	4.79	0.05	ug/g	ND	120	60-130			
Vinyl chloride	2.60	0.02	ug/g	ND	65.0	50-140			
m,p-Xylenes	7.91	0.05	ug/g	ND	98.9	60-130			
o-Xylene	4.13	0.05	ug/g	ND	103	60-130			

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/Boteler St

Qualifier Notes:

Sample Qualifiers :

- 1 : Elevated detection limit due to dilution required because of high target analyte concentration.
- 2 : Surrogates not available due to extract dilution.
- 3 : PAH surrogate recovery (2-Fluorobiphenyl) lower than expected due to matrix interference.

QC Qualifiers :

- QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.
- QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.
- QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

OTTAWA • KINGSTON • NIAGARA • MISSISSAUGA • SARNIA

Client Name: Stantec	Project Reference: 122510670-220 task	TAT: <input checked="" type="checkbox"/> Regular 3 Day
Contact Name: Jill Peters-Dechman	Quote # SOA#01910-91843-S01	2 Day 1 Day
Address: 1331 Clyde Ave	PO #	Date Required: _____
Telephone: 613-722-4420	Email Address: jill.peters-dechman@stantec brenda-cooker@stantec	

Criteria: O. Reg. 153/04 Table 1 | O. Reg. 153/11 (Current) Table 1 | 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: 1330139		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP/MS	Hg	CrVI	B (HWS)
Sample ID/Location Name					Date	Time							
1	TP 2-1 / reads BAI 404	S		2	↑	Am	X	X	X	X	X	X	- 950ml + 2 Via -
2	TP 3-1 BAI 405				July	Am	X	X	X	X	X	X	
3	TP 5-1 BAI 406				↓	Am	X	X	X	X	X	X	
4	TP 4-1 BAI 407				28	Am	X	X	X	X	X	X	
5	TP 8-1 BAI 408				28	Pm	X	X	X	X	X	X	
6	TP 9-1 BAI 409				↓	Pm	X	X	X	X	X	X	
7	TP 12-1 BAI 410				↓	Pm	X	X	X	X	X	X	
8	TP 11-1 BAI 411				↓	Pm	X	X	X	X	X	X	
9	TP 10-1 BAI 412				↓	Pm	X	X	X	X	X	X	
10	TP 7-1 BAI 413	↓		↓	↓	Am	X	X	X	X	X	X	↓

Comments: **See attached SSD Form. SC.** Method of Delivery: **Walk-in**

Relinquished By (Print & Sign): A. Waldick	Received by Driver/Depot:	Received at Lab: SC	Verified By: SC
Date/Time: 2013/07/23	Date/Time:	Date/Time: July 23/13	Date/Time: July 23/13
Temperature: _____ °C	Temperature: 12 °C	Temperature: 5:00	pH Verified By: N/A

5:45p

Sample Submission Deficiency Form

Client:	Stantec Consulting		Date:	July 23/13	
Contact:	Jill Peters-Dechman		COC #	96640	
Project:	122510670	REGULATED:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	CSR:	SCoZ
Issue:	<input type="checkbox"/> COC <input checked="" type="checkbox"/> SAMPLE <input type="checkbox"/> OTHER	REG:	153		

Client Sample ID	Problem	Resolution	Initial
TP 2-1	- Cap of jar reads TP1-1, label reads TP2-1.	- Sample should be 2-1 per jar label per Alison	SC
TP 1-2	- Extra sample not on COC	- Dispose-not needed per Alison	SC

Client Notified by Telephone (Date/Time): July 23/13 5:41p
email

Comments: _____

Client must initial samples, sign and return form to lab prior to any work commencing on samples listed on this form.

Client Authorization Signature: _____ DATE: _____

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.215/Boteler St
Custody: 96641

Report Date: 31-Jul-2013
Order Date: 23-Jul-2013

Order #: 1330140

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

Parcel ID	Client ID
1330140-01	TP2-5
1330140-02	TP3-3
1330140-03	TP5-6
1330140-04	TP4-5
1330140-05	TP7-3
1330140-06	TP8-4
1330140-07	TP9-4
1330140-08	TP12-3
1330140-09	TP11-3
1330140-10	TP10-3

Approved By:



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

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	25-Jul-13	30-Jul-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	24-Jul-13	26-Jul-13
Mercury	EPA 7471A - CVAA, digestion	29-Jul-13	29-Jul-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	29-Jul-13	29-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	25-Jul-13	27-Jul-13
PHC F1	CWS Tier 1 - P&T GC-FID	24-Jul-13	29-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	26-Jul-13	27-Jul-13
Solids, %	Gravimetric, calculation	25-Jul-13	25-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	24-Jul-13	29-Jul-13

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

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 6845 Kitimat Rd. Unit #27
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NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Client ID:	TP2-5	TP3-3	TP5-6	TP4-5
Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
Sample ID:	1330140-01	1330140-02	1330140-03	1330140-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	82.3	90.0	85.4	87.4
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.9	2.9	1.8	2.2
Barium	1.0 ug/g dry	109	88.4	126	109
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	3.0	3.3	3.0	3.6
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	15.6	12.8	16.9	14.8
Chromium (VI)	0.2 ug/g dry	<0.2	0.5	<0.2	<0.2
Cobalt	1.0 ug/g dry	4.9	4.2	5.8	4.7
Copper	1.0 ug/g dry	14.1	15.9	12.1	10.4
Lead	1.0 ug/g dry	64.4	66.4	19.1	25.7
Mercury	0.1 ug/g dry	0.1	0.2	<0.1	0.2
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	9.4	8.5	10.5	9.1
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	25.0	18.3	26.9	24.3
Zinc	1.0 ug/g dry	56.4	53.0	39.7	38.6

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP2-5	TP3-3	TP5-6	TP4-5
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330140-01	1330140-02	1330140-03	1330140-04
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	0.12	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP2-5	TP3-3	TP5-6	TP4-5
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330140-01	1330140-02	1330140-03	1330140-04
	MDL/Units	Soil	Soil	Soil	Soil
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	0.25	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	0.07	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	0.32	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	86.7%	87.2%	93.5%	92.7%
Dibromofluoromethane	Surrogate	99.8%	83.2%	88.7%	90.9%
Toluene-d8	Surrogate	90.1%	112%	114%	112%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	58
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	16

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	0.06	0.22	0.05	0.02
Anthracene	0.02 ug/g dry	0.07	0.23	0.05	0.03
Benzo [a] anthracene	0.02 ug/g dry	0.15	0.48	0.10	0.04
Benzo [a] pyrene	0.02 ug/g dry	0.11	0.42	0.07	0.03
Benzo [b] fluoranthene	0.02 ug/g dry	0.25	0.89	0.14	0.07
Benzo [g,h,i] perylene	0.02 ug/g dry	0.06	0.24	0.03	0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.09	0.31	0.07	0.03
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.16	0.49	0.09	0.04
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.02	0.07	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	0.32	0.88	0.24	0.08
Fluorene	0.02 ug/g dry	<0.02	0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.06	0.24	0.04	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	0.04	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	0.05	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	0.10	<0.04	<0.04
Naphthalene	0.01 ug/g dry	0.02	0.04	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	0.18	0.33	0.20	0.04
Pyrene	0.02 ug/g dry	0.27	0.78	0.19	0.07
2-Fluorobiphenyl	Surrogate	52.1%	51.2%	58.7%	51.3%

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP2-5	TP3-3	TP5-6	TP4-5
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330140-01	1330140-02	1330140-03	1330140-04
	MDL/Units	Soil	Soil	Soil	Soil
Terphenyl-d14	Surrogate	80.1%	82.4%	75.6%	90.5%

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Client ID:	TP7-3	TP8-4	TP9-4	TP12-3
Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
Sample ID:	1330140-05	1330140-06	1330140-07	1330140-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	79.5	78.2	82.0	85.0
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	4.0	4.0	<1.0	6.1
Barium	1.0 ug/g dry	325	359	101	337
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	5.7	6.0	2.1	3.7
Boron, available	0.5 ug/g dry	<0.5	0.9	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	0.5
Chromium	1.0 ug/g dry	20.3	21.7	12.1	14.8
Chromium (VI)	0.2 ug/g dry	<0.2	0.6	<0.2	<0.2
Cobalt	1.0 ug/g dry	5.5	5.0	4.0	4.8
Copper	1.0 ug/g dry	506	91.3	9.6	57.4
Lead	1.0 ug/g dry	313	421	4.7	530
Mercury	0.1 ug/g dry	0.7	0.5	<0.1	0.5
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	11.9	10.4	7.2	10.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	27.0	24.2	21.5	19.2
Zinc	1.0 ug/g dry	218	757	18.7	226

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.05
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP7-3	TP8-4	TP9-4	TP12-3
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330140-05	1330140-06	1330140-07	1330140-08
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	0.27
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	0.69
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP7-3	TP8-4	TP9-4	TP12-3
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330140-05	1330140-06	1330140-07	1330140-08
	MDL/Units	Soil	Soil	Soil	Soil
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	2.29
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	0.29
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	2.57
4-Bromofluorobenzene	Surrogate	93.5%	93.0%	94.0%	93.1%
Dibromofluoromethane	Surrogate	89.9%	89.6%	91.0%	99.7%
Toluene-d8	Surrogate	110%	111%	110%	109%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	111
F3 PHCs (C16-C34)	8 ug/g dry	49	92	<8	249
F4 PHCs (C34-C50)	6 ug/g dry	8	26	<6	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	0.19	<0.02	0.12
Acenaphthylene	0.02 ug/g dry	0.63	1.17	<0.02	0.90
Anthracene	0.02 ug/g dry	0.62	1.81	<0.02	1.15
Benzo [a] anthracene	0.02 ug/g dry	1.08	2.58	<0.02	1.62
Benzo [a] pyrene	0.02 ug/g dry	0.94	2.20	<0.02	1.51
Benzo [b] fluoranthene	0.02 ug/g dry	1.86	4.39	<0.02	4.08
Benzo [g,h,i] perylene	0.02 ug/g dry	0.49	1.13	<0.02	1.23
Benzo [k] fluoranthene	0.02 ug/g dry	0.74	1.47	<0.02	1.32
Biphenyl	0.02 ug/g dry	<0.02	0.06	<0.02	0.11
Chrysene	0.02 ug/g dry	1.09	2.87	<0.02	1.93
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.17	0.47	<0.02	0.47
Fluoranthene	0.02 ug/g dry	2.22	6.29	<0.02	3.08
Fluorene	0.02 ug/g dry	0.07	0.41	<0.02	0.22
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.53	1.23	<0.02	1.32
1-Methylnaphthalene	0.02 ug/g dry	0.07	0.21	<0.02	0.67
2-Methylnaphthalene	0.02 ug/g dry	0.09	0.23	<0.02	1.75
Methylnaphthalene (1&2)	0.04 ug/g dry	0.16	0.44	<0.04	2.42
Naphthalene	0.01 ug/g dry	0.09	0.35	<0.01	0.49
Phenanthrene	0.02 ug/g dry	1.03	4.53	<0.02	1.93

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP7-3	TP8-4	TP9-4	TP12-3
	Sample Date:	23-Jul-13	23-Jul-13	23-Jul-13	23-Jul-13
	Sample ID:	1330140-05	1330140-06	1330140-07	1330140-08
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	1.86	5.25	<0.02	2.92
2-Fluorobiphenyl	Surrogate	54.0%	54.1%	96.8%	71.9%
Terphenyl-d14	Surrogate	62.8%	83.9%	120%	105%

Certificate of Analysis

Report Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Client ID:	TP11-3	TP10-3	-	-
Sample Date:	23-Jul-13	23-Jul-13	-	-
Sample ID:	1330140-09	1330140-10	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	80.2	91.4	-	-
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	-	-
Arsenic	1.0 ug/g dry	5.4	3.4	-	-
Barium	1.0 ug/g dry	247	146	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	6.4	5.0	-	-
Boron, available	0.5 ug/g dry	1.2	<0.5	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	20.2	14.6	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	-
Cobalt	1.0 ug/g dry	6.0	5.1	-	-
Copper	1.0 ug/g dry	31.6	22.2	-	-
Lead	1.0 ug/g dry	306	141	-	-
Mercury	0.1 ug/g dry	0.6	0.5	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	11.7	10.1	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	27.1	21.1	-	-
Zinc	1.0 ug/g dry	198	97.9	-	-

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Report Date: 31-Jul-2013

Order Date: 23-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP11-3	TP10-3		
	Sample Date:	23-Jul-13	23-Jul-13		
	Sample ID:	1330140-09	1330140-10		
	MDL/Units	Soil	Soil		
Chloromethane	0.20 ug/g dry	<0.20	<0.20	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-

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Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID: Sample Date: Sample ID:	TP11-3 23-Jul-13 1330140-09 Soil	TP10-3 23-Jul-13 1330140-10 Soil	-	-
	MDL/Units				
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	93.8%	93.3%	-	-
Dibromofluoromethane	Surrogate	89.1%	88.3%	-	-
Toluene-d8	Surrogate	109%	112%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	20	-	-
F3 PHCs (C16-C34)	8 ug/g dry	82	205	-	-
F4 PHCs (C34-C50)	6 ug/g dry	13	87	-	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	0.05	-	-
Acenaphthylene	0.02 ug/g dry	0.73	0.27	-	-
Anthracene	0.02 ug/g dry	0.61	0.36	-	-
Benzo [a] anthracene	0.02 ug/g dry	1.01	0.86	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.95	0.77	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	2.01	1.53	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.52	0.45	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.79	0.62	-	-
Biphenyl	0.02 ug/g dry	<0.02	<0.02	-	-
Chrysene	0.02 ug/g dry	1.38	0.90	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.15	0.13	-	-
Fluoranthene	0.02 ug/g dry	2.91	1.93	-	-
Fluorene	0.02 ug/g dry	0.08	0.09	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.55	0.45	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.05	0.04	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.04	0.04	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.09	0.09	-	-
Naphthalene	0.01 ug/g dry	0.06	0.06	-	-
Phenanthrene	0.02 ug/g dry	1.57	0.93	-	-
Pyrene	0.02 ug/g dry	2.35	1.67	-	-

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

	Client ID:	TP11-3	TP10-3	-	-
	Sample Date:	23-Jul-13	23-Jul-13	-	-
	Sample ID:	1330140-09	1330140-10	-	-
	MDL/Units	Soil	Soil	-	-
2-Fluorobiphenyl	Surrogate	53.8%	83.8%	-	-
Terphenyl-d14	Surrogate	82.2%	96.5%	-	-

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.729		ug/g		54.7	50-140			
Surrogate: Terphenyl-d14	1.46		ug/g		109	50-140			
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						

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	7.59		ug/g		94.9	50-140			
Surrogate: Dibromofluoromethane	7.12		ug/g		89.0	50-140			
Surrogate: Toluene-d8	7.37		ug/g		92.1	50-140			

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	2.44	1.0	ug/g dry	3.08			23.2	30	
Barium	160	10.0	ug/g dry	155			3.2	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	12.8	1.0	ug/g dry	11.3			12.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.8	1.0	ug/g dry	14.0			1.1	30	
Cobalt	7.44	1.0	ug/g dry	6.96			6.6	30	
Copper	18.3	1.0	ug/g dry	21.1			13.8	30	
Lead	25.9	1.0	ug/g dry	24.9			3.9	30	
Mercury	0.232	0.1	ug/g dry	0.194			18.1	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	13.7	1.0	ug/g dry	14.0			2.1	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	5.13	1.0	ug/g dry	5.20			1.3	30	
Vanadium	11.3	1.0	ug/g dry	11.1			2.0	30	
Zinc	25.8	1.0	ug/g dry	26.3			2.1	30	
Physical Characteristics									
% Solids	84.3	0.1	% by Wt.	85.4			1.3	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	0.188	0.02	ug/g dry	0.145			25.7	40	
Anthracene	0.183	0.02	ug/g dry	0.156			16.0	40	
Benzo [a] anthracene	0.311	0.02	ug/g dry	0.320			3.1	40	
Benzo [a] pyrene	0.343	0.02	ug/g dry	0.279			20.7	40	
Benzo [b] fluoranthene	0.707	0.02	ug/g dry	0.621			12.9	40	
Benzo [g,h,i] perylene	0.230	0.02	ug/g dry	0.184			21.9	40	
Benzo [k] fluoranthene	0.262	0.02	ug/g dry	0.230			13.2	40	
Biphenyl	ND	0.02	ug/g dry	ND				40	
Chrysene	0.328	0.02	ug/g dry	0.343			4.4	40	
Dibenzo [a,h] anthracene	0.067	0.02	ug/g dry	0.055			19.6	40	
Fluoranthene	0.710	0.02	ug/g dry	0.614			14.5	40	
Fluorene	0.021	0.02	ug/g dry	0.021			3.1	40	
Indeno [1,2,3-cd] pyrene	0.216	0.02	ug/g dry	0.172			22.8	40	
1-Methylnaphthalene	0.028	0.02	ug/g dry	0.038			30.6	40	
2-Methylnaphthalene	0.030	0.02	ug/g dry	0.046			41.7	40	QR-01
Naphthalene	0.028	0.01	ug/g dry	0.033			19.3	40	
Phenanthrene	0.269	0.02	ug/g dry	0.275			1.9	40	
Pyrene	0.648	0.02	ug/g dry	0.546			17.0	40	
Surrogate: 2-Fluorobiphenyl	0.931		ug/g dry	ND	63.2	50-140			
Surrogate: Terphenyl-d14	1.54		ug/g dry	ND	105	50-140			

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	236	7	ug/g	ND	118	80-120			
F2 PHCs (C10-C16)	62	4	ug/g	ND	62.2	60-140			
F3 PHCs (C16-C34)	164	8	ug/g	ND	80.3	60-140			
F4 PHCs (C34-C50)	85	6	ug/g	ND	62.3	60-140			
Metals									
Antimony	226		ug/L	2.24	89.4	70-130			
Arsenic	250		ug/L	61.5	75.4	70-130			
Barium	458		ug/L	ND	91.6	70-130			
Beryllium	204		ug/L	6.96	78.9	70-130			
Boron, available	3.53	0.5	ug/g	ND	70.6	70-122			
Boron	450		ug/L	227	89.3	70-130			
Cadmium	192		ug/L	0.77	76.4	70-130			
Chromium (VI)	4.6	0.2	ug/g	ND	91.0	70-130			
Chromium	477		ug/L	280	78.7	70-130			
Cobalt	313		ug/L	139	69.3	70-130			QM-07
Copper	629		ug/L	421	82.9	70-130			
Lead	737		ug/L	499	95.4	70-130			
Mercury	1.84	0.1	ug/g	0.194	110	72-128			
Molybdenum	186		ug/L	6.03	72.1	70-130			
Nickel	458		ug/L	281	71.0	70-130			
Selenium	179		ug/L	ND	83.3	70-130			
Silver	177		ug/L	0.20	70.7	70-130			
Thallium	188		ug/L	11.6	70.7	70-130			
Uranium	285		ug/L	104	72.4	70-130			
Vanadium	419		ug/L	221	79.2	70-130			
Zinc	718		ug/L	526	76.6	70-130			
Semi-Volatiles									
Acenaphthene	0.069	0.02	ug/g	ND	37.6	50-140			QM-06
Acenaphthylene	0.187	0.02	ug/g	0.145	22.5	50-140			QM-06
Anthracene	0.205	0.02	ug/g	0.156	26.4	50-140			QM-06
Benzo [a] anthracene	0.335	0.02	ug/g	0.320	7.94	50-140			QM-06
Benzo [a] pyrene	0.315	0.02	ug/g	0.279	19.6	50-140			QM-06
Benzo [b] fluoranthene	0.592	0.02	ug/g	0.621	-16.2	50-140			QM-06
Benzo [g,h,i] perylene	0.252	0.02	ug/g	0.184	36.8	50-140			QM-06
Benzo [k] fluoranthene	0.336	0.02	ug/g	0.230	57.5	50-140			QM-06
Biphenyl	0.059	0.02	ug/g	ND	32.0	50-140			QM-06
Chrysene	0.355	0.02	ug/g	0.343	6.52	50-140			QM-06
Dibenzo [a,h] anthracene	0.133	0.02	ug/g	0.055	42.5	50-140			QM-06
Fluoranthene	0.522	0.02	ug/g	0.614	-49.6	50-140			QM-06
Fluorene	0.078	0.02	ug/g	0.021	31.1	50-140			QM-06
Indeno [1,2,3-cd] pyrene	0.256	0.02	ug/g	0.172	45.5	50-140			QM-06
1-Methylnaphthalene	0.108	0.02	ug/g	0.038	37.9	50-140			QM-06
2-Methylnaphthalene	0.107	0.02	ug/g	0.046	32.9	50-140			QM-06
Naphthalene	0.066	0.01	ug/g	0.033	17.6	50-140			QM-06
Phenanthrene	0.255	0.02	ug/g	0.275	-10.7	50-140			QM-06
Pyrene	0.490	0.02	ug/g	0.546	-30.5	50-140			QM-06
Surrogate: 2-Fluorobiphenyl	0.759		ug/g		51.5	50-140			

Volatiles

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	12.1	0.50	ug/g	ND	121	50-140			
Benzene	3.30	0.02	ug/g	ND	82.5	60-130			
Bromodichloromethane	4.37	0.05	ug/g	ND	109	60-130			
Bromoform	2.44	0.05	ug/g	ND	61.0	60-130			
Bromomethane	2.62	0.05	ug/g	ND	65.6	50-140			
Carbon Tetrachloride	2.65	0.05	ug/g	ND	66.3	60-130			
Chlorobenzene	3.86	0.05	ug/g	ND	96.5	60-130			
Chloroethane	3.64	0.05	ug/g	ND	91.0	50-140			
Chloroform	3.93	0.05	ug/g	ND	98.3	60-130			
Chloromethane	3.88	0.20	ug/g	ND	96.9	50-140			
Dibromochloromethane	2.54	0.05	ug/g	ND	63.5	60-130			
Dichlorodifluoromethane	3.31	0.05	ug/g	ND	82.8	50-140			
1,2-Dibromoethane	5.03	0.05	ug/g	ND	126	60-130			
1,2-Dichlorobenzene	3.12	0.05	ug/g	ND	78.0	60-130			
1,3-Dichlorobenzene	3.16	0.05	ug/g	ND	78.9	60-130			
1,4-Dichlorobenzene	3.60	0.05	ug/g	ND	90.0	60-130			
1,1-Dichloroethane	3.66	0.05	ug/g	ND	91.6	60-130			
1,2-Dichloroethane	3.83	0.05	ug/g	ND	95.8	60-130			
1,1-Dichloroethylene	3.23	0.05	ug/g	ND	80.7	60-130			
cis-1,2-Dichloroethylene	3.65	0.05	ug/g	ND	91.3	60-130			
trans-1,2-Dichloroethylene	3.45	0.05	ug/g	ND	86.2	60-130			
1,2-Dichloropropane	4.30	0.05	ug/g	ND	107	60-130			
cis-1,3-Dichloropropylene	2.62	0.05	ug/g	ND	65.4	60-130			
trans-1,3-Dichloropropylene	4.56	0.05	ug/g	ND	114	60-130			
Ethylbenzene	4.36	0.05	ug/g	ND	109	60-130			
Hexane	3.35	0.05	ug/g	ND	83.9	60-130			
Methyl Ethyl Ketone (2-Butanone)	12.5	0.50	ug/g	ND	125	50-140			
Methyl Butyl Ketone (2-Hexanone)	14.0	2.00	ug/g	ND	140	50-140			
Methyl Isobutyl Ketone	6.97	0.50	ug/g	ND	69.7	50-140			
Methyl tert-butyl ether	12.3	0.05	ug/g	ND	123	50-140			
Methylene Chloride	3.83	0.05	ug/g	ND	95.8	60-130			
Styrene	3.50	0.05	ug/g	ND	87.5	60-130			
1,1,1,2-Tetrachloroethane	3.74	0.05	ug/g	ND	93.6	60-130			
1,1,2,2-Tetrachloroethane	3.00	0.05	ug/g	ND	75.0	60-130			
Tetrachloroethylene	3.95	0.05	ug/g	ND	98.8	60-130			
Toluene	4.00	0.05	ug/g	ND	99.9	60-130			
1,2,4-Trichlorobenzene	4.60	0.05	ug/g	ND	115	60-130			
1,1,1-Trichloroethane	3.77	0.05	ug/g	ND	94.2	60-130			
1,1,2-Trichloroethane	3.88	0.05	ug/g	ND	97.1	60-130			
Trichloroethylene	3.91	0.05	ug/g	ND	97.7	60-130			
Trichlorofluoromethane	3.69	0.05	ug/g	ND	92.2	50-140			
1,3,5-Trimethylbenzene	3.59	0.05	ug/g	ND	89.8	60-130			
Vinyl chloride	3.74	0.02	ug/g	ND	93.6	50-140			
m,p-Xylenes	6.27	0.05	ug/g	ND	78.4	60-130			
o-Xylene	3.24	0.05	ug/g	ND	81.0	60-130			

Certificate of Analysis

Report Date: 31-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 23-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/Boteler St

Qualifier Notes:

QC Qualifiers :

- QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.
- QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.
- QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.
- 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
- ND: Not Detected
- MDL: Method Detection Limit
- Source Result: Data used as source for matrix and duplicate samples
- %REC: Percent recovery.
- RPD: Relative percent difference.

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

CCME PHC additional information:

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

OTTAWA • KINGSTON • NIAGARA • MISSISSAUGA • SARNIA

Client Name: <u>Stantec</u>	Project Reference: <u>122570670 (215) Task</u>	TAT: <input checked="" type="checkbox"/> Regular 3 Day
Contact Name: <u>Jill Petrus-beehman</u>	Quote # <u>SOA#01910-91848-501</u>	2 Day 1 Day
Address: <u>1331 Clyde Ave</u>	PO #	Date Required: _____
Telephone: <u>613-722-4420</u>	Email Address: <u>jill-petrus-beehman@stantec</u> <u>brenda-cooke@stantec</u>	

Criteria: O. Reg. 153/04 Table 1 | O. Reg. 153/11 (Current) Table 1 | 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

Parcel Order Number: <u>1330140</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP/MS	Hg	CrVI	B (HWS)	
Sample ID/Location Name					Date	Time								
1	TP 2-5 BAI 414	S		2	↑	AM	X	X	X	X	X	X	X	850ml + 1Vial ✓
2	TP 3-3 BAI 415				↓	AM								
3	TP 5-6 BAI 416				↓	AM								
4	TP 4-5 BAI 417				↓	AM								
5	TP 7-3 BAI 418				↓	AM								
6	TP 8-4 BAI 419				↓	PM								
7	TP 9-4 BAI 420				↓	PM								
8	TP 12-3 BAI 421				↓	PM								
9	TP 11-3 BAI 422				↓	PM								
10	TP 10-3 BAI 423				↓	PM								

Comments: _____ Method of Delivery: Walk-in

Relinquished By (Print & Sign): <u>A. Waldick / [Signature]</u>	Received by Driver/Depot:	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Date/Time: <u>2013/07/23</u>	Temperature: _____ °C	Date/Time: <u>July 23/13</u>	Date/Time: <u>July 23/13</u>
		Temperature: <u>21.2 °C</u> <u>5:00p</u>	pH Verified By: <u>N/A</u>

5:51p

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.215/ Boteler
Custody:

Report Date: 1-Aug-2013
Order Date: 24-Jul-2013

Order #: 1330222

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

Paracel ID	Client ID
1330222-01	TP13-4
1330222-02	TP15-2
1330222-03	TP18-6
1330222-04	TP17-4
1330222-05	TP16-5
1330222-06	TP19-3
1330222-07	TP20-4
1330222-08	TP21-3
1330222-09	TP24-6
1330222-10	TP30-3
1330222-11	TP26-2
1330222-12	TP25-3
1330222-13	TP27-5
1330222-14	TP29-4
1330222-15	TP23-3
1330222-16	TP28-3

Approved By:



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

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	26-Jul-13	30-Jul-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	25-Jul-13	30-Jul-13
Mercury	EPA 7471A - CVAA, digestion	29-Jul-13	29-Jul-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	31-Jul-13	31-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	26-Jul-13	29-Jul-13
PHC F1	CWS Tier 1 - P&T GC-FID	25-Jul-13	28-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	29-Jul-13	30-Jul-13
Solids, %	Gravimetric, calculation	26-Jul-13	26-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	25-Jul-13	28-Jul-13

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Client ID:	TP13-4	TP15-2	TP18-6	TP17-4
Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID:	1330222-01	1330222-02	1330222-03	1330222-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	84.3	87.6	84.2	89.7
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Metals

		TP13-4	TP15-2	TP18-6	TP17-4
Antimony	1.0 ug/g dry	1.5	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	4.9	3.7	<1.0	3.9
Barium	1.0 ug/g dry	120	138	63.5	164
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	3.5	4.5	2.2	4.8
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	13.7	17.2	11.7	13.8
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	5.1	5.1	4.2	5.1
Copper	1.0 ug/g dry	44.7	22.0	10.3	19.0
Lead	1.0 ug/g dry	142	106	23.2	192
Mercury	0.1 ug/g dry	35.5	0.6	<0.1	3.9
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	10.8	10.7	7.5	9.9
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	23.8	25.1	23.0	21.7
Zinc	1.0 ug/g dry	114	76.8	24.1	217

Volatiles

		TP13-4	TP15-2	TP18-6	TP17-4
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP13-4	TP15-2	TP18-6	TP17-4
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-01	1330222-02	1330222-03	1330222-04
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID: Sample Date: Sample ID:	TP13-4	TP15-2	TP18-6	TP17-4
		24-Jul-13 1330222-01	24-Jul-13 1330222-02	24-Jul-13 1330222-03	24-Jul-13 1330222-04
	MDL/Units	Soil	Soil	Soil	Soil
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	93.3%	93.4%	94.5%	93.4%
Dibromofluoromethane	Surrogate	85.7%	87.9%	88.3%	87.8%
Toluene-d8	Surrogate	107%	110%	109%	111%

Hydrocarbons

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

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	0.07	<0.02	0.07
Acenaphthylene	0.02 ug/g dry	0.03	0.42	<0.02	0.58
Anthracene	0.02 ug/g dry	0.05	0.54	<0.02	0.57
Benzo [a] anthracene	0.02 ug/g dry	0.14	1.10	<0.02	1.15
Benzo [a] pyrene	0.02 ug/g dry	0.12	1.00	<0.02	1.16
Benzo [b] fluoranthene	0.02 ug/g dry	0.20	1.62	<0.02	1.73
Benzo [g,h,i] perylene	0.02 ug/g dry	0.07	0.63	<0.02	0.65
Benzo [k] fluoranthene	0.02 ug/g dry	0.07	0.63	0.04	0.84
Biphenyl	0.02 ug/g dry	0.12	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.15	1.09	<0.02	1.11
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	0.16	<0.02	0.18
Fluoranthene	0.02 ug/g dry	0.19	2.26	0.04	2.19
Fluorene	0.02 ug/g dry	<0.02	0.11	<0.02	0.10
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.06	0.62	<0.02	0.58
1-Methylnaphthalene	0.02 ug/g dry	0.56	<0.02	<0.02	0.04
2-Methylnaphthalene	0.02 ug/g dry	0.92	<0.02	<0.02	0.05
Methylnaphthalene (1&2)	0.04 ug/g dry	1.48	<0.04	<0.04	0.09
Naphthalene	0.01 ug/g dry	0.83	0.06	<0.01	0.07
Phenanthrene	0.02 ug/g dry	0.25	1.16	<0.02	1.13
Pyrene	0.02 ug/g dry	0.20	1.97	0.03	2.09
2-Fluorobiphenyl	Surrogate	53.3%	72.0%	45.5% [2]	78.9%

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP13-4	TP15-2	TP18-6	TP17-4
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-01	1330222-02	1330222-03	1330222-04
	MDL/Units	Soil	Soil	Soil	Soil
Terphenyl-d14	Surrogate	54.5%	64.8%	66.2%	96.3%

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Client ID:	TP16-5	TP19-3	TP20-4	TP21-3
Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID:	1330222-05	1330222-06	1330222-07	1330222-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	82.0	85.5	95.0	85.6
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.6	2.8	1.5	31.7
Barium	1.0 ug/g dry	272	178	85.9	170
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	3.8	4.6	3.2	6.4
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	37.4	18.9	18.2	14.9
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	9.6	5.6	5.1	8.8
Copper	1.0 ug/g dry	25.0	20.7	9.0	39.8
Lead	1.0 ug/g dry	51.7	421	57.0	148
Mercury	0.1 ug/g dry	0.2	0.3	0.1	0.3
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	5.2
Nickel	1.0 ug/g dry	21.5	12.4	10.5	26.1
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	1.1
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	42.1	30.2	32.7	27.1
Zinc	1.0 ug/g dry	88.2	146	47.3	102

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP16-5	TP19-3	TP20-4	TP21-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-05	1330222-06	1330222-07	1330222-08
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP16-5	TP19-3	TP20-4	TP21-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-05	1330222-06	1330222-07	1330222-08
	MDL/Units	Soil	Soil	Soil	Soil
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	92.2%	325% [4]	94.0%	93.0%
Dibromofluoromethane	Surrogate	89.9%	98.1%	87.2%	86.2%
Toluene-d8	Surrogate	113%	108%	104%	108%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	99	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	59	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	72	<8	69
F4 PHCs (C34-C50)	6 ug/g dry	<6	16	<6	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.03	0.07	<0.02	0.52
Acenaphthylene	0.02 ug/g dry	0.17	0.50	0.08	7.46
Anthracene	0.02 ug/g dry	0.18	0.55	0.18	9.31
Benzo [a] anthracene	0.02 ug/g dry	0.39	1.16	0.37	20.8
Benzo [a] pyrene	0.02 ug/g dry	0.34	1.09	0.30	18.2
Benzo [b] fluoranthene	0.02 ug/g dry	0.56	2.02	0.47	16.9
Benzo [g,h,i] perylene	0.02 ug/g dry	0.19	0.63	0.17	7.72
Benzo [k] fluoranthene	0.02 ug/g dry	0.23	0.78	0.20	7.90
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.40 [1]
Chrysene	0.02 ug/g dry	0.40	1.26	0.33	19.5
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.07	0.17	<0.02	1.91
Fluoranthene	0.02 ug/g dry	0.84	2.47	0.74	51.5
Fluorene	0.02 ug/g dry	0.05	0.09	0.04	2.09
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.19	0.64	0.15	7.83
1-Methylnaphthalene	0.02 ug/g dry	<0.02	0.06	<0.02	<0.40 [1]
2-Methylnaphthalene	0.02 ug/g dry	<0.02	0.04	<0.02	<0.40 [1]
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	0.10	<0.04	<0.80 [1]
Naphthalene	0.01 ug/g dry	0.03	0.07	0.01	0.91
Phenanthrene	0.02 ug/g dry	0.46	1.16	0.45	21.7

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Project Description: 122510670.215/ Boteler

Client PO: 45064625

	Client ID:	TP16-5	TP19-3	TP20-4	TP21-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-05	1330222-06	1330222-07	1330222-08
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	0.72	2.10	0.64	38.5
2-Fluorobiphenyl	Surrogate	77.5%	76.9%	74.7%	120%
Terphenyl-d14	Surrogate	77.5%	86.4%	64.5%	79.4%

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Client ID:	TP24-6	TP30-3	TP26-2	TP25-3
Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID:	1330222-09	1330222-10	1330222-11	1330222-12
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	82.7	89.2	93.1	78.9
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Metals

Antimony	1.0 ug/g dry	<1.0	1.9	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	2.6	2.9	2.3
Barium	1.0 ug/g dry	58.3	182	114	214
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	2.4	4.4	5.7	2.8
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	10.5	16.1	8.5	15.2
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	3.8	4.4	3.5	3.7
Copper	1.0 ug/g dry	8.5	25.1	11.5	15.8
Lead	1.0 ug/g dry	7.2	257	43.3	591
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	0.3
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	6.1	9.1	7.3	8.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	20.1	20.9	10.3	19.8
Zinc	1.0 ug/g dry	17.1	205	35.1	149

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

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Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP24-6	TP30-3	TP26-2	TP25-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-09	1330222-10	1330222-11	1330222-12
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP24-6	TP30-3	TP26-2	TP25-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-09	1330222-10	1330222-11	1330222-12
	MDL/Units	Soil	Soil	Soil	Soil
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	0.13	0.11	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	0.16	0.14	<0.05
4-Bromofluorobenzene	Surrogate	91.5%	93.1%	92.7%	92.8%
Dibromofluoromethane	Surrogate	85.7%	86.0%	85.5%	86.5%
Toluene-d8	Surrogate	108%	106%	108%	109%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	43
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	18

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.07
Acenaphthylene	0.02 ug/g dry	<0.02	1.80	0.15	0.30
Anthracene	0.02 ug/g dry	<0.02	1.96	0.17	0.57
Benzo [a] anthracene	0.02 ug/g dry	0.03	2.89	0.26	1.09
Benzo [a] pyrene	0.02 ug/g dry	0.03	2.58	0.19	0.87
Benzo [b] fluoranthene	0.02 ug/g dry	0.05	4.17	0.34	1.44
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	1.36	0.10	0.46
Benzo [k] fluoranthene	0.02 ug/g dry	0.03	2.11	0.15	0.55
Biphenyl	0.02 ug/g dry	<0.02	0.03	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.04	2.76	0.27	0.99
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	0.50	0.04	0.14
Fluoranthene	0.02 ug/g dry	0.06	6.93	0.58	2.17
Fluorene	0.02 ug/g dry	<0.02	0.44	0.08	0.08
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	1.43	0.10	0.47
1-Methylnaphthalene	0.02 ug/g dry	<0.02	0.11	0.04	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	0.11	0.03	0.03
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	0.21	0.08	<0.04
Naphthalene	0.01 ug/g dry	<0.01	0.18	0.03	0.06
Phenanthrene	0.02 ug/g dry	0.03	5.06	0.55	1.18
Pyrene	0.02 ug/g dry	0.05	5.56	0.47	1.92

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP24-6	TP30-3	TP26-2	TP25-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-09	1330222-10	1330222-11	1330222-12
	MDL/Units	Soil	Soil	Soil	Soil
2-Fluorobiphenyl	Surrogate	54.8%	84.0%	78.6%	57.1%
Terphenyl-d14	Surrogate	67.2%	73.2%	67.7%	52.0%

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP27-5	TP29-4	TP23-3	TP28-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-13	1330222-14	1330222-15	1330222-16
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	80.7	81.6	87.8	73.4
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	<1.0	<1.0	1.0	1.8
Barium	1.0 ug/g dry	76.0	67.1	76.8	186
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	2.7	2.6	3.0	3.6
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	12.5	12.4	12.4	18.9
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	4.3	4.3	5.4	6.0
Copper	1.0 ug/g dry	10.6	10.6	9.5	19.3
Lead	1.0 ug/g dry	47.0	3.5	4.7	68.5
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	7.2	7.9	7.9	11.2
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	23.0	23.0	21.6	30.5
Zinc	1.0 ug/g dry	26.2	17.8	18.3	112

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP27-5	TP29-4	TP23-3	TP28-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-13	1330222-14	1330222-15	1330222-16
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

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Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP27-5	TP29-4	TP23-3	TP28-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-13	1330222-14	1330222-15	1330222-16
	MDL/Units	Soil	Soil	Soil	Soil
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	92.2%	93.9%	92.8%	92.7%
Dibromofluoromethane	Surrogate	86.5%	88.0%	87.0%	87.3%
Toluene-d8	Surrogate	108%	111%	108%	109%

Hydrocarbons

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

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	4.22
Acenaphthylene	0.02 ug/g dry	0.06	<0.02	<0.02	0.70
Anthracene	0.02 ug/g dry	0.10	<0.02	<0.02	12.7
Benzo [a] anthracene	0.02 ug/g dry	0.21	<0.02	<0.02	24.2
Benzo [a] pyrene	0.02 ug/g dry	0.17	<0.02	<0.02	18.5
Benzo [b] fluoranthene	0.02 ug/g dry	0.29	<0.02	<0.02	23.5
Benzo [g,h,i] perylene	0.02 ug/g dry	0.09	<0.02	<0.02	8.56
Benzo [k] fluoranthene	0.02 ug/g dry	0.12	<0.02	<0.02	7.16
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	0.76
Chrysene	0.02 ug/g dry	0.18	<0.02	<0.02	23.7
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	2.96
Fluoranthene	0.02 ug/g dry	0.41	<0.02	<0.02	52.2
Fluorene	0.02 ug/g dry	0.03	<0.02	<0.02	6.92
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.09	<0.02	<0.02	8.45
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	1.22
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	1.97
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	3.18
Naphthalene	0.01 ug/g dry	0.02	<0.01	<0.01	8.89
Phenanthrene	0.02 ug/g dry	0.25	<0.02	<0.02	49.2

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	Client ID:	TP27-5	TP29-4	TP23-3	TP28-3
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330222-13	1330222-14	1330222-15	1330222-16
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	0.37	<0.02	<0.02	40.6
2-Fluorobiphenyl	Surrogate	80.6%	61.9%	54.1%	113%
Terphenyl-d14	Surrogate	66.1%	79.9%	68.2%	77.8%

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Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.859		ug/g		64.4	50-140			
Surrogate: Terphenyl-d14	1.01		ug/g		75.5	50-140			
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						

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Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	7.59		ug/g		94.9	50-140			
Surrogate: Dibromofluoromethane	5.12		ug/g		64.0	50-140			
Surrogate: Toluene-d8	7.37		ug/g		92.1	50-140			

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Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	ND	1.0	ug/g dry	1.06			0.0	30	
Barium	64.9	1.0	ug/g dry	84.6			26.4	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	2.62	1.0	ug/g dry	3.01			13.8	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.0	1.0	ug/g dry	14.2			8.7	30	
Cobalt	4.26	1.0	ug/g dry	4.65			8.7	30	
Copper	10.0	1.0	ug/g dry	10.5			4.7	30	
Lead	18.4	1.0	ug/g dry	14.4			24.8	30	
Mercury	4.50	0.1	ug/g dry	4.08			9.6	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	7.63	1.0	ug/g dry	7.93			3.8	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	1.30	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	19.3	1.0	ug/g dry	21.0			8.5	30	
Zinc	26.6	1.0	ug/g dry	25.1			6.1	30	
Physical Characteristics									
% Solids	93.1	0.1	% by Wt.	93.0			0.2	25	
Semi-Volatiles									
Acenaphthene	0.061	0.02	ug/g dry	0.068			11.5	40	
Acenaphthylene	0.123	0.02	ug/g dry	0.578			130.0	40	QR-04
Anthracene	0.317	0.02	ug/g dry	0.568			56.7	40	QR-04
Benzo [a] anthracene	0.498	0.02	ug/g dry	1.15			78.9	40	QR-04
Benzo [a] pyrene	0.439	0.02	ug/g dry	1.16			89.9	40	QR-04
Benzo [b] fluoranthene	0.651	0.02	ug/g dry	1.73			90.8	40	QR-04
Benzo [g,h,i] perylene	0.248	0.02	ug/g dry	0.649			89.4	40	QR-04
Benzo [k] fluoranthene	0.257	0.02	ug/g dry	0.842			106.0	40	QR-04
Biphenyl	ND	0.02	ug/g dry	ND				40	
Chrysene	0.479	0.02	ug/g dry	1.11			79.4	40	QR-04
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	0.177			0.0	40	
Fluoranthene	1.05	0.02	ug/g dry	2.19			70.3	40	QR-04
Fluorene	0.080	0.02	ug/g dry	0.098			20.4	40	
Indeno [1,2,3-cd] pyrene	0.242	0.02	ug/g dry	0.584			82.9	40	QR-04
1-Methylnaphthalene	ND	0.02	ug/g dry	0.041			0.0	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	0.046			0.0	40	
Naphthalene	0.080	0.01	ug/g dry	0.071			10.8	40	
Phenanthrene	0.889	0.02	ug/g dry	1.13			23.9	40	
Pyrene	0.900	0.02	ug/g dry	2.09			79.6	40	QR-04
Surrogate: 2-Fluorobiphenyl	0.903		ug/g dry	ND	60.7	50-140			
Surrogate: Terphenyl-d14	1.23		ug/g dry	ND	83.0	50-140			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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	
1,2,4-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	5.00		ug/g dry	ND	92.5	50-140			
Surrogate: Dibromofluoromethane	4.81		ug/g dry	ND	88.9	50-140			
Surrogate: Toluene-d8	5.98		ug/g dry	ND	111	50-140			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	236	7	ug/g	ND	118	80-120			
F2 PHCs (C10-C16)	62	4	ug/g	ND	62.2	60-140			
F3 PHCs (C16-C34)	144	8	ug/g	ND	69.6	60-140			
F4 PHCs (C34-C50)	85	6	ug/g	ND	61.3	60-140			
Metals									
Antimony	229		ug/L	ND	91.5	70-130			
Arsenic	238		ug/L	ND	95.1	70-130			
Barium	238		ug/L	ND	95.4	70-130			
Beryllium	224		ug/L	ND	89.4	70-130			
Boron, available	4.62	0.5	ug/g	ND	92.4	70-122			
Boron	235		ug/L	ND	94.0	70-130			
Cadmium	223		ug/L	ND	89.3	70-130			
Chromium (VI)	4.6	0.2	ug/g	ND	93.0	70-130			
Chromium	229		ug/L	ND	91.6	70-130			
Cobalt	228		ug/L	ND	91.4	70-130			
Copper	234		ug/L	ND	93.6	70-130			
Lead	219		ug/L	ND	87.8	70-130			
Mercury	1.63	0.1	ug/g	ND	108	72-128			
Molybdenum	236		ug/L	ND	94.4	70-130			
Nickel	232		ug/L	ND	92.6	70-130			
Selenium	228		ug/L	ND	91.0	70-130			
Silver	207		ug/L	ND	82.8	70-130			
Thallium	246		ug/L	ND	98.3	70-130			
Uranium	235		ug/L	ND	93.8	70-130			
Vanadium	235		ug/L	ND	93.8	70-130			
Zinc	222		ug/L	ND	88.6	70-130			
Semi-Volatiles									
Acenaphthene	0.141	0.02	ug/g	ND	84.7	50-140			
Acenaphthylene	0.123	0.02	ug/g	ND	73.8	50-140			
Anthracene	0.129	0.02	ug/g	ND	77.7	50-140			
Benzo [a] anthracene	0.143	0.02	ug/g	ND	86.0	50-140			
Benzo [a] pyrene	0.125	0.02	ug/g	ND	74.7	50-140			
Benzo [b] fluoranthene	0.145	0.02	ug/g	ND	87.3	50-140			
Benzo [g,h,i] perylene	0.123	0.02	ug/g	ND	73.9	50-140			
Benzo [k] fluoranthene	0.151	0.02	ug/g	ND	90.9	50-140			
Biphenyl	0.152	0.02	ug/g	ND	91.4	50-140			
Chrysene	0.139	0.02	ug/g	ND	83.5	50-140			
Dibenzo [a,h] anthracene	0.123	0.02	ug/g	ND	73.7	50-140			
Fluoranthene	0.140	0.02	ug/g	ND	84.3	50-140			
Fluorene	0.133	0.02	ug/g	ND	79.6	50-140			
Indeno [1,2,3-cd] pyrene	0.131	0.02	ug/g	ND	78.8	50-140			
1-Methylnaphthalene	0.167	0.02	ug/g	ND	100	50-140			
2-Methylnaphthalene	0.185	0.02	ug/g	ND	111	50-140			
Naphthalene	0.167	0.01	ug/g	ND	100	50-140			
Phenanthrene	0.143	0.02	ug/g	ND	85.7	50-140			
Pyrene	0.145	0.02	ug/g	ND	87.2	50-140			
Surrogate: 2-Fluorobiphenyl	0.831		ug/g		62.3	50-140			

Volatiles

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	12.1	0.50	ug/g	ND	121	50-140			
Benzene	3.30	0.02	ug/g	ND	82.5	60-130			
Bromodichloromethane	4.37	0.05	ug/g	ND	109	60-130			
Bromoform	2.44	0.05	ug/g	ND	61.0	60-130			
Bromomethane	2.62	0.05	ug/g	ND	65.6	50-140			
Carbon Tetrachloride	2.65	0.05	ug/g	ND	66.3	60-130			
Chlorobenzene	3.86	0.05	ug/g	ND	96.5	60-130			
Chloroethane	3.64	0.05	ug/g	ND	91.0	50-140			
Chloroform	3.93	0.05	ug/g	ND	98.3	60-130			
Chloromethane	3.88	0.20	ug/g	ND	96.9	50-140			
Dibromochloromethane	2.54	0.05	ug/g	ND	63.5	60-130			
Dichlorodifluoromethane	3.31	0.05	ug/g	ND	82.8	50-140			
1,2-Dibromoethane	5.03	0.05	ug/g	ND	126	60-130			
1,2-Dichlorobenzene	3.12	0.05	ug/g	ND	78.0	60-130			
1,3-Dichlorobenzene	3.16	0.05	ug/g	ND	78.9	60-130			
1,4-Dichlorobenzene	3.60	0.05	ug/g	ND	90.0	60-130			
1,1-Dichloroethane	3.66	0.05	ug/g	ND	91.6	60-130			
1,2-Dichloroethane	3.83	0.05	ug/g	ND	95.8	60-130			
1,1-Dichloroethylene	3.23	0.05	ug/g	ND	80.7	60-130			
cis-1,2-Dichloroethylene	3.65	0.05	ug/g	ND	91.3	60-130			
trans-1,2-Dichloroethylene	3.45	0.05	ug/g	ND	86.2	60-130			
1,2-Dichloropropane	4.30	0.05	ug/g	ND	107	60-130			
cis-1,3-Dichloropropylene	2.62	0.05	ug/g	ND	65.4	60-130			
trans-1,3-Dichloropropylene	4.56	0.05	ug/g	ND	114	60-130			
Ethylbenzene	4.36	0.05	ug/g	ND	109	60-130			
Hexane	3.35	0.05	ug/g	ND	83.9	60-130			
Methyl Ethyl Ketone (2-Butanone)	12.5	0.50	ug/g	ND	125	50-140			
Methyl Butyl Ketone (2-Hexanone)	14.0	2.00	ug/g	ND	140	50-140			
Methyl Isobutyl Ketone	6.97	0.50	ug/g	ND	69.7	50-140			
Methyl tert-butyl ether	12.3	0.05	ug/g	ND	123	50-140			
Methylene Chloride	3.83	0.05	ug/g	ND	95.8	60-130			
Styrene	3.50	0.05	ug/g	ND	87.5	60-130			
1,1,1,2-Tetrachloroethane	3.74	0.05	ug/g	ND	93.6	60-130			
1,1,2,2-Tetrachloroethane	3.00	0.05	ug/g	ND	75.0	60-130			
Tetrachloroethylene	3.95	0.05	ug/g	ND	98.8	60-130			
Toluene	4.00	0.05	ug/g	ND	99.9	60-130			
1,2,4-Trichlorobenzene	4.60	0.05	ug/g	ND	115	60-130			
1,1,1-Trichloroethane	3.77	0.05	ug/g	ND	94.2	60-130			
1,1,2-Trichloroethane	3.88	0.05	ug/g	ND	97.1	60-130			
Trichloroethylene	3.91	0.05	ug/g	ND	97.7	60-130			
Trichlorofluoromethane	3.69	0.05	ug/g	ND	92.2	50-140			
1,3,5-Trimethylbenzene	3.59	0.05	ug/g	ND	89.8	60-130			
Vinyl chloride	3.74	0.02	ug/g	ND	93.6	50-140			
m,p-Xylenes	6.27	0.05	ug/g	ND	78.4	60-130			
o-Xylene	3.24	0.05	ug/g	ND	81.0	60-130			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Qualifier Notes:

Sample Qualifiers :

- 1 : Elevated detection limit due to dilution required because of high target analyte concentration.
- 2 : PAH surrogate recovery (2-Fluorobiphenyl) lower than expected due to matrix interference.
- 4 : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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



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Page 1 of 2

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Client Name: Stantec Consulting Ltd. Project Reference: 122510670-220-215
 Contact Name: Jill Peters-Dechman Quote # City Of Ottawa SOA 19609-91843-S01
 Address: 1331 Clyde Avenue Suite 400 PO #
 Ottawa, ON K2C3G4 Email Address: jill.peters-dechman@stantec.com
 Telephone: 613-722-4420 Date Required: _____
 Email Address: *brenda-cocke@stantec*

Criteria: O. Reg. 153 (As Amended) Table 1 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:		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CVI	B (HWS)	PCBs	FOC	EC/SAR	pH			
1330222					Date	Time														
Sample ID/Location Name																				
1	TP13-4. BA1424	S		2		Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	TP15-2. BA1425	S				Bm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	TP18-6. BA1426	S			July	Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	TP17-4. BA1427	S				Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	TP16-5. BA1428	S			24/	Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	TP19-3. BA1429	S			2013		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	TP20-4. BA1430	S					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	TP21-3. BA1431	S					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	TP24-6. BA1432	S					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	TP30-3. BA1433	S				Pm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

250ml + 1ml

Method of Delivery:
Walk-in

Comments:

Relinquished By (Sign): <i>A. Waldrich</i>	Received by Driver/Depot:	Received at Lab: <i>MJC</i>	Verified By: <i>MJC</i>
Relinquished By (Print): <i>A. Waldrich</i>	Date/Time:	Date/Time: <i>July 24/13 6:23</i>	Date/Time: <i>July 25/13 10:32</i>
Date/Time: <i>2013/07/24</i>	Temperature: _____ °C	Temperature: <i>18.1</i> °C	pH Verified [] By: <i>NA</i>



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Page 2 of 2

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Client Name: Stantec Consulting Ltd.	Project Reference: 122510670.220-215	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: Jill Peters-Dechman	Quote #: City Of Ottawa SOA 19609-91843-S01	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: 1331 Clyde Avenue Suite 400 Ottawa, ON K2C3G4	PO #	Date Required: _____
Telephone: 613-722-4420	Email Address: jill.peters-dechman@stantec.com branda.cooper@stantec	

Criteria: O. Reg. 153 (As Amended) Table 1 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)

Paracel Order Number: <u>1330222</u>		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCBs	FOC	EC/SAR	pH			
Sample ID/Location Name					Date	Time														
1	TP 26-2 BAI 434	S		2	1	PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	TP 25-3 BAI 435	S			July	PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	TP 27-5 BAI 436	S				PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	TP 29-4 BAI 437	S			24/	PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	TP 28-2 TP 23-3 BAI 438	S			2013	PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	TP 28-3 BAI 439	S				PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7		S					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		S					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		S					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10		S					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____ Method of Delivery: Walk-in

Relinquished By (Sign): <u>A. Waldich</u>	Received by Driver/Depot:	Received at Lab: <u>M/C</u>	Verified By: <u>M/C</u>
Relinquished By (Print): <u>A. Waldich</u>	Date/Time:	Date/Time: <u>July 24/13 6:23</u>	Date/Time: <u>July 25/13 12:32</u>
Date/Time: <u>2013/07/24</u>	Temperature: _____ °C	Temperature: <u>18.1</u> °C	pH Verified [] By: <u>N/A</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.220/ Boteler
Custody:

Report Date: 1-Aug-2013
Order Date: 24-Jul-2013

Order #: 1330254

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

Paracel ID	Client ID
1330254-01	TP13-1
1330254-02	TP14-1
1330254-03	TP15-1
1330254-04	TP18-1
1330254-05	TP17-1
1330254-06	TP16-1
1330254-07	TP19-1
1330254-08	TP20-1
1330254-09	TP21-1
1330254-10	TP23-1
1330254-11	TP30-1
1330254-12	TP26-1
1330254-13	TP25-1
1330254-14	TP29-1
1330254-15	TP27-1
1330254-16	TP28-1
1330254-17	TP24-1

Approved By:



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

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	29-Jul-13	30-Jul-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	26-Jul-13	30-Jul-13
Mercury	EPA 7471A - CVAA, digestion	29-Jul-13	30-Jul-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	29-Jul-13	29-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	29-Jul-13	30-Jul-13
PHC F1	CWS Tier 1 - P&T GC-FID	29-Jul-13	31-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	30-Jul-13	30-Jul-13
Solids, %	Gravimetric, calculation	29-Jul-13	29-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	29-Jul-13	31-Jul-13

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Client ID:	TP13-1	TP14-1	TP15-1	TP18-1
Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID:	1330254-01	1330254-02	1330254-03	1330254-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	85.4	86.9	88.2	85.3
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.7	1.6	3.2	1.1
Barium	1.0 ug/g dry	71.3	122	117	67.8
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	2.9	3.5	5.1	2.2
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	14.0	14.5	15.3	12.1
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	4.1	4.8	5.1	4.0
Copper	1.0 ug/g dry	10.5	13.4	22.8	11.2
Lead	1.0 ug/g dry	24.4	22.6	77.0	12.1
Mercury	0.1 ug/g dry	<0.1	0.1	0.3	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	8.5	9.2	10.2	7.5
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	21.8	22.6	20.7	20.9
Zinc	1.0 ug/g dry	38.0	58.2	63.7	39.9

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP13-1	TP14-1	TP15-1	TP18-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-01	1330254-02	1330254-03	1330254-04
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP13-1	TP14-1	TP15-1	TP18-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-01	1330254-02	1330254-03	1330254-04
	MDL/Units	Soil	Soil	Soil	Soil
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	101%	101%	102%	101%
Dibromofluoromethane	Surrogate	104%	103%	104%	102%
Toluene-d8	Surrogate	107%	109%	107%	106%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	66	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	18	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	0.05	0.18
Acenaphthylene	0.02 ug/g dry	0.07	0.09	0.25	0.30
Anthracene	0.02 ug/g dry	0.10	0.15	0.47	0.74
Benzo [a] anthracene	0.02 ug/g dry	0.21	0.24	0.87	1.67
Benzo [a] pyrene	0.02 ug/g dry	0.20	0.24	0.85	1.57
Benzo [b] fluoranthene	0.02 ug/g dry	0.24	0.28	0.37	1.89
Benzo [g,h,i] perylene	0.02 ug/g dry	0.13	0.16	0.57	1.08
Benzo [k] fluoranthene	0.02 ug/g dry	0.09	0.11	0.35	0.61
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.20	0.25	0.90	1.50
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.03	0.03	0.15	0.28
Fluoranthene	0.02 ug/g dry	0.35	0.22	1.81	3.42
Fluorene	0.02 ug/g dry	0.03	<0.02	0.08	0.24
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.10	0.11	0.53	0.98
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.06
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	0.03	0.07
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	0.12
Naphthalene	0.01 ug/g dry	0.02	0.01	0.07	0.10
Phenanthrene	0.02 ug/g dry	0.22	0.23	0.94	2.23
Pyrene	0.02 ug/g dry	0.31	0.19	1.46	0.94
2-Fluorobiphenyl	Surrogate	62.2%	120%	26.3% [3]	63.8%

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP13-1	TP14-1	TP15-1	TP18-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-01	1330254-02	1330254-03	1330254-04
	MDL/Units	Soil	Soil	Soil	Soil
Terphenyl-d14	Surrogate	53.0%	32.3% [2]	56.4%	27.3% [2]

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Client ID:	TP17-1	TP16-1	TP19-1	TP20-1
Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID:	1330254-05	1330254-06	1330254-07	1330254-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	89.7	87.6	87.2	84.5
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	11.4	4.2	4.7	5.2
Barium	1.0 ug/g dry	103	152	122	279
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	7.6	5.1	4.3	5.7
Boron, available	0.5 ug/g dry	0.5	<0.5	<0.5	0.8
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	11.3	13.4	13.0	16.9
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	5.3	5.0	4.7	6.1
Copper	1.0 ug/g dry	15.5	17.7	27.8	22.0
Lead	1.0 ug/g dry	44.7	49.0	120	183
Mercury	0.1 ug/g dry	0.1	0.2	0.5	0.4
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	11.2	9.8	10.1	11.4
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	0.7	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	13.9	19.3	18.7	26.4
Zinc	1.0 ug/g dry	43.2	52.7	114	176

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP17-1	TP16-1	TP19-1	TP20-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-05	1330254-06	1330254-07	1330254-08
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP17-1	TP16-1	TP19-1	TP20-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-05	1330254-06	1330254-07	1330254-08
	MDL/Units	Soil	Soil	Soil	Soil
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	102%	102%	102%	102%
Dibromofluoromethane	Surrogate	104%	102%	101%	102%
Toluene-d8	Surrogate	106%	107%	106%	105%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	13	<4
F3 PHCs (C16-C34)	8 ug/g dry	27	57	68	29
F4 PHCs (C34-C50)	6 ug/g dry	<6	9	13	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.20	0.18	0.24	0.09
Acenaphthylene	0.02 ug/g dry	0.57	0.34	0.74	1.25
Anthracene	0.02 ug/g dry	2.15	1.02	1.30	1.19
Benzo [a] anthracene	0.02 ug/g dry	2.53	1.19	3.44	1.88
Benzo [a] pyrene	0.02 ug/g dry	2.07	1.22	3.48	1.89
Benzo [b] fluoranthene	0.02 ug/g dry	2.22	1.85	5.65	2.06
Benzo [g,h,i] perylene	0.02 ug/g dry	1.03	0.66	2.41	0.64
Benzo [k] fluoranthene	0.02 ug/g dry	0.68	0.73	3.36	0.71
Biphenyl	0.02 ug/g dry	0.05	0.04	0.04	0.03
Chrysene	0.02 ug/g dry	2.28	1.26	3.49	1.75
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.21	0.18	0.68	0.19
Fluoranthene	0.02 ug/g dry	3.28	2.66	6.01	5.74
Fluorene	0.02 ug/g dry	0.67	0.40	0.35	0.35
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	1.00	0.61	2.30	0.64
1-Methylnaphthalene	0.02 ug/g dry	0.05	0.09	0.21	0.06
2-Methylnaphthalene	0.02 ug/g dry	0.05	0.11	0.26	0.06
Methylnaphthalene (1&2)	0.04 ug/g dry	0.10	0.20	0.47	0.11
Naphthalene	0.01 ug/g dry	0.15	0.32	0.23	0.11
Phenanthrene	0.02 ug/g dry	5.31	2.66	3.29	2.95

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Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP17-1	TP16-1	TP19-1	TP20-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-05	1330254-06	1330254-07	1330254-08
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	2.57	2.45	5.62	4.46
2-Fluorobiphenyl	Surrogate	8.65% [3]	70.8%	114%	51.3%
Terphenyl-d14	Surrogate	34.1% [2]	71.6%	85.1%	38.3% [2]

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Client ID:	TP21-1	TP23-1	TP30-1	TP26-1
Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
Sample ID:	1330254-09	1330254-10	1330254-11	1330254-12
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	92.2	94.0	87.7	95.3
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Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	9.7	2.6	<1.0	1.1
Barium	1.0 ug/g dry	223	104	119	142
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	5.4	5.5	2.6	3.3
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	10.9	5.9	12.8	4.1
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	5.1	2.7	4.4	1.9
Copper	1.0 ug/g dry	37.8	5.0	9.2	4.3
Lead	1.0 ug/g dry	334	13.0	6.6	8.3
Mercury	0.1 ug/g dry	0.2	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	1.1	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	11.4	5.9	7.3	4.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	16.5	6.5	21.5	5.5
Zinc	1.0 ug/g dry	98.2	12.8	20.3	7.5

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

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Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP21-1	TP23-1	TP30-1	TP26-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-09	1330254-10	1330254-11	1330254-12
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP21-1	TP23-1	TP30-1	TP26-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-09	1330254-10	1330254-11	1330254-12
	MDL/Units	Soil	Soil	Soil	Soil
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	101%	101%	101%	102%
Dibromofluoromethane	Surrogate	102%	102%	103%	101%
Toluene-d8	Surrogate	106%	105%	105%	104%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	17
F3 PHCs (C16-C34)	8 ug/g dry	64	<8	20	1270
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	21	140

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.92	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	10.2	<0.02	0.41	<0.02
Anthracene	0.02 ug/g dry	10.9	<0.02	0.48	<0.02
Benzo [a] anthracene	0.02 ug/g dry	24.6	0.03	0.77	0.04
Benzo [a] pyrene	0.02 ug/g dry	20.0	0.02	0.70	0.03
Benzo [b] fluoranthene	0.02 ug/g dry	18.2	0.03	1.15	0.05
Benzo [g,h,i] perylene	0.02 ug/g dry	8.84	<0.02	0.20	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	7.29	<0.02	0.38	<0.02
Biphenyl	0.02 ug/g dry	0.41	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	22.0	0.03	0.66	0.04
Dibenzo [a,h] anthracene	0.02 ug/g dry	2.75	<0.02	0.05	<0.02
Fluoranthene	0.02 ug/g dry	47.3	0.04	1.34	0.06
Fluorene	0.02 ug/g dry	6.94	<0.02	0.08	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	8.92	<0.02	0.19	<0.02
1-Methylnaphthalene	0.02 ug/g dry	0.61	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	0.64	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	1.25	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	0.92	<0.01	0.02	<0.01
Phenanthrene	0.02 ug/g dry	45.0	0.03	0.71	0.04
Pyrene	0.02 ug/g dry	35.8	0.04	1.12	0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

		Client ID: Sample Date: Sample ID:	TP21-1 24-Jul-13 1330254-09 Soil	TP23-1 24-Jul-13 1330254-10 Soil	TP30-1 24-Jul-13 1330254-11 Soil	TP26-1 24-Jul-13 1330254-12 Soil
	MDL/Units					
2-Fluorobiphenyl	Surrogate		87.6%	25.4% [3]	54.5%	78.3%
Terphenyl-d14	Surrogate		64.9%	43.4% [2]	44.9% [2]	43.9% [2]

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP25-1	TP29-1	TP27-1	TP28-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-13	1330254-14	1330254-15	1330254-16
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	84.8	91.8	83.8	88.4
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.3	2.4	3.8	1.9
Barium	1.0 ug/g dry	103	117	220	78.9
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	1.7	3.4	4.9	2.5
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	14.3	7.5	13.5	10.6
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	3.7	2.9	3.8	3.6
Copper	1.0 ug/g dry	6.6	9.6	21.3	12.3
Lead	1.0 ug/g dry	10.3	24.7	354	13.4
Mercury	0.1 ug/g dry	<0.1	0.6	0.6	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	1.0 ug/g dry	7.3	6.6	8.0	6.6
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	21.1	11.5	18.1	18.1
Zinc	1.0 ug/g dry	26.5	23.0	165	23.3
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP25-1	TP29-1	TP27-1	TP28-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-13	1330254-14	1330254-15	1330254-16
	MDL/Units	Soil	Soil	Soil	Soil
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID: Sample Date: Sample ID:	TP25-1	TP29-1	TP27-1	TP28-1
		24-Jul-13 1330254-13	24-Jul-13 1330254-14	24-Jul-13 1330254-15	24-Jul-13 1330254-16
	MDL/Units	Soil	Soil	Soil	Soil
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	94.3%	99.5%	100%	101%
Dibromofluoromethane	Surrogate	101%	102%	103%	102%
Toluene-d8	Surrogate	103%	108%	105%	105%

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	38	66	466	<8
F4 PHCs (C34-C50)	6 ug/g dry	12	122	63	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	0.99	<0.02
Acenaphthylene	0.02 ug/g dry	0.02	0.02	1.98	0.05
Anthracene	0.02 ug/g dry	0.03	0.03	4.46	0.07
Benzo [a] anthracene	0.02 ug/g dry	0.07	0.07	9.04	0.16
Benzo [a] pyrene	0.02 ug/g dry	0.06	0.06	6.85	0.15
Benzo [b] fluoranthene	0.02 ug/g dry	0.07	0.10	10.1	0.15
Benzo [g,h,i] perylene	0.02 ug/g dry	0.03	0.04	3.89	0.10
Benzo [k] fluoranthene	0.02 ug/g dry	0.03	0.03	3.57	0.05
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.40 [1]	<0.02
Chrysene	0.02 ug/g dry	0.07	0.11	8.88	0.16
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	1.07	<0.02
Fluoranthene	0.02 ug/g dry	0.12	0.08	17.2	0.26
Fluorene	0.02 ug/g dry	<0.02	<0.02	1.92	0.03
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.03	0.03	3.42	0.10
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.40 [1]	0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	0.41	0.04
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.80 [1]	0.06
Naphthalene	0.01 ug/g dry	<0.01	<0.01	0.97	0.01
Phenanthrene	0.02 ug/g dry	0.05	0.06	14.1	0.17

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Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP25-1	TP29-1	TP27-1	TP28-1
	Sample Date:	24-Jul-13	24-Jul-13	24-Jul-13	24-Jul-13
	Sample ID:	1330254-13	1330254-14	1330254-15	1330254-16
	MDL/Units	Soil	Soil	Soil	Soil
Pyrene	0.02 ug/g dry	0.11	0.07	14.5	0.24
2-Fluorobiphenyl	Surrogate	86.4%	79.0%	73.2%	39.8% [3]
Terphenyl-d14	Surrogate	51.4%	46.0% [2]	78.5%	50.3%

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Client ID:	TP24-1	-	-	-
Sample Date:	24-Jul-13	-	-	-
Sample ID:	1330254-17	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	89.4	-	-	-
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Metals

Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	2.8	-	-	-
Barium	1.0 ug/g dry	181	-	-	-
Beryllium	1.0 ug/g dry	<1.0	-	-	-
Boron	1.0 ug/g dry	3.6	-	-	-
Boron, available	0.5 ug/g dry	<0.5	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	1.0 ug/g dry	15.0	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	4.9	-	-	-
Copper	1.0 ug/g dry	28.6	-	-	-
Lead	1.0 ug/g dry	187	-	-	-
Mercury	0.1 ug/g dry	0.6	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	1.0 ug/g dry	8.9	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.5 ug/g dry	<0.5	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	1.0 ug/g dry	23.2	-	-	-
Zinc	1.0 ug/g dry	109	-	-	-

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	-	-	-
Chloroethane	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	MDL/Units	Client ID: Sample Date: Sample ID:	TP24-1 24-Jul-13 1330254-17	-	-	-
		Soil	-	-	-	-
Chloromethane	0.20 ug/g dry	<0.20	-	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-	-
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)	0.50 ug/g dry	<0.50	-	-	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	-	-	-	-
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	-	-	-	-
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	-	-	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP24-1	-	-	-
	Sample Date:	24-Jul-13	-	-	-
	Sample ID:	1330254-17	-	-	-
	MDL/Units	Soil	-	-	-
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	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	101%	-	-	-
Dibromofluoromethane	Surrogate	103%	-	-	-
Toluene-d8	Surrogate	105%	-	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	38	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	10	-	-	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.03	-	-	-
Acenaphthylene	0.02 ug/g dry	0.51	-	-	-
Anthracene	0.02 ug/g dry	0.46	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.81	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.84	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.75	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.48	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.28	-	-	-
Biphenyl	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	0.88	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.14	-	-	-
Fluoranthene	0.02 ug/g dry	1.65	-	-	-
Fluorene	0.02 ug/g dry	0.08	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.48	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	-	-	-
Naphthalene	0.01 ug/g dry	0.03	-	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 24-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	TP24-1	-	-	-
	Sample Date:	24-Jul-13	-	-	-
	Sample ID:	1330254-17	-	-	-
	MDL/Units	Soil	-	-	-
Phenanthrene	0.02 ug/g dry	0.84	-	-	-
Pyrene	0.02 ug/g dry	1.39	-	-	-
2-Fluorobiphenyl	Surrogate	77.8%	-	-	-
Terphenyl-d14	Surrogate	51.7%	-	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.739		ug/g		55.4	50-140			
Surrogate: Terphenyl-d14	0.886		ug/g		66.4	50-140			
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						

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	3.26		ug/g		102	50-140			
Surrogate: Dibromofluoromethane	1.84		ug/g		57.4	50-140			
Surrogate: Toluene-d8	3.08		ug/g		96.2	50-140			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	2.44	1.0	ug/g dry	3.08			23.2	30	
Barium	160	10.0	ug/g dry	155			3.2	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	12.8	1.0	ug/g dry	11.3			12.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.8	1.0	ug/g dry	14.0			1.1	30	
Cobalt	7.44	1.0	ug/g dry	6.96			6.6	30	
Copper	18.3	1.0	ug/g dry	21.1			13.8	30	
Lead	25.9	1.0	ug/g dry	24.9			3.9	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	13.7	1.0	ug/g dry	14.0			2.1	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	5.13	1.0	ug/g dry	5.20			1.3	30	
Vanadium	11.3	1.0	ug/g dry	11.1			2.0	30	
Zinc	25.8	1.0	ug/g dry	26.3			2.1	30	
Physical Characteristics									
% Solids	85.0	0.1	% by Wt.	85.4			0.4	25	
Semi-Volatiles									
Acenaphthene	0.036	0.02	ug/g dry	ND			0.0	40	
Acenaphthylene	0.115	0.02	ug/g dry	0.074			43.2	40	QR-04
Anthracene	0.200	0.02	ug/g dry	0.104			63.3	40	QR-04
Benzo [a] anthracene	0.504	0.02	ug/g dry	0.207			83.4	40	QR-04
Benzo [a] pyrene	0.552	0.02	ug/g dry	0.204			92.2	40	QR-04
Benzo [b] fluoranthene	0.583	0.02	ug/g dry	0.240			83.5	40	QR-04
Benzo [g,h,i] perylene	0.336	0.02	ug/g dry	0.126			90.9	40	QR-04
Benzo [k] fluoranthene	0.217	0.02	ug/g dry	0.087			85.7	40	QR-04
Biphenyl	ND	0.02	ug/g dry	ND			0.0	40	
Chrysene	0.540	0.02	ug/g dry	0.204			90.3	40	QR-04
Dibenzo [a,h] anthracene	0.076	0.02	ug/g dry	0.028			92.3	40	QR-04
Fluoranthene	0.998	0.02	ug/g dry	0.346			96.9	40	QR-04
Fluorene	0.046	0.02	ug/g dry	0.027			54.4	40	QR-04
Indeno [1,2,3-cd] pyrene	0.271	0.02	ug/g dry	0.096			95.4	40	QR-04
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			0.0	40	
2-Methylnaphthalene	0.024	0.02	ug/g dry	ND			0.0	40	
Naphthalene	0.094	0.01	ug/g dry	0.015			145.0	40	QR-04
Phenanthrene	0.535	0.02	ug/g dry	0.224			81.9	40	QR-04
Pyrene	0.806	0.02	ug/g dry	0.311			88.8	40	QR-04
Surrogate: 2-Fluorobiphenyl	1.15		ug/g dry	ND	73.4	50-140			
Surrogate: Terphenyl-d14	1.15		ug/g dry	ND	73.8	50-140			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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	
1,2,4-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	2.60		ug/g dry	ND	104	50-140			
Surrogate: Dibromofluoromethane	1.56		ug/g dry	ND	62.6	50-140			
Surrogate: Toluene-d8	2.18		ug/g dry	ND	87.2	50-140			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	199	7	ug/g	ND	99.7	80-120			
F2 PHCs (C10-C16)	62	4	ug/g	ND	62.2	60-140			
F3 PHCs (C16-C34)	144	8	ug/g	ND	69.6	60-140			
F4 PHCs (C34-C50)	85	6	ug/g	ND	61.3	60-140			
Metals									
Antimony	226		ug/L	2.24	89.4	70-130			
Arsenic	250		ug/L	61.5	75.4	70-130			
Barium	458		ug/L	ND	91.6	70-130			
Beryllium	204		ug/L	6.96	78.9	70-130			
Boron, available	3.52	0.5	ug/g	ND	70.5	70-122			
Boron	450		ug/L	227	89.3	70-130			
Cadmium	192		ug/L	0.77	76.4	70-130			
Chromium (VI)	4.6	0.2	ug/g	ND	93.0	70-130			
Chromium	477		ug/L	280	78.7	70-130			
Cobalt	313		ug/L	139	69.3	70-130			QM-07
Copper	629		ug/L	421	82.9	70-130			
Lead	737		ug/L	499	95.4	70-130			
Mercury	1.68	0.1	ug/g	ND	112	72-128			
Molybdenum	186		ug/L	6.03	72.1	70-130			
Nickel	458		ug/L	281	71.0	70-130			
Selenium	179		ug/L	ND	83.3	70-130			
Silver	177		ug/L	0.20	70.7	70-130			
Thallium	188		ug/L	11.6	70.7	70-130			
Uranium	285		ug/L	104	72.4	70-130			
Vanadium	419		ug/L	221	79.2	70-130			
Zinc	718		ug/L	526	76.6	70-130			
Semi-Volatiles									
Acenaphthene	0.164	0.02	ug/g	ND	84.1	50-140			
Acenaphthylene	0.183	0.02	ug/g	0.074	55.9	50-140			
Anthracene	0.275	0.02	ug/g	0.104	87.5	50-140			
Benzo [a] anthracene	0.462	0.02	ug/g	0.207	131	50-140			
Benzo [a] pyrene	0.355	0.02	ug/g	0.204	77.8	50-140			
Benzo [b] fluoranthene	0.537	0.02	ug/g	0.240	153	50-140			QM-06
Benzo [g,h,i] perylene	0.258	0.02	ug/g	0.126	67.5	50-140			
Benzo [k] fluoranthene	0.351	0.02	ug/g	0.087	135	50-140			
Biphenyl	0.108	0.02	ug/g	ND	55.1	50-140			
Chrysene	0.492	0.02	ug/g	0.204	148	50-140			QM-06
Dibenzo [a,h] anthracene	0.169	0.02	ug/g	0.028	72.2	50-140			
Fluoranthene	0.475	0.02	ug/g	0.346	65.8	50-140			
Fluorene	0.196	0.02	ug/g	0.027	86.9	50-140			
Indeno [1,2,3-cd] pyrene	0.255	0.02	ug/g	0.096	81.5	50-140			
1-Methylnaphthalene	0.098	0.02	ug/g	ND	50.0	50-140			
2-Methylnaphthalene	0.142	0.02	ug/g	ND	72.9	50-140			
Naphthalene	0.123	0.01	ug/g	0.015	55.3	50-140			
Phenanthrene	0.390	0.02	ug/g	0.224	85.3	50-140			
Pyrene	0.485	0.02	ug/g	0.311	89.3	50-140			
Surrogate: 2-Fluorobiphenyl	0.936		ug/g		59.9	50-140			

Volatiles

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	7.93	0.50	ug/g	ND	79.3	50-140			
Benzene	4.15	0.02	ug/g	ND	104	60-130			
Bromodichloromethane	3.43	0.05	ug/g	ND	85.6	60-130			
Bromoform	2.48	0.05	ug/g	ND	62.0	60-130			
Bromomethane	4.43	0.05	ug/g	ND	111	50-140			
Carbon Tetrachloride	3.10	0.05	ug/g	ND	77.4	60-130			
Chlorobenzene	4.18	0.05	ug/g	ND	105	60-130			
Chloroethane	3.49	0.05	ug/g	ND	87.3	50-140			
Chloroform	4.10	0.05	ug/g	ND	103	60-130			
Chloromethane	2.96	0.20	ug/g	ND	74.0	50-140			
Dibromochloromethane	3.19	0.05	ug/g	ND	79.8	60-130			
Dichlorodifluoromethane	4.37	0.05	ug/g	ND	109	50-140			
1,2-Dibromoethane	3.92	0.05	ug/g	ND	98.1	60-130			
1,2-Dichlorobenzene	3.72	0.05	ug/g	ND	93.1	60-130			
1,3-Dichlorobenzene	3.85	0.05	ug/g	ND	96.4	60-130			
1,4-Dichlorobenzene	3.33	0.05	ug/g	ND	83.3	60-130			
1,1-Dichloroethane	2.98	0.05	ug/g	ND	74.4	60-130			
1,2-Dichloroethane	4.21	0.05	ug/g	ND	105	60-130			
1,1-Dichloroethylene	3.16	0.05	ug/g	ND	78.9	60-130			
cis-1,2-Dichloroethylene	4.63	0.05	ug/g	ND	116	60-130			
trans-1,2-Dichloroethylene	3.22	0.05	ug/g	ND	80.6	60-130			
1,2-Dichloropropane	3.63	0.05	ug/g	ND	90.7	60-130			
cis-1,3-Dichloropropylene	2.97	0.05	ug/g	ND	74.3	60-130			
trans-1,3-Dichloropropylene	2.45	0.05	ug/g	ND	61.4	60-130			
Ethylbenzene	4.30	0.05	ug/g	ND	107	60-130			
Hexane	5.02	0.05	ug/g	ND	126	60-130			
Methyl Ethyl Ketone (2-Butanone)	7.28	0.50	ug/g	ND	72.8	50-140			
Methyl Butyl Ketone (2-Hexanone)	5.58	2.00	ug/g	ND	55.8	50-140			
Methyl Isobutyl Ketone	8.61	0.50	ug/g	ND	86.1	50-140			
Methyl tert-butyl ether	7.04	0.05	ug/g	ND	70.4	50-140			
Methylene Chloride	3.84	0.05	ug/g	ND	96.0	60-130			
Styrene	4.19	0.05	ug/g	ND	105	60-130			
1,1,1,2-Tetrachloroethane	3.29	0.05	ug/g	ND	82.3	60-130			
1,1,2,2-Tetrachloroethane	3.83	0.05	ug/g	ND	95.7	60-130			
Tetrachloroethylene	4.09	0.05	ug/g	ND	102	60-130			
Toluene	4.44	0.05	ug/g	ND	111	60-130			
1,2,4-Trichlorobenzene	3.44	0.05	ug/g	ND	85.9	60-130			
1,1,1-Trichloroethane	3.10	0.05	ug/g	ND	77.6	60-130			
1,1,2-Trichloroethane	3.63	0.05	ug/g	ND	90.9	60-130			
Trichloroethylene	3.55	0.05	ug/g	ND	88.8	60-130			
Trichlorofluoromethane	2.76	0.05	ug/g	ND	69.0	50-140			
1,3,5-Trimethylbenzene	4.11	0.05	ug/g	ND	103	60-130			
Vinyl chloride	2.86	0.02	ug/g	ND	71.5	50-140			
m,p-Xylenes	7.78	0.05	ug/g	ND	97.3	60-130			
o-Xylene	4.19	0.05	ug/g	ND	105	60-130			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Qualifier Notes:

Sample Qualifiers :

- 1 : Elevated detection limit due to dilution required because of high target analyte concentration.
- 2 : PAH surrogate recovery (p-terphenyl-d14) lower than expected due to matrix interference.
- 3 : PAH surrogate recovery (2-Fluorobiphenyl) lower than expected due to matrix interference.

QC Qualifiers :

- QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.
- QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.
- QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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



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Chain of Custody
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Page 1 of 2

Client Name: Stantec Consulting Ltd.	Project Reference: 122510670.220	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: Jill Peters-Dechman	Quote # City Of Ottawa SOA 19609-91843-S01	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: 1331 Clyde Avenue Suite 400 Ottawa, ON K2C3G4	PO #	Date Required: _____
Telephone: 613-722-4420	Email Address: jill.peters-dechman@stantec.com	

Criteria: O. Reg. 153 (As Amended) Table 1 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: 1330254			Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCS	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCBs	FOC	EC/SAR	pH					
Sample ID/Location Name		Date				Time																	
1	TP 13-1	BA1440	s		2	↑	Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2	TP 14-1	BA1441	s			↑		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	TP 15-1	BA1442	s					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	TP 18-1	BA1443	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	TP 17-1	BA1444	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	TP 16-1	BA1445	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	TP 19-1	BA1446	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	TP 20-1	BA1447	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	TP 21-1	BA1448	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	TP 23-1	BA1449	s			↓		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

35 ml vial

Comments: _____ Method of Delivery: Walk-in

Relinquished By (Sign): <i>A. Waldich</i>	Received by Driver/Depot:	Received at Lab: <i>M/C</i>	Verified By: <i>M/C</i>
Relinquished By (Print): A. Waldich	Date/Time:	Date/Time: July 24/18 6:23	Date/Time: July 24/13 4:38
Date/Time: 2013/07/24	Temperature: _____ °C	Temperature: 18.0 °C	pH Verified [] By: N/A



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Page 2 of 2

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Client Name: Stantec Consulting Ltd.
Contact Name: Jill Peters-Dechman
Address: 1331 Clyde Avenue Suite 400
Ottawa, ON K2C3G4
Telephone: 613-722-4420

Project Reference: 122510670.220
Quote #: City Of Ottawa SOA 19609-91843-S01
PO #
Email Address: jill.peters-dechman@stantec.com

TAT: Regular 3 Day
 2 Day 1 Day
Date Required: _____

Criteria: O. Reg. 153 (As Amended) Table 1 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: 1330254			Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCBs	FOC	EC/SAR	pH					
Sample ID/Location Name						Date	Time																
1	TP 30-1	BA1450	s		2																		
2	TP 26-1	BA1451	s																				
3	TP 25-1	BA1452	s																				
4	TP 29-1	BA1453	s																				
5	TP 27-1	BA1454	s																				
6	TP 28-1	BA1455	s																				
7	TP 24-1	BA1456	s																				
8			s																				
9			s																				
10			s																				

Comments: _____ Method of Delivery: Walk-in

Relinquished By (Sign): <i>A. Waldich</i>	Received by Driver/Depot:	Received at Lab: <i>M/C</i>	Verified By: <i>M/C</i>
Relinquished By (Print): A. Waldich	Date/Time:	Date/Time: July 24/13 6:23	Date/Time: July 24/13 4:38
Date/Time: 2013/07/24	Temperature: _____ °C	Temperature: 19.1 °C	pH Verified [] By: N/A

Sample Submission Deficiency Form

Client:	Stantec Consulting		Date:	July 25/13	
Contact:	Jill Peters - Dechman / Alison Waldick		COC #		
Project:	122510670.220 (City of Ottawa)	REGULATED:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	CSR:	Mary-Jane
Issue:	<input type="checkbox"/> COC <input checked="" type="checkbox"/> SAMPLE <input type="checkbox"/> OTHER	REG:	153 Table 1		

Client Sample ID	Problem	Resolution	Initial
TP24-1	- not listed on COC	- add to COC per Allison - -myc	myc

Client Notified by Telephone (Date/Time): July 25/13 12:25pm

Comments: _____

Client must initial samples, sign and return form to lab prior to any work commencing on samples listed on this form.

Client Authorization Signature: _____ DATE: _____

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.225/ Boteler
Custody:

Report Date: 1-Apr-2014
Order Date: 1-Apr-2014

Order #: 1414092

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

Paracel ID	Client ID
1414092-01	BH14-4 SS2
1414092-02	BH14-5 SS1
1414092-03	BH14-6 SS1

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 01-Apr-2014

Order Date: 1-Apr-2014

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PAHs by GC-MS	EPA 625 - GC-MS, extraction	11-Mar-14	11-Mar-14

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NIAGARA FALLS
5415 Morning Glory Crt.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 01-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 1-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

	Client ID:	BH14-4 SS2	BH14-5 SS1	BH14-6 SS1	-
	Sample Date:	05-Mar-14	05-Mar-14	05-Mar-14	-
	Sample ID:	1414092-01	1414092-02	1414092-03	-
	MDL/Units	Leachate	Leachate	Leachate	-

Semi-Volatiles

	MDL/Units	BH14-4 SS2	BH14-5 SS1	BH14-6 SS1	-
Acenaphthene	0.05 ug/L	15.8 [1]	<0.50 [1]	<0.50 [1]	-
Acenaphthylene	0.05 ug/L	37.5 [1]	<0.50 [1]	<0.50 [1]	-
Anthracene	0.01 ug/L	11.5 [1]	<0.10 [1]	<0.10 [1]	-
Benzo [a] anthracene	0.01 ug/L	0.46 [1]	<0.10 [1]	<0.10 [1]	-
Benzo [a] pyrene	0.01 ug/L	<0.10 [1]	<0.10 [1]	<0.10 [1]	-
Benzo [b] fluoranthene	0.05 ug/L	<0.50 [1]	<0.50 [1]	<0.50 [1]	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.50 [1]	<0.50 [1]	<0.50 [1]	-
Benzo [k] fluoranthene	0.05 ug/L	<0.50 [1]	<0.50 [1]	<0.50 [1]	-
Biphenyl	0.05 ug/L	14.0 [1]	<0.50 [1]	<0.50 [1]	-
Chrysene	0.05 ug/L	<0.50 [1]	<0.50 [1]	<0.50 [1]	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.50 [1]	<0.50 [1]	<0.50 [1]	-
Fluoranthene	0.01 ug/L	14.5 [1]	<0.10 [1]	<0.10 [1]	-
Fluorene	0.05 ug/L	71.2 [1]	<0.50 [1]	<0.50 [1]	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.50 [1]	<0.50 [1]	<0.50 [1]	-
1-Methylnaphthalene	0.05 ug/L	30.7 [1]	<0.50 [1]	<0.50 [1]	-
2-Methylnaphthalene	0.05 ug/L	25.7 [1]	<0.50 [1]	<0.50 [1]	-
Methylnaphthalene (1&2)	0.10 ug/L	56.4 [1]	<1.00 [1]	<1.00 [1]	-
Naphthalene	0.05 ug/L	53.5 [1]	<0.50 [1]	<0.50 [1]	-
Phenanthrene	0.05 ug/L	79.5 [1]	<0.50 [1]	<0.50 [1]	-
Pyrene	0.01 ug/L	7.10 [1]	<0.10 [1]	<0.10 [1]	-
2-Fluorobiphenyl	Surrogate	77.5% [1]	104% [1]	74.3% [1]	-
Terphenyl-d14	Surrogate	61.0% [1]	97.8% [1]	77.9% [1]	-

Certificate of Analysis

Report Date: 01-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 1-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	12.7		ug/L		63.3	50-140			
Surrogate: Terphenyl-d14	13.7		ug/L		68.5	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Report Date: 01-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Order Date: 1-Apr-2014

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	3.71	0.05	ug/L	ND	74.2	50-140			
Acenaphthylene	4.85	0.05	ug/L	ND	97.0	50-140			
Anthracene	3.79	0.01	ug/L	ND	75.8	50-140			
Benzo [a] anthracene	3.64	0.01	ug/L	ND	72.8	50-140			
Benzo [a] pyrene	3.69	0.01	ug/L	ND	73.8	50-140			
Benzo [b] fluoranthene	5.13	0.05	ug/L	ND	103	50-140			
Benzo [g,h,i] perylene	4.82	0.05	ug/L	ND	96.5	50-140			
Benzo [k] fluoranthene	5.77	0.05	ug/L	ND	115	50-140			
Biphenyl	4.79	0.05	ug/L	ND	95.7	50-140			
Chrysene	4.02	0.05	ug/L	ND	80.4	50-140			
Dibenzo [a,h] anthracene	4.97	0.05	ug/L	ND	99.4	50-140			
Fluoranthene	4.38	0.01	ug/L	ND	87.6	50-140			
Fluorene	3.53	0.05	ug/L	ND	70.5	50-140			
Indeno [1,2,3-cd] pyrene	4.71	0.05	ug/L	ND	94.2	50-140			
1-Methylnaphthalene	3.01	0.05	ug/L	ND	60.2	50-140			
2-Methylnaphthalene	4.22	0.05	ug/L	ND	84.5	50-140			
Naphthalene	3.56	0.05	ug/L	ND	71.3	50-140			
Phenanthrene	4.07	0.05	ug/L	ND	81.5	50-140			
Pyrene	3.56	0.01	ug/L	ND	71.1	50-140			
Surrogate: 2-Fluorobiphenyl	13.1		ug/L		65.7	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 01-Apr-2014

Order Date: 1-Apr-2014

Qualifier Notes:

Sample Qualifiers :

1 : Results are based on TCLP extraction of soil material followed by GC-MS analysis. Detection limits have been raised due to the prep ratio used on the TCLP extract.

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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No 15710

Page 1 of 1

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Client Name: <u>Stantec Consulting Ltd.</u>	Project Reference: <u>122510170</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day Date Required: _____
Contact Name: <u>Jill Peters - Dechman</u>	Quote # <u>City of Ottawa SOA - 01910-41843 - 501</u>	
Address: <u>Suite 400, 1351 Clyde Avenue Ottawa, ON K2C 0G5</u>	PO # <u>122510170, 225</u>	
Telephone: <u>453-722-4420</u>	Email Address: <u>jill.peters-dechman@stantec.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 1 | RSC Filings | O. Reg. 358/00 | PWOQ | 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

Parcel Order Number: <u>1414092</u> <u>4110305</u>		Matrix	Air Volume	# of Containers	Sample Taken		TCLP PAMS	Required Analyses
Sample ID/Location Name					Date	Time		
1	BH14-4 SS2 BCF165	Soil	Y	2	2-14-13/05	16:30	✓	→ report full PAMS from leachate extraction Per Jill. 2 x 120ml
2	BH14-5 SS1 BCF165	Soil	X	2	2-14-13/05	15:30	✓	
3	BH14-6 SS1 BCF167	Soil	X	2	2-14-13/05	16:00	✓	
4								
5								
6								
7								
8								
9								
10								

Comments: - any questions, please contact Jill Peters - Dechman, Stantec.

[Signature]
April 1, 2014 1:16pm

Method of Delivery

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depo:	Received at Lab: <i>[Signature]</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <u>J. Wilson</u>	Date/Time: _____	Date/Time: <u>Mar 7/14 5:44</u>	Date/Time: <u>Mar 7/14 5:51</u>
Date/Time: <u>2014/03/07 17:40</u>	Temperature: _____ °C	Temperature: <u>10 °C</u>	pH Verified By: <u>NA</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.215/ Boteler Street
Custody: 11936

Report Date: 3-Sep-2013
Order Date: 29-Aug-2013

Order #: 1335238

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

Paracel ID	Client ID
1335238-01	TP5-1
1335238-02	TP11-1
1335238-03	TP16-1
1335238-04	TP25-1
1335238-05	TP30-1

Approved By:



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

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

Certificate of Analysis

Report Date: 03-Sep-2013

Order Date: 29-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler Street

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
pH	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	3-Sep-13	3-Sep-13

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'.

Certificate of Analysis

Report Date: 03-Sep-2013

Order Date: 29-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler Street

Sample Results

pH				Matrix: Soil
				Sample Date: 29-Aug-13
Parcel ID	Client ID	Units	MDL	Result
1335238-01	TP5-1	pH Units	0.05	7.70
1335238-02	TP11-1	pH Units	0.05	7.65
1335238-03	TP16-1	pH Units	0.05	7.74
1335238-04	TP25-1	pH Units	0.05	7.44
1335238-05	TP30-1	pH Units	0.05	7.80

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Matrix Duplicate									
pH	7.25	0.05	pH Units	7.29			0.6	10	
Matrix Spike				ND					

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Page 1 of 1

Client Name: <u>Stantec Ottawa</u>	Project Reference: <u>122510670.215</u>	TAT: <input checked="" type="checkbox"/> Regular [] 3 Day <input type="checkbox"/> 2 Day [] 1 Day
Contact Name: <u>Jill Peters - Dechman</u>	Quote # <u>City of Ottawa S0A</u>	
Address: <u>1331 Clyde Ave, Suite 400 Ottawa</u>	PO #	
Telephone: <u>613-722-4420</u>	Email Address: <u>Jill.peters-dechman@stantec.com</u>	Date Required _____

Criteria: O. Reg. 153/04 (As Amended) Table S [] 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: <u>1335238</u>		Matrix	Air Volume	# of Containers	Sample Taken		pH	Required Analyses														
Sample ID/Location Name					Date	Time																
1	<u>TP 5-1 BAI 641</u>	<u>S</u>		<u>1</u>	<u>↑</u>	<u>16:00</u>	<u>X</u>															<u>120 ml</u>
2	<u>TP 11-1 BAI 642</u>	<u>↓</u>		<u>↓</u>	<u>20/3/08</u>	<u>↓</u>	<u>X</u>															<u>↓</u>
3	<u>TP 16-1 BAI 643</u>	<u>↓</u>		<u>↓</u>	<u>08/29</u>	<u>↓</u>	<u>X</u>															<u>↓</u>
4	<u>TP 25-1 BAI 644</u>	<u>↓</u>		<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>															<u>↓</u>
5	<u>TP 30-1 BAI 645</u>	<u>↓</u>		<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>															<u>↓</u>
6																						
7																						
8																						
9																						
10																						

Comments: _____ Method of Delivery: Walk-in

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot:	Received at Lab: <u>MJC</u>	Verified By: <u>MJC</u>
Relinquished By (Print): <u>A. Waldick</u>	Date/Time:	Date/Time: <u>Aug 29/13 6:18</u>	Date/Time: <u>Aug 29/13 6:49</u>
Date/Time: <u>2013/08/29 18:18</u>	Temperature: _____ °C	Temperature: <u>14.4</u> °C	pH Verified By: <u>J N/A</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.215/ Boteler
Custody: 96653

Report Date: 9-Aug-2013
Order Date: 31-Jul-2013

Order #: 1331219

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

Parcel ID	Client ID
1331219-01	MW13-11
1331219-02	MW13-14
1331219-03	MW13-140
1331219-04	Trip Blank

Approved By:



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

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	8-Aug-13	8-Aug-13
Chromium, hexavalent	MOE E3056 - colourimetric	1-Aug-13	2-Aug-13
Cyanide, free	MOE E3015 - Auto Colour	9-Aug-13	9-Aug-13
Mercury	EPA 245.1 - Cold Vapour AA	1-Aug-13	1-Aug-13
Metals, ICP-MS	EPA 200.8 - ICP-MS	6-Aug-13	6-Aug-13
PAHs by GC-MS	EPA 625 - GC-MS, extraction	9-Aug-13	9-Aug-13
pH	EPA 150.1 - pH probe @25 °C	8-Aug-13	8-Aug-13
PHC F1	CWS Tier 1 - P&T GC-FID	3-Aug-13	4-Aug-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	6-Aug-13	7-Aug-13
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	3-Aug-13	8-Aug-13

P: 1-800-749-1947
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NIAGARA FALLS
5415 Morning Glory Cr.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 09-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Client ID:	MW13-11	MW13-14	MW13-140	Trip Blank
Sample Date:	31-Jul-13	31-Jul-13	31-Jul-13	31-Jul-13
Sample ID:	1331219-01	1331219-02	1331219-03	1331219-04
MDL/Units	Water	Water	Water	Water

General Inorganics

Parameter	MDL/Units	MW13-11	MW13-14	MW13-140	Trip Blank
Cyanide, free	2 ug/L	<2	<2	<2	-
pH	0.1 pH Units	7.2	7.0	7.0	-

Anions

Parameter	MDL/Units	MW13-11	MW13-14	MW13-140	Trip Blank
Chloride	1 mg/L	1590	1420	1470	-

Metals

Parameter	MDL/Units	MW13-11	MW13-14	MW13-140	Trip Blank
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	-
Antimony	0.5 ug/L	0.7	<0.5	<0.5	-
Arsenic	1 ug/L	<1	<1	<1	-
Barium	1 ug/L	72	71	71	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	-
Boron	10 ug/L	106	49	49	-
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	-
Chromium	1 ug/L	13	15	17	-
Chromium (VI)	10 ug/L	<10	<10	<10	-
Cobalt	0.5 ug/L	1.2	0.7	0.8	-
Copper	0.5 ug/L	3.7	1.2	1.2	-
Lead	0.1 ug/L	<0.1	<0.1	<0.1	-
Molybdenum	0.5 ug/L	6.6	4.3	4.3	-
Nickel	1 ug/L	15	7	7	-
Selenium	1 ug/L	<1	<1	<1	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	-
Sodium	200 ug/L	1090000	1060000	1070000	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	-
Uranium	0.1 ug/L	6.3	2.3	2.3	-
Vanadium	0.5 ug/L	8.0	9.8	8.9	-
Zinc	5 ug/L	25	<5	12	-

Volatiles

Parameter	MDL/Units	MW13-11	MW13-14	MW13-140	Trip Blank
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	1.0
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

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Certificate of Analysis

Report Date: 09-Aug-2013

Order Date: 31-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	MW13-11	MW13-14	MW13-140	Trip Blank
	Sample Date:	31-Jul-13	31-Jul-13	31-Jul-13	31-Jul-13
	Sample ID:	1331219-01	1331219-02	1331219-03	1331219-04
	MDL/Units	Water	Water	Water	Water
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	MW13-11	MW13-14	MW13-140	Trip Blank
	Sample Date:	31-Jul-13	31-Jul-13	31-Jul-13	31-Jul-13
	Sample ID:	1331219-01	1331219-02	1331219-03	1331219-04
	MDL/Units	Water	Water	Water	Water
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	116%	116%	127%	86.0%
Dibromofluoromethane	Surrogate	119%	115%	114%	120%
Toluene-d8	Surrogate	99.8%	99.5%	98.3%	91.8%

Hydrocarbons

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

Semi-Volatiles

Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	-
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	-
Anthracene	0.01 ug/L	0.03	<0.01	<0.01	-
Benzo [a] anthracene	0.01 ug/L	0.06	<0.01	<0.01	-
Benzo [a] pyrene	0.01 ug/L	0.03	<0.01	<0.01	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	-
Biphenyl	0.05 ug/L	<0.05	<0.05	<0.05	-
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	-
Fluoranthene	0.01 ug/L	0.07	<0.01	<0.01	-
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	-
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	-
Phenanthrene	0.05 ug/L	0.06	<0.05	<0.05	-

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	MW13-11	MW13-14	MW13-140	Trip Blank
	Sample Date:	31-Jul-13	31-Jul-13	31-Jul-13	31-Jul-13
	Sample ID:	1331219-01	1331219-02	1331219-03	1331219-04
	MDL/Units	Water	Water	Water	Water
Pyrene	0.01 ug/L	0.06	<0.01	<0.01	-
2-Fluorobiphenyl	Surrogate	119%	102%	121%	-
Terphenyl-d14	Surrogate	96.4%	73.8%	93.9%	-

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
General Inorganics									
Cyanide, free	ND	2	ug/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	19.8		ug/L		98.9	50-140			
Surrogate: Terphenyl-d14	20.8		ug/L		104	50-140			
Volatiles									

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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						
1,3,5-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	88.8		ug/L		111	50-140			
Surrogate: Dibromofluoromethane	81.6		ug/L		102	50-140			
Surrogate: Toluene-d8	76.9		ug/L		96.1	50-140			

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	1610	25	mg/L	1590			1.5	10	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND				20	
pH	7.8	0.1	pH Units	7.8			0.0	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
Antimony	1.33	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	ND	1	ug/L	ND			0.0	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	0.21	0.1	ug/L	0.18			13.5	20	
Chromium (VI)	ND	10	ug/L	ND				20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND			0.0	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	ND	0.5	ug/L	ND			0.0	20	
Nickel	ND	1	ug/L	ND			0.0	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	ND	200	ug/L	ND			0.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	ND	0.1	ug/L	ND			0.0	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	3.72	0.5	ug/L	3.71			0.3	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	8.07	0.5	ug/L	8.01			0.7	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	6.16	0.5	ug/L	6.08			1.3	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	

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Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	
1,3,5-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	87.4		ug/L	ND	109	50-140			
Surrogate: Dibromofluoromethane	86.2		ug/L	ND	108	50-140			
Surrogate: Toluene-d8	78.6		ug/L	ND	98.3	50-140			

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.81		mg/L	ND	98.1	78-112			
General Inorganics									
Cyanide, free	24.2	2	ug/L	ND	80.5	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	2050	25	ug/L	ND	103	68-117			
F2 PHCs (C10-C16)	2020	100	ug/L	ND	112	60-140			
F3 PHCs (C16-C34)	4070	100	ug/L	ND	109	60-140			
F4 PHCs (C34-C50)	2300	100	ug/L	ND	92.9	60-140			
Metals									
Mercury	3.21	0.1	ug/L	ND	107	78-137			
Antimony	47.7		ug/L	ND	96.1	80-120			
Arsenic	50.6		ug/L	ND	104	80-120			
Barium	47.0		ug/L	ND	94.0	80-120			
Beryllium	45.1		ug/L	0.02	90.2	80-120			
Boron	44		ug/L	3	80.5	80-120			
Cadmium	51.4		ug/L	0.18	102	80-120			
Chromium (VI)	212	10	ug/L	ND	106	70-130			
Chromium	45.9		ug/L	0.8	90.1	80-120			
Cobalt	44.6		ug/L	0.001	89.3	80-120			
Copper	46.4		ug/L	0.05	92.7	80-120			
Lead	45.8		ug/L	ND	91.6	80-120			
Molybdenum	43.2		ug/L	ND	87.0	80-120			
Nickel	45.6		ug/L	ND	91.2	80-120			
Selenium	63.6		ug/L	0.09	127	80-120			QM-07
Silver	45.6		ug/L	ND	91.3	80-120			
Sodium	923		ug/L	23	90.0	80-120			
Thallium	47.3		ug/L	ND	94.9	80-120			
Uranium	46.2		ug/L	ND	92.5	80-120			
Vanadium	46.9		ug/L	0.21	93.4	80-120			
Zinc	60		ug/L	0.2	120	80-120			
Semi-Volatiles									
Acenaphthene	5.40	0.05	ug/L	ND	108	50-140			
Acenaphthylene	5.07	0.05	ug/L	ND	101	50-140			
Anthracene	4.89	0.01	ug/L	ND	97.8	50-140			
Benzo [a] anthracene	4.94	0.01	ug/L	ND	98.8	50-140			
Benzo [a] pyrene	4.88	0.01	ug/L	ND	97.6	50-140			
Benzo [b] fluoranthene	4.70	0.05	ug/L	ND	94.0	50-140			
Benzo [g,h,i] perylene	3.95	0.05	ug/L	ND	79.0	50-140			
Benzo [k] fluoranthene	4.47	0.05	ug/L	ND	89.4	50-140			
Biphenyl	6.74	0.05	ug/L	ND	135	50-140			
Chrysene	5.15	0.05	ug/L	ND	103	50-140			
Dibenzo [a,h] anthracene	2.91	0.05	ug/L	ND	58.3	50-140			
Fluoranthene	4.87	0.01	ug/L	ND	97.4	50-140			
Fluorene	4.87	0.05	ug/L	ND	97.4	50-140			
Indeno [1,2,3-cd] pyrene	3.29	0.05	ug/L	ND	65.8	50-140			
1-Methylnaphthalene	4.13	0.05	ug/L	ND	82.6	50-140			
2-Methylnaphthalene	4.38	0.05	ug/L	ND	87.7	50-140			
Naphthalene	4.72	0.05	ug/L	ND	94.4	50-140			

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Phenanthrene	5.11	0.05	ug/L	ND	102	50-140			
Pyrene	4.97	0.01	ug/L	ND	99.5	50-140			
Surrogate: 2-Fluorobiphenyl	25.8		ug/L		129	50-140			
Volatiles									
Acetone	57.2	5.0	ug/L	ND	57.2	50-140			
Benzene	42.8	0.5	ug/L	ND	107	50-140			
Bromodichloromethane	47.3	0.5	ug/L	ND	118	50-140			
Bromoform	31.0	0.5	ug/L	ND	77.5	50-140			
Bromomethane	35.1	0.5	ug/L	ND	87.8	50-140			
Carbon Tetrachloride	42.4	0.2	ug/L	ND	106	50-140			
Chlorobenzene	40.6	0.5	ug/L	ND	102	50-140			
Chloroethane	29.5	1.0	ug/L	ND	73.7	50-140			
Chloroform	43.9	0.5	ug/L	ND	110	50-140			
Chloromethane	28.7	3.0	ug/L	ND	71.7	50-140			
Dibromochloromethane	48.2	0.5	ug/L	ND	121	50-140			
Dichlorodifluoromethane	26.9	1.0	ug/L	ND	67.2	50-140			
1,2-Dibromoethane	38.0	0.2	ug/L	ND	95.0	50-140			
1,2-Dichlorobenzene	40.6	0.5	ug/L	ND	101	50-140			
1,3-Dichlorobenzene	38.9	0.5	ug/L	ND	97.2	50-140			
1,4-Dichlorobenzene	37.6	0.5	ug/L	ND	94.0	50-140			
1,1-Dichloroethane	45.8	0.5	ug/L	ND	115	50-140			
1,2-Dichloroethane	38.6	0.5	ug/L	ND	96.5	50-140			
1,1-Dichloroethylene	26.5	0.5	ug/L	ND	66.2	50-140			
cis-1,2-Dichloroethylene	46.8	0.5	ug/L	ND	117	50-140			
trans-1,2-Dichloroethylene	46.9	0.5	ug/L	ND	117	50-140			
1,2-Dichloropropane	36.8	0.5	ug/L	ND	92.1	50-140			
cis-1,3-Dichloropropylene	44.4	0.5	ug/L	ND	111	50-140			
trans-1,3-Dichloropropylene	44.1	0.5	ug/L	ND	110	50-140			
Ethylbenzene	38.7	0.5	ug/L	ND	96.8	50-140			
Hexane	32.4	1.0	ug/L	ND	81.0	50-140			
Methyl Ethyl Ketone (2-Butanone)	48.1	5.0	ug/L	ND	48.1	50-140			
Methyl Butyl Ketone (2-Hexanone)	57.6	10.0	ug/L	ND	57.6	50-140			
Methyl Isobutyl Ketone	91.4	5.0	ug/L	ND	91.4	50-140			
Methyl tert-butyl ether	77.8	2.0	ug/L	ND	77.8	50-140			
Methylene Chloride	45.8	5.0	ug/L	ND	115	50-140			
Styrene	37.5	0.5	ug/L	ND	93.6	50-140			
1,1,1,2-Tetrachloroethane	46.6	0.5	ug/L	ND	117	50-140			
1,1,2,2-Tetrachloroethane	52.5	0.5	ug/L	ND	131	50-140			
Tetrachloroethylene	38.8	0.5	ug/L	ND	97.0	50-140			
Toluene	37.4	0.5	ug/L	ND	93.4	50-140			
1,2,4-Trichlorobenzene	42.2	0.5	ug/L	ND	106	50-140			
1,1,1-Trichloroethane	51.0	0.5	ug/L	ND	127	50-140			
1,1,2-Trichloroethane	40.1	0.5	ug/L	ND	100	50-140			
Trichloroethylene	42.2	0.5	ug/L	ND	105	50-140			
Trichlorofluoromethane	29.6	1.0	ug/L	ND	73.9	50-140			
1,3,5-Trimethylbenzene	39.7	0.5	ug/L	ND	99.2	50-140			
Vinyl chloride	41.1	0.5	ug/L	ND	103	50-140			
m,p-Xylenes	75.5	0.5	ug/L	ND	94.4	50-140			
o-Xylene	32.8	0.5	ug/L	ND	82.0	50-140			

Certificate of Analysis

Report Date: 09-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 31-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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



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Chain of Custody
(Lab Use Only)
Nº 96653

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Client Name: <i>Stantec</i>	Project Reference: <i>122510670. 215</i>	TAT: <input checked="" type="checkbox"/> Regular 13 Day
Contact Name: <i>Jill Petrus - Dechman</i>	Quote #: <i>SOA # 0190... City of Ottawa</i>	12 Day 11 Day
Address: <i>1331 Clyde Ave</i>	PO #	Date Required: _____
Telephone: <i>613-722-4420</i>	Email Address: <i>jill.petrus-dechman@stantec</i>	

Criteria: O. Reg. 153/04 Table 1 | O. Reg. 153/11 (Current) Table 1 | 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)

Paracel Order Number: <i>1331219</i>				Required Analyses															
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs FI-F4+BTEX	VOCs	PAHs	Metals by ICP/MS	Hg	CrVI	B (HWS)							
				Date	Time														
1																			
<i>MW13-11 BA1507</i>	<i>GW</i>		<i>10</i>	<i>July 31</i>	<i>10:00</i>	X	X	X	X	X	X								
<i>MW13-14 BA1508</i>	<i>GW</i>		<i>10</i>	<i>July 31</i>	<i>10:45</i>	X	X	X	X	X	X								
<i>MW13-140 BA1509</i>	<i>GW</i>		<i>10</i>	<i>2013</i>	<i>11:00</i>	X	X	X	X	X	X								
<i>Trip Blank BA1510</i>							X												
5																			
6																			
7																			
8																			
9																			
10																			

Comments: ** Received extra VOC vial for Trip Blank. See SSDF. - mjc*
Extra gen., chlorine, cn bottle for each sample.

Relinquished By (Print & Sign): <i>A. Waldick / [Signature]</i>	Received by Driver/Depot: <i>[Signature]</i>	Received at Lab: <i>SUNEPORN</i>	Verified By: <i>mjc</i>
Date/Time: <i>31/07/13 3:21 PM</i>	Temperature: _____ °C	Date/Time: <i>JUL 31, 2013 04:20</i>	Date/Time: <i>July 31 / 13 / 6:34</i>
Date/Time: <i>2013/07/31</i>	Temperature: _____ °C	Temperature: <i>14.8 °C</i>	pH Verified LB: <i>mjc</i>

Sample Submission Deficiency Form

Client:	Stantec.		Date:	July 31/13
Contact:	Jill Peters - Dechman / Allisen Waldick		COC #	96653
Project:	122510670.215 (City of Ottawa)	REGULATED:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	CSR:
Issue:	<input type="checkbox"/> COC <input checked="" type="checkbox"/> SAMPLE <input type="checkbox"/> OTHER	REG:	153, Table 1	MJC

Client Sample ID	Problem	Resolution	Initial
Trip Blank	- received VOC vial for Trip Blank not listed on COC	- add Trip Blank for VOC analysis to WO per Allisen	MJC
extra bottles for samples MW13-11, MW13-14, MW13-140	- received extra Cr, gen chem, chlorine bottles for all samples	- analyze for chlorine , total Cr MOE general inorganics package per Allisen.	MJC

Client Notified by Telephone (Date/Time): July 31/13, Aug 2/13, Aug 6/13, Aug 7/13

Comments: _____

Client must initial samples, sign and return form to lab prior to any work commencing on samples listed on this form.

Client Authorization Signature: _____ DATE: _____

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.205/ Boteler
Custody: 10423

Report Date: 14-Aug-2013
Order Date: 26-Jul-2013

Order #: 1331026

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

Paracel ID	Client ID
1331026-01	Comp 1
1331026-02	Comp 2

Approved By:



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

Certificate of Analysis

Report Date: 14-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 26-Jul-2013

Client PO: 45064625

Project Description: 122510670.205/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Atlantic RBCA Tier 2 Petroleum Hydrocarbons	Subcontract	31-Jul-13	31-Jul-13
pH	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	29-Jul-13	30-Jul-13

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Certificate of Analysis

Report Date: 14-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 26-Jul-2013

Client PO: 45064625

Project Description: 122510670.205/ Boteler

Client ID:	Comp 1	Comp 2	-	-
Sample Date:	26-Jul-13	26-Jul-13	-	-
Sample ID:	1331026-01	1331026-02	-	-
MDL/Units	Soil	Soil	-	-

General Inorganics

pH	0.05 pH Units	-	7.83	-	-
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Subcontract

Benzene	0.005 ug/g	0.008 [1]	-	-	-
Toluene	0.05 ug/g	<0.05 [1]	-	-	-
Ethylbenzene	0.01 ug/g	0.03 [1]	-	-	-
Xylenes, total	0.05 ug/g	0.1 [1]	-	-	-
C6-C8 Aliphatics	2.0 ug/g	<2.0 [1]	-	-	-
C8-C10 Aliphatics	2.0 ug/g	<2.0 [1]	-	-	-
C10-C12 Aliphatics	5.0 ug/g	10.0 [1]	-	-	-
C12-C16 Aliphatics	5.0 ug/g	160 [1]	-	-	-
C16-C21 Aliphatics	5.0 ug/g	260 [1]	-	-	-
C21-C34 Aliphatics	5.0 ug/g	60.0 [1]	-	-	-
C8-C10 Aromatics	0.1 ug/g	0.3 [1]	-	-	-
C10-C12 Aromatics	5.0 ug/g	<5.0 [1]	-	-	-
C12-C16 Aromatics	5.0 ug/g	61.0 [1]	-	-	-
C16-C21 Aromatics	5.0 ug/g	170 [1]	-	-	-
C21-C34 Aromatics	5.0 ug/g	210 [1]	-	-	-
TPH	14.0 ug/g	840 [1] [2]	-	-	-

Certificate of Analysis

Report Date: 14-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 26-Jul-2013

Client PO: 45064625

Project Description: 122510670.205/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.87	0.05	pH Units	7.88			0.1	10	

Certificate of Analysis

Report Date: 14-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 26-Jul-2013

Client PO: 45064625

Project Description: 122510670.205/ Boteler

Qualifier Notes:

Sample Qualifiers :

- 1 : Subcontracted analysis.
- 2 : Resemblance: Weathered Fuel Oil and Lube Oil Fraction with possible PAHs detected.

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.

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.220/ Boteler
Custody:

Report Date: 11-Aug-2013
Order Date: 25-Jul-2013

Order #: 1330318

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

Parcel ID	Client ID
1330318-01	MW13-12 SS5
1330318-04	MW13-14 SS3
1330318-07	MW13-120 SS5
1330318-08	MW13-13 SS5
1330318-11	BH13-9 SS5
1330318-13	BH13-8

Approved By:



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

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	31-Jul-13	1-Aug-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	29-Jul-13	30-Jul-13
Conductivity	MOE E3138 - probe @25 °C, water ext	30-Jul-13	30-Jul-13
Mercury	EPA 7471A - CVAA, digestion	30-Jul-13	30-Jul-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	31-Jul-13	31-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	30-Jul-13	31-Jul-13
PCBs, total	SW846 8082A - GC-ECD	29-Jul-13	30-Jul-13
pH	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	29-Jul-13	30-Jul-13
PHC F1	CWS Tier 1 - P&T GC-FID	29-Jul-13	31-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	30-Jul-13	31-Jul-13
SAR	Calculation	1-Aug-13	2-Aug-13
Solids, %	Gravimetric, calculation	29-Jul-13	29-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	29-Jul-13	31-Jul-13

Certificate of Analysis

Report Date: 11-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	MW13-12 SS5	MW13-14 SS3	MW13-120 SS5	MW13-13 SS5
	Sample Date:	25-Jul-13	25-Jul-13	25-Jul-13	25-Jul-13
	Sample ID:	1330318-01	1330318-04	1330318-07	1330318-08
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	89.3	81.8	92.2	83.7
----------	--------------	------	------	------	------

General Inorganics

SAR	0.01 N/A	2.68	3.32	2.26	1.72
Conductivity	5 uS/cm	360	351	440	311
pH	0.05 pH Units	7.92	-	7.92	-

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.1	<1.0	1.2	<1.0
Barium	1.0 ug/g dry	84.6	47.4	74.2	115
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	3.0	2.0	2.8	2.6
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	14.2	11.0	17.4	16.8
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	4.7	4.0	4.7	5.4
Copper	1.0 ug/g dry	10.5	8.7	10.5	10.9
Lead	1.0 ug/g dry	14.4	3.4	14.4	4.0
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	1.5	<1.0
Nickel	1.0 ug/g dry	7.9	6.4	8.0	9.3
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	21.0	20.5	20.7	27.4
Zinc	1.0 ug/g dry	25.1	16.4	22.8	23.0

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

Report Date: 11-Aug-2013

Order Date: 25-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	MW13-12 SS5	MW13-14 SS3	MW13-120 SS5	MW13-13 SS5
	Sample Date:	25-Jul-13	25-Jul-13	25-Jul-13	25-Jul-13
	Sample ID:	1330318-01	1330318-04	1330318-07	1330318-08
	MDL/Units	Soil	Soil	Soil	Soil
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloromethane	0.20 ug/g dry	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	<2.00	<2.00
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	MW13-12 SS5	MW13-14 SS3	MW13-120 SS5	MW13-13 SS5
	Sample Date:	25-Jul-13	25-Jul-13	25-Jul-13	25-Jul-13
	Sample ID:	1330318-01	1330318-04	1330318-07	1330318-08
	MDL/Units	Soil	Soil	Soil	Soil
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	100%	99.5%	99.8%	100%
Dibromofluoromethane	Surrogate	102%	105%	103%	99.5%
Toluene-d8	Surrogate	106%	98.5%	103%	96.5%

Hydrocarbons

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

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	0.08	<0.02	0.13	<0.02
Anthracene	0.02 ug/g dry	0.11	<0.02	0.17	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.16	<0.02	0.29	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.14	<0.02	0.23	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.11	<0.02	0.27	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.06	<0.02	0.11	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.05	<0.02	0.10	<0.02
Biphenyl	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	0.15	<0.02	0.28	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	0.03	<0.02
Fluoranthene	0.02 ug/g dry	0.34	<0.02	0.60	<0.02
Fluorene	0.02 ug/g dry	0.03	<0.02	0.06	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.05	<0.02	0.10	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	0.02	<0.01

Certificate of Analysis

Report Date: 11-Aug-2013

Order Date: 25-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	MW13-12 SS5	MW13-14 SS3	MW13-120 SS5	MW13-13 SS5
	Sample Date:	25-Jul-13	25-Jul-13	25-Jul-13	25-Jul-13
	Sample ID:	1330318-01	1330318-04	1330318-07	1330318-08
	MDL/Units	Soil	Soil	Soil	Soil
Phenanthrene	0.02 ug/g dry	0.26	<0.02	0.47	<0.02
Pyrene	0.02 ug/g dry	0.28	<0.02	0.45	<0.02
2-Fluorobiphenyl	Surrogate	119%	62.4%	51.8%	82.9%
Terphenyl-d14	Surrogate	63.5%	52.1%	50.8%	55.5%

PCBs

PCBs, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Decachlorobiphenyl	Surrogate	95.9%	80.6%	74.5%	-

Certificate of Analysis

Report Date: 11-Aug-2013

Order Date: 25-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Client ID:	BH13-9 SS5	BH13-8	-	-
Sample Date:	25-Jul-13	25-Jul-13	-	-
Sample ID:	1330318-11	1330318-13	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	89.2	82.7	-	-
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General Inorganics

SAR	0.01 N/A	35.6	12.2	-	-
Conductivity	5 uS/cm	5250	4790	-	-

Metals

Antimony	1.0 ug/g dry	<1.0	1.2	-	-
Arsenic	1.0 ug/g dry	2.4	5.1	-	-
Barium	1.0 ug/g dry	136	180	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	5.6	7.8	-	-
Boron, available	0.5 ug/g dry	1.1	1.0	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	20.7	17.1	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	-
Cobalt	1.0 ug/g dry	6.2	5.6	-	-
Copper	1.0 ug/g dry	11.1	68.6	-	-
Lead	1.0 ug/g dry	8.0	464	-	-
Mercury	0.1 ug/g dry	<0.1	0.7	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	12.5	10.9	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	<0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	43.3	23.2	-	-
Zinc	1.0 ug/g dry	47.3	113	-	-

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Report Date: 11-Aug-2013

Order Date: 25-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	MDL/Units	Client ID:	BH13-9 SS5	BH13-8		
		Sample Date:	25-Jul-13	25-Jul-13		
		Sample ID:	1330318-11	1330318-13		
			Soil	Soil		
Chlorobenzene	0.05 ug/g dry		<0.05	<0.05	-	-
Chloroethane	0.05 ug/g dry		<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry		<0.05	<0.05	-	-
Chloromethane	0.20 ug/g dry		<0.20	<0.20	-	-
Dibromochloromethane	0.05 ug/g dry		<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry		<0.05	<0.05	-	-
1,2-Dibromoethane	0.05 ug/g dry		<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry		<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry		<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry		<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry		<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry		<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry		<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry		<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry		<0.05	<0.05	-	-
1,2-Dichloroethylene, total	0.05 ug/g dry		<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry		<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry		<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry		<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry		<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry		<0.05	<0.05	-	-
Hexane	0.05 ug/g dry		<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry		<0.50	<0.50	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry		<2.00	<2.00	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry		<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry		<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry		<0.05	<0.05	-	-
Styrene	0.05 ug/g dry		<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry		<0.05	<0.05	-	-
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry		<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry		<0.05	<0.05	-	-
Toluene	0.05 ug/g dry		<0.05	<0.05	-	-
1,2,4-Trichlorobenzene	0.05 ug/g dry		<0.05	<0.05	-	-

Certificate of Analysis

Report Date: 11-Aug-2013

Order Date: 25-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID: Sample Date: Sample ID: MDL/Units	BH13-9 SS5 25-Jul-13 1330318-11 Soil	BH13-8 25-Jul-13 1330318-13 Soil	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,3,5-Trimethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	99.0%	99.4%	-	-
Dibromofluoromethane	Surrogate	105%	105%	-	-
Toluene-d8	Surrogate	108%	100%	-	-

Hydrocarbons

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

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	0.09	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	0.27	-	-
Anthracene	0.02 ug/g dry	<0.02	0.47	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	0.76	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	0.82	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	0.93	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	0.41	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	0.33	-	-
Biphenyl	0.02 ug/g dry	<0.02	<0.02	-	-
Chrysene	0.02 ug/g dry	<0.02	0.87	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	0.11	-	-
Fluoranthene	0.02 ug/g dry	<0.02	1.71	-	-
Fluorene	0.02 ug/g dry	<0.02	0.18	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	0.37	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	0.04	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	0.04	-	-

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Certificate of Analysis

Report Date: 11-Aug-2013

Order Date: 25-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.220/ Boteler

	Client ID:	BH13-9 SS5	BH13-8	-	-
	Sample Date:	25-Jul-13	25-Jul-13	-	-
	Sample ID:	1330318-11	1330318-13	-	-
	MDL/Units	Soil	Soil	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	0.08	-	-
Naphthalene	0.01 ug/g dry	<0.01	0.09	-	-
Phenanthrene	0.02 ug/g dry	<0.02	1.45	-	-
Pyrene	0.02 ug/g dry	<0.02	1.35	-	-
2-Fluorobiphenyl	Surrogate	55.4%	90.5%	-	-
Terphenyl-d14	Surrogate	57.0%	57.8%	-	-
PCBs					
PCBs, total	0.05 ug/g dry	<0.05	<0.05	-	-
Decachlorobiphenyl	Surrogate	92.9%	85.0%	-	-

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
PCBs									
PCBs, total	ND	0.05	ug/g						
Surrogate: Decachlorobiphenyl	0.0564		ug/g		56.4	60-140			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.709		ug/g		53.2	50-140			
Surrogate: Terphenyl-d14	0.874		ug/g		65.5	50-140			

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

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						
Chloroethane	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Chloromethane	ND	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	3.26		ug/g		102	50-140			
Surrogate: Dibromofluoromethane	1.84		ug/g		57.4	50-140			
Surrogate: Toluene-d8	3.08		ug/g		96.2	50-140			

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	352	5	uS/cm	360			2.1	6.2	
pH	7.87	0.05	pH Units	7.88			0.1	10	
Hydrocarbons									
F1 PHCs (C6-C10)	16	7	ug/g dry	14			14.2	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	ND	1.0	ug/g dry	1.06			0.0	30	
Barium	64.9	1.0	ug/g dry	84.6			26.4	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	2.62	1.0	ug/g dry	3.01			13.8	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.0	1.0	ug/g dry	14.2			8.7	30	
Cobalt	4.26	1.0	ug/g dry	4.65			8.7	30	
Copper	10.0	1.0	ug/g dry	10.5			4.7	30	
Lead	18.4	1.0	ug/g dry	14.4			24.8	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	7.63	1.0	ug/g dry	7.93			3.8	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	1.30	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	19.3	1.0	ug/g dry	21.0			8.5	30	
Zinc	26.6	1.0	ug/g dry	25.1			6.1	30	
PCBs									
PCBs, total	ND	0.05	ug/g dry	ND				40	
Surrogate: Decachlorobiphenyl	0.0878		ug/g dry	ND	78.4	60-140			
Physical Characteristics									
% Solids	85.0	0.1	% by Wt.	85.4			0.4	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	0.060	0.02	ug/g dry	0.078			25.4	40	
Anthracene	0.073	0.02	ug/g dry	0.114			44.4	40	
Benzo [a] anthracene	0.116	0.02	ug/g dry	0.160			32.2	40	
Benzo [a] pyrene	0.101	0.02	ug/g dry	0.140			32.3	40	
Benzo [b] fluoranthene	0.094	0.02	ug/g dry	0.113			19.0	40	
Benzo [g,h,i] perylene	0.051	0.02	ug/g dry	0.056			8.6	40	
Benzo [k] fluoranthene	0.039	0.02	ug/g dry	0.046			16.1	40	
Biphenyl	ND	0.02	ug/g dry	ND				40	
Chrysene	0.110	0.02	ug/g dry	0.146			27.7	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	0.233	0.02	ug/g dry	0.340			37.3	40	
Fluorene	ND	0.02	ug/g dry	0.032			0.0	40	
Indeno [1,2,3-cd] pyrene	0.047	0.02	ug/g dry	0.054			15.3	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND			0.0	40	
Phenanthrene	0.149	0.02	ug/g dry	0.264			55.8	40	QR-01

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Pyrene	0.194	0.02	ug/g dry	0.280			36.3	40	
Surrogate: 2-Fluorobiphenyl	0.822		ug/g dry	ND	55.0	50-140			
Surrogate: Terphenyl-d14	0.900		ug/g dry	ND	60.3	50-140			
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	
Chloroethane	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Chloromethane	ND	0.20	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	0.554	0.05	ug/g dry	0.698			23.1	50	
Hexane	ND	0.05	ug/g dry	ND			0.0	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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	
1,1,1,2,2-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			0.0	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	0.385	0.05	ug/g dry	0.406			5.2	50	
Vinyl chloride	ND	0.02	ug/g dry	ND			0.0	50	
m,p-Xylenes	0.595	0.05	ug/g dry	0.761			24.4	50	
o-Xylene	ND	0.05	ug/g dry	ND			0.0	50	
Surrogate: 4-Bromofluorobenzene	2.37		ug/g dry	ND	106	50-140			
Surrogate: Dibromofluoromethane	1.73		ug/g dry	ND	77.2	50-140			
Surrogate: Toluene-d8	1.82		ug/g dry	ND	81.3	50-140			

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	199	7	ug/g	ND	99.7	80-120			
F2 PHCs (C10-C16)	76	4	ug/g	ND	75.1	60-140			
F3 PHCs (C16-C34)	201	8	ug/g	ND	96.4	60-140			
F4 PHCs (C34-C50)	129	6	ug/g	ND	92.7	60-140			
Metals									
Antimony	229		ug/L	ND	91.5	70-130			
Arsenic	238		ug/L	ND	95.1	70-130			
Barium	238		ug/L	ND	95.4	70-130			
Beryllium	224		ug/L	ND	89.4	70-130			
Boron, available	4.46	0.5	ug/g	ND	89.2	70-122			
Boron	235		ug/L	ND	94.0	70-130			
Cadmium	223		ug/L	ND	89.3	70-130			
Chromium (VI)	4.8	0.2	ug/g	ND	86.0	70-130			
Chromium	229		ug/L	ND	91.6	70-130			
Cobalt	228		ug/L	ND	91.4	70-130			
Copper	234		ug/L	ND	93.6	70-130			
Lead	219		ug/L	ND	87.8	70-130			
Mercury	1.70	0.1	ug/g	ND	113	72-128			
Molybdenum	236		ug/L	ND	94.4	70-130			
Nickel	232		ug/L	ND	92.6	70-130			
Selenium	228		ug/L	ND	91.0	70-130			
Silver	207		ug/L	ND	82.8	70-130			
Thallium	246		ug/L	ND	98.3	70-130			
Uranium	235		ug/L	ND	93.8	70-130			
Vanadium	235		ug/L	ND	93.8	70-130			
Zinc	222		ug/L	ND	88.6	70-130			
PCBs									
PCBs, total	0.525	0.05	ug/g	ND	117	60-140			
Surrogate: Decachlorobiphenyl	0.0709		ug/g		63.3	60-140			
Semi-Volatiles									
Acenaphthene	0.208	0.02	ug/g	ND	111	50-140			
Acenaphthylene	0.239	0.02	ug/g	0.078	86.3	50-140			
Anthracene	0.281	0.02	ug/g	0.114	89.3	50-140			
Benzo [a] anthracene	0.320	0.02	ug/g	0.160	85.7	50-140			
Benzo [a] pyrene	0.300	0.02	ug/g	0.140	85.7	50-140			
Benzo [b] fluoranthene	0.272	0.02	ug/g	0.113	85.0	50-140			
Benzo [g,h,i] perylene	0.198	0.02	ug/g	0.056	76.1	50-140			
Benzo [k] fluoranthene	0.225	0.02	ug/g	0.046	95.9	50-140			
Biphenyl	0.299	0.02	ug/g	ND	160	50-140			QM-06
Chrysene	0.328	0.02	ug/g	0.146	97.7	50-140			
Dibenzo [a,h] anthracene	0.181	0.02	ug/g	ND	96.8	50-140			
Fluoranthene	0.413	0.02	ug/g	0.340	38.9	50-140			QM-06
Fluorene	0.258	0.02	ug/g	0.032	121	50-140			
Indeno [1,2,3-cd] pyrene	0.223	0.02	ug/g	0.054	90.2	50-140			
1-Methylnaphthalene	0.129	0.02	ug/g	ND	69.2	50-140			
2-Methylnaphthalene	0.139	0.02	ug/g	ND	74.2	50-140			
Naphthalene	0.149	0.01	ug/g	ND	80.0	50-140			
Phenanthrene	0.353	0.02	ug/g	0.264	48.0	50-140			QM-06

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Pyrene	0.380	0.02	ug/g	0.280	53.2	50-140			
Volatiles									
Acetone	7.93	0.50	ug/g	ND	79.3	50-140			
Benzene	4.15	0.02	ug/g	ND	104	60-130			
Bromodichloromethane	3.43	0.05	ug/g	ND	85.6	60-130			
Bromoform	2.48	0.05	ug/g	ND	62.0	60-130			
Bromomethane	4.43	0.05	ug/g	ND	111	50-140			
Carbon Tetrachloride	3.10	0.05	ug/g	ND	77.4	60-130			
Chlorobenzene	4.18	0.05	ug/g	ND	105	60-130			
Chloroethane	3.49	0.05	ug/g	ND	87.3	50-140			
Chloroform	4.10	0.05	ug/g	ND	103	60-130			
Chloromethane	2.96	0.20	ug/g	ND	74.0	50-140			
Dibromochloromethane	3.19	0.05	ug/g	ND	79.8	60-130			
Dichlorodifluoromethane	4.37	0.05	ug/g	ND	109	50-140			
1,2-Dibromoethane	3.92	0.05	ug/g	ND	98.1	60-130			
1,2-Dichlorobenzene	3.72	0.05	ug/g	ND	93.1	60-130			
1,3-Dichlorobenzene	3.85	0.05	ug/g	ND	96.4	60-130			
1,4-Dichlorobenzene	3.33	0.05	ug/g	ND	83.3	60-130			
1,1-Dichloroethane	2.98	0.05	ug/g	ND	74.4	60-130			
1,2-Dichloroethane	4.21	0.05	ug/g	ND	105	60-130			
1,1-Dichloroethylene	3.16	0.05	ug/g	ND	78.9	60-130			
cis-1,2-Dichloroethylene	4.63	0.05	ug/g	ND	116	60-130			
trans-1,2-Dichloroethylene	3.22	0.05	ug/g	ND	80.6	60-130			
1,2-Dichloropropane	3.63	0.05	ug/g	ND	90.7	60-130			
cis-1,3-Dichloropropylene	2.97	0.05	ug/g	ND	74.3	60-130			
trans-1,3-Dichloropropylene	2.45	0.05	ug/g	ND	61.4	60-130			
Ethylbenzene	4.30	0.05	ug/g	ND	107	60-130			
Hexane	5.02	0.05	ug/g	ND	126	60-130			
Methyl Ethyl Ketone (2-Butanone)	7.28	0.50	ug/g	ND	72.8	50-140			
Methyl Butyl Ketone (2-Hexanone)	5.58	2.00	ug/g	ND	55.8	50-140			
Methyl Isobutyl Ketone	8.61	0.50	ug/g	ND	86.1	50-140			
Methyl tert-butyl ether	7.04	0.05	ug/g	ND	70.4	50-140			
Methylene Chloride	3.84	0.05	ug/g	ND	96.0	60-130			
Styrene	4.19	0.05	ug/g	ND	105	60-130			
1,1,1,2-Tetrachloroethane	3.29	0.05	ug/g	ND	82.3	60-130			
1,1,2,2-Tetrachloroethane	3.83	0.05	ug/g	ND	95.7	60-130			
Tetrachloroethylene	4.09	0.05	ug/g	ND	102	60-130			
Toluene	4.44	0.05	ug/g	ND	111	60-130			
1,2,4-Trichlorobenzene	3.44	0.05	ug/g	ND	85.9	60-130			
1,1,1-Trichloroethane	3.10	0.05	ug/g	ND	77.6	60-130			
1,1,2-Trichloroethane	3.63	0.05	ug/g	ND	90.9	60-130			
Trichloroethylene	3.55	0.05	ug/g	ND	88.8	60-130			
Trichlorofluoromethane	2.76	0.05	ug/g	ND	69.0	50-140			
1,3,5-Trimethylbenzene	4.11	0.05	ug/g	ND	103	60-130			
Vinyl chloride	2.86	0.02	ug/g	ND	71.5	50-140			
m,p-Xylenes	7.78	0.05	ug/g	ND	97.3	60-130			
o-Xylene	4.19	0.05	ug/g	ND	105	60-130			

Certificate of Analysis

Report Date: 11-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.220/ Boteler

Qualifier Notes:

QC Qualifiers :

QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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



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Chain of Custody
(Lab Use Only)

Page 1 of 2

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Client Name: Stantec Consulting Ltd.	Project Reference: 122510670.220	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: Jill Peters-Dechman	Quote # City Of Ottawa SOA 19609-91843-S01	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: 1331 Clyde Avenue Suite 400 Ottawa, ON K2C3G4	PO #	Date Required: _____
Telephone: 613-722-4420	Email Address: jill.peters-dechman@stantec.com	

Criteria O. Reg. 153 (As Amended) Table 1 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)

Parcel Order Number: 1330318		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PCBs	FOC	EC/SAR	pH				
Sample ID/Location Name	Date				Time																
1	MW 13-12 S55	BA14le0		3	↑	AM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2x250ml +1vial
2	MW 13-12	BA14le0		1	↑	AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	↓
3	MW 13-12 S51	BA14le1		1	July	AM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2x250ml +1vial
4	MW 13-14 S53	BA14le2		3	July	PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	120ml
5	MW 13-14 S51	BA14le3		1	25/08	PM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	250ml
6	MW 13-14	BA14le4		1	↓	PM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2x250ml +1vial
7	MW 13-120 S55	BA14le5		3	↓	AM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	↓
8	MW 13-13 S55	BA14le6		3	↓	PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	120ml
9	MW 13-13	BA14le7		1	↓	PM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10		BA14le8			↓		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments: _____ Method of Delivery: Walk-in

Relinquished By (Sign): <i>A. Waldick</i>	Received by Driver/Depot:	Received at Lab: <i>MJC</i>	Verified By: <i>MJC</i>
Relinquished By (Print): A. Waldick	Date/Time: _____	Date/Time: July 25/13 6:28	Date/Time: July 26/13 3:08
Date/Time: 2013/07/25	Temperature: _____ °C	Temperature: 6.9 °C	pH Verified [] By: N/A



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Chain of Custody
(Lab Use Only)

Page 2 of 2

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Client Name: Stantec Consulting Ltd.	Project Reference: 122510670.220	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: Jill Peters-Dechman	Quote # City Of Ottawa SOA 19609-91843-S01	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: 1331 Clyde Avenue Suite 400 Ottawa, ON K2C3G4	PO #	Date Required: _____
Telephone: 613-722-4420	Email Address: jill.peters-dechman@stantec.com	

Criteria: O. Reg. 153 (As Amended) Table 1 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)

Paracel Order Number: 1330318				Required Analyses																
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP				PCBs	FOC	EC/SAR	pH				
				Date	Time				Hg	Cd	Cu	Pb								
1. BH 13-9 SS3 BA1468	S		1		Pm															130ml
2. BH 13-9 SS5 BA1469	S		3		Pm															250ml
3. BH 13-9 BA1470	S		3	July	Pm															130ml
4. BH 13-8 BA1471	S		3	25/08	Pm															250ml
5.	S																			
6.	S																			
7.	S																			
8.	S																			
9.	S																			
10.	S																			

Comments: BH 13-8 (120ml) use for FOC. If not enough soil, pls contact. low recovery. pls contact if 1x 250ml is not enough for all analyses. Walk-in

Relinquished By (Sign): <i>A. Waldick</i>	Received by Driver/Depot:	Received at Lab: <i>MC</i>	Verified By: <i>MC</i>
Relinquished By (Print): A. Waldick	Date/Time: _____	Date/Time: July 25/13 6:28	Date/Time: July 26/13 3:28
Date/Time: 2013/07/25	Temperature: _____ °C	Temperature: 6.9 °C	pH Verified [] By: NA

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.215/ Boteler
Custody: 10422

Report Date: 1-Aug-2013
Order Date: 25-Jul-2013

Order #: 1330261

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

Paracel ID	Client ID
1330261-01	TP190-3
1330261-02	TP200-3

Approved By:



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

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	29-Jul-13	30-Jul-13
Chromium, hexavalent	MOE E3056 - Extraction, colourimetric	29-Jul-13	30-Jul-13
Mercury	EPA 7471A - CVAA, digestion	29-Jul-13	30-Jul-13
MOE Metals by ICP-OES, soil Reg 153	based on MOE E3470, ICP-OES	31-Jul-13	31-Jul-13
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	30-Jul-13	1-Aug-13
PHC F1	CWS Tier 1 - P&T GC-FID	29-Jul-13	31-Jul-13
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	30-Jul-13	31-Jul-13
Solids, %	Gravimetric, calculation	29-Jul-13	29-Jul-13
VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	29-Jul-13	31-Jul-13

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Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 01-Aug-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Client ID:	TP190-3	TP200-3	-	-
Sample Date:	25-Jul-13	25-Jul-13	-	-
Sample ID:	1330261-01	1330261-02	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	86.7	87.2	-	-
----------	--------------	------	------	---	---

Metals

Antimony	1.0 ug/g dry	1.6	<1.0	-	-
Arsenic	1.0 ug/g dry	<1.0	3.0	-	-
Barium	1.0 ug/g dry	69.9	152	-	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	-	-
Boron	1.0 ug/g dry	2.2	5.3	-	-
Boron, available	0.5 ug/g dry	<0.5	<0.5	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	1.0 ug/g dry	15.2	18.6	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	-
Cobalt	1.0 ug/g dry	4.5	6.1	-	-
Copper	1.0 ug/g dry	10.9	19.1	-	-
Lead	1.0 ug/g dry	60.4	109	-	-
Mercury	0.1 ug/g dry	<0.1	0.4	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	1.0 ug/g dry	9.5	10.9	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.5 ug/g dry	<0.5	<0.5	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	1.0 ug/g dry	21.7	28.5	-	-
Zinc	1.0 ug/g dry	39.2	80.9	-	-

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 25-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP190-3	TP200-3		
	Sample Date:	25-Jul-13	25-Jul-13		
	Sample ID:	1330261-01	1330261-02		
	MDL/Units	Soil	Soil		
Chloromethane	0.20 ug/g dry	<0.20	<0.20	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dibromoethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethylene, total	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Butyl Ketone (2-Hexanone)	2.00 ug/g dry	<2.00	<2.00	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2,4-Trichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-

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Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 25-Jul-2013

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	MDL/Units	Client ID:	TP190-3	TP200-3	-	-
		Sample Date:	25-Jul-13	25-Jul-13		
		Sample ID:	1330261-01	1330261-02	-	-
			Soil	Soil	-	-
1,3,5-Trimethylbenzene	0.05 ug/g dry		<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry		<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry		<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry		<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry		<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate		95.1%	103%	-	-
Dibromofluoromethane	Surrogate		69.2%	75.7%	-	-
Toluene-d8	Surrogate		82.3%	84.0%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	469	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	159	24	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	-	-
Acenaphthylene	0.02 ug/g dry	0.15	0.22	-	-
Anthracene	0.02 ug/g dry	0.12	0.23	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.22	0.44	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.27	0.48	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.27	0.52	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.11	0.21	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.09	0.22	-	-
Biphenyl	0.02 ug/g dry	0.02	<0.02	-	-
Chrysene	0.02 ug/g dry	0.24	0.49	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.02	0.06	-	-
Fluoranthene	0.02 ug/g dry	0.35	0.94	-	-
Fluorene	0.02 ug/g dry	0.04	0.05	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.09	0.22	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.02	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.02	<0.02	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.04	<0.04	-	-
Naphthalene	0.01 ug/g dry	0.03	0.02	-	-
Phenanthrene	0.02 ug/g dry	0.22	0.49	-	-
Pyrene	0.02 ug/g dry	0.33	0.82	-	-
2-Fluorobiphenyl	Surrogate	75.3%	55.8%	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Order Date: 25-Jul-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.215/ Boteler

	Client ID:	TP190-3	TP200-3	-	-
	Sample Date:	25-Jul-13	25-Jul-13	-	-
	Sample ID:	1330261-01	1330261-02	-	-
	MDL/Units	Soil	Soil	-	-
Terphenyl-d14	Surrogate	56.0%	56.2%	-	-

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.709		ug/g		53.2	50-140			
Surrogate: Terphenyl-d14	0.874		ug/g		65.5	50-140			
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						

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.50	ug/g						
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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						
1,2,4-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	3.26		ug/g		102	50-140			
Surrogate: Dibromofluoromethane	1.84		ug/g		57.4	50-140			
Surrogate: Toluene-d8	3.08		ug/g		96.2	50-140			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	16	7	ug/g dry	14			14.2	40	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	ND	1.0	ug/g dry	1.06			0.0	30	
Barium	64.9	1.0	ug/g dry	84.6			26.4	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	2.62	1.0	ug/g dry	3.01			13.8	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.0	1.0	ug/g dry	14.2			8.7	30	
Cobalt	4.26	1.0	ug/g dry	4.65			8.7	30	
Copper	10.0	1.0	ug/g dry	10.5			4.7	30	
Lead	18.4	1.0	ug/g dry	14.4			24.8	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	35	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	7.63	1.0	ug/g dry	7.93			3.8	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	1.30	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	19.3	1.0	ug/g dry	21.0			8.5	30	
Zinc	26.6	1.0	ug/g dry	25.1			6.1	30	
Physical Characteristics									
% Solids	85.0	0.1	% by Wt.	85.4			0.4	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	0.060	0.02	ug/g dry	0.078			25.4	40	
Anthracene	0.073	0.02	ug/g dry	0.114			44.4	40	
Benzo [a] anthracene	0.116	0.02	ug/g dry	0.160			32.2	40	
Benzo [a] pyrene	0.101	0.02	ug/g dry	0.140			32.3	40	
Benzo [b] fluoranthene	0.094	0.02	ug/g dry	0.113			19.0	40	
Benzo [g,h,i] perylene	0.051	0.02	ug/g dry	0.056			8.6	40	
Benzo [k] fluoranthene	0.039	0.02	ug/g dry	0.046			16.1	40	
Biphenyl	ND	0.02	ug/g dry	ND				40	
Chrysene	0.110	0.02	ug/g dry	0.146			27.7	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	0.233	0.02	ug/g dry	0.340			37.3	40	
Fluorene	ND	0.02	ug/g dry	0.032			0.0	40	
Indeno [1,2,3-cd] pyrene	0.047	0.02	ug/g dry	0.054			15.3	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	0.149	0.02	ug/g dry	0.264			55.8	40	QR-01
Pyrene	0.194	0.02	ug/g dry	0.280			36.3	40	
Surrogate: 2-Fluorobiphenyl	0.822		ug/g dry	ND	55.0	50-140			
Surrogate: Terphenyl-d14	0.900		ug/g dry	ND	60.3	50-140			
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	

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	0.20	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	0.554	0.05	ug/g dry	0.698			23.1	50	
Hexane	ND	0.05	ug/g dry	ND			0.0	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Butyl Ketone (2-Hexanone)	ND	2.00	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			0.0	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	0.385	0.05	ug/g dry	0.406			5.2	50	
Vinyl chloride	ND	0.02	ug/g dry	ND			0.0	50	
m,p-Xylenes	0.595	0.05	ug/g dry	0.761			24.4	50	
o-Xylene	ND	0.05	ug/g dry	ND			0.0	50	
Surrogate: 4-Bromofluorobenzene	2.37		ug/g dry	ND	106	50-140			
Surrogate: Dibromofluoromethane	1.73		ug/g dry	ND	77.2	50-140			
Surrogate: Toluene-d8	1.82		ug/g dry	ND	81.3	50-140			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	199	7	ug/g	ND	99.7	80-120			
Metals									
Antimony	229		ug/L	ND	91.5	70-130			
Arsenic	238		ug/L	ND	95.1	70-130			
Barium	238		ug/L	ND	95.4	70-130			
Beryllium	224		ug/L	ND	89.4	70-130			
Boron, available	3.52	0.5	ug/g	ND	70.5	70-122			
Boron	235		ug/L	ND	94.0	70-130			
Cadmium	223		ug/L	ND	89.3	70-130			
Chromium (VI)	4.8	0.2	ug/g	ND	86.0	70-130			
Chromium	229		ug/L	ND	91.6	70-130			
Cobalt	228		ug/L	ND	91.4	70-130			
Copper	234		ug/L	ND	93.6	70-130			
Lead	219		ug/L	ND	87.8	70-130			
Mercury	1.68	0.1	ug/g	ND	112	72-128			
Molybdenum	236		ug/L	ND	94.4	70-130			
Nickel	232		ug/L	ND	92.6	70-130			
Selenium	228		ug/L	ND	91.0	70-130			
Silver	207		ug/L	ND	82.8	70-130			
Thallium	246		ug/L	ND	98.3	70-130			
Uranium	235		ug/L	ND	93.8	70-130			
Vanadium	235		ug/L	ND	93.8	70-130			
Zinc	222		ug/L	ND	88.6	70-130			
Semi-Volatiles									
Acenaphthene	0.208	0.02	ug/g	ND	111	50-140			
Acenaphthylene	0.239	0.02	ug/g	0.078	86.3	50-140			
Anthracene	0.281	0.02	ug/g	0.114	89.3	50-140			
Benzo [a] anthracene	0.320	0.02	ug/g	0.160	85.7	50-140			
Benzo [a] pyrene	0.300	0.02	ug/g	0.140	85.7	50-140			
Benzo [b] fluoranthene	0.272	0.02	ug/g	0.113	85.0	50-140			
Benzo [g,h,i] perylene	0.198	0.02	ug/g	0.056	76.1	50-140			
Benzo [k] fluoranthene	0.225	0.02	ug/g	0.046	95.9	50-140			
Biphenyl	0.299	0.02	ug/g	ND	160	50-140			QM-06
Chrysene	0.328	0.02	ug/g	0.146	97.7	50-140			
Dibenzo [a,h] anthracene	0.181	0.02	ug/g	ND	96.8	50-140			
Fluoranthene	0.413	0.02	ug/g	0.340	38.9	50-140			QM-06
Fluorene	0.258	0.02	ug/g	0.032	121	50-140			
Indeno [1,2,3-cd] pyrene	0.223	0.02	ug/g	0.054	90.2	50-140			
1-Methylnaphthalene	0.129	0.02	ug/g	ND	69.2	50-140			
2-Methylnaphthalene	0.139	0.02	ug/g	ND	74.2	50-140			
Naphthalene	0.149	0.01	ug/g	ND	80.0	50-140			
Phenanthrene	0.353	0.02	ug/g	0.264	48.0	50-140			QM-06
Pyrene	0.380	0.02	ug/g	0.280	53.2	50-140			
Surrogate: 2-Fluorobiphenyl	0.885		ug/g		59.3	50-140			
Volatiles									
Acetone	7.93	0.50	ug/g	ND	79.3	50-140			
Benzene	4.15	0.02	ug/g	ND	104	60-130			
Bromodichloromethane	3.43	0.05	ug/g	ND	85.6	60-130			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	2.48	0.05	ug/g	ND	62.0	60-130			
Bromomethane	4.43	0.05	ug/g	ND	111	50-140			
Carbon Tetrachloride	3.10	0.05	ug/g	ND	77.4	60-130			
Chlorobenzene	4.18	0.05	ug/g	ND	105	60-130			
Chloroethane	3.49	0.05	ug/g	ND	87.3	50-140			
Chloroform	4.10	0.05	ug/g	ND	103	60-130			
Chloromethane	2.96	0.20	ug/g	ND	74.0	50-140			
Dibromochloromethane	3.19	0.05	ug/g	ND	79.8	60-130			
Dichlorodifluoromethane	4.37	0.05	ug/g	ND	109	50-140			
1,2-Dibromoethane	3.92	0.05	ug/g	ND	98.1	60-130			
1,2-Dichlorobenzene	3.72	0.05	ug/g	ND	93.1	60-130			
1,3-Dichlorobenzene	3.85	0.05	ug/g	ND	96.4	60-130			
1,4-Dichlorobenzene	3.33	0.05	ug/g	ND	83.3	60-130			
1,1-Dichloroethane	2.98	0.05	ug/g	ND	74.4	60-130			
1,2-Dichloroethane	4.21	0.05	ug/g	ND	105	60-130			
1,1-Dichloroethylene	3.16	0.05	ug/g	ND	78.9	60-130			
cis-1,2-Dichloroethylene	4.63	0.05	ug/g	ND	116	60-130			
trans-1,2-Dichloroethylene	3.22	0.05	ug/g	ND	80.6	60-130			
1,2-Dichloropropane	3.63	0.05	ug/g	ND	90.7	60-130			
cis-1,3-Dichloropropylene	2.97	0.05	ug/g	ND	74.3	60-130			
trans-1,3-Dichloropropylene	2.45	0.05	ug/g	ND	61.4	60-130			
Ethylbenzene	4.30	0.05	ug/g	ND	107	60-130			
Hexane	5.02	0.05	ug/g	ND	126	60-130			
Methyl Ethyl Ketone (2-Butanone)	7.28	0.50	ug/g	ND	72.8	50-140			
Methyl Butyl Ketone (2-Hexanone)	5.58	2.00	ug/g	ND	55.8	50-140			
Methyl Isobutyl Ketone	8.61	0.50	ug/g	ND	86.1	50-140			
Methyl tert-butyl ether	7.04	0.05	ug/g	ND	70.4	50-140			
Methylene Chloride	3.84	0.05	ug/g	ND	96.0	60-130			
Styrene	4.19	0.05	ug/g	ND	105	60-130			
1,1,1,2-Tetrachloroethane	3.29	0.05	ug/g	ND	82.3	60-130			
1,1,2,2-Tetrachloroethane	3.83	0.05	ug/g	ND	95.7	60-130			
Tetrachloroethylene	4.09	0.05	ug/g	ND	102	60-130			
Toluene	4.44	0.05	ug/g	ND	111	60-130			
1,2,4-Trichlorobenzene	3.44	0.05	ug/g	ND	85.9	60-130			
1,1,1-Trichloroethane	3.10	0.05	ug/g	ND	77.6	60-130			
1,1,2-Trichloroethane	3.63	0.05	ug/g	ND	90.9	60-130			
Trichloroethylene	3.55	0.05	ug/g	ND	88.8	60-130			
Trichlorofluoromethane	2.76	0.05	ug/g	ND	69.0	50-140			
1,3,5-Trimethylbenzene	4.11	0.05	ug/g	ND	103	60-130			
Vinyl chloride	2.86	0.02	ug/g	ND	71.5	50-140			
m,p-Xylenes	7.78	0.05	ug/g	ND	97.3	60-130			
o-Xylene	4.19	0.05	ug/g	ND	105	60-130			

Certificate of Analysis

Report Date: 01-Aug-2013

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 25-Jul-2013

Client PO: 45064625

Project Description: 122510670.215/ Boteler

Qualifier Notes:

QC Qualifiers :

QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

OTTAWA ● KINGSTON ● NIAGARA ● MISSISSAUGA ● SARNIA

Page 1 of 1

Client Name: Stantec	Project Reference: 100510670 (215)	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: Jill Peters - Deelman	Quote # SOA 19609-91843-501	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: 1331 Clyde Ave Suite 400	PO #	Date Required: _____
Telephone: 613-722-4420	Email Address: jill.peters-deelman@stantec.com	

Criteria: O. Reg. 153/04 (As Amended) Table 1 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

Parcel Order Number: 1330261			Matrix	Air Volume	# of Containers	Sample Taken		PHU/BTEX	VOC'S	PAH	Metals by ICP	Hg	Cr-VI	B (HWS)				
Sample ID/Location Name		Date				Time												
1	TP 190-3	BA1457	S	/	2	July 25	PM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	250ml + vial
2	TP 200-3	BA1458	S	/	2	2013	PM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	"
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments: _____ Method of Delivery: **Walk-in**

Relinquished By (Sign): A. Waldick	Received by Driver/Depot:	Received at Lab: M/C	Verified By: M/C
Relinquished By (Print): A. Waldick	Date/Time: _____	Date/Time: July 25/13 6:21	Date/Time: July 25/13 6:42
Date/Time: 2013/07/25	Temperature: _____ °C	Temperature: 20 °C	pH Verified <input type="checkbox"/> By: N/A

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670/ Boteler
Custody: 101289

Report Date: 25-Apr-2014
Order Date: 24-Apr-2014

Order #: 1417234

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

Paracel ID	Client ID
1417234-01	MW13-13

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 25-Apr-2014

Order Date: 24-Apr-2014

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent	MOE E3056 - colourimetric	25-Apr-14	25-Apr-14
Mercury	EPA 245.1 - Cold Vapour AA	25-Apr-14	25-Apr-14
Metals, ICP-MS	EPA 200.8 - ICP-MS	25-Apr-14	25-Apr-14
PAHs by GC-MS	EPA 625 - GC-MS, extraction	24-Apr-14	25-Apr-14

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

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300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8

MISSISSAUGA
6645 Kitimat Rd, Unit #27
Mississauga, ON L5N 6J3

NIAGARA FALLS
5415 Morning Glory Cr.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 25-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	MW13-13	-	-	-
Sample Date:	24-Apr-14	-	-	-
Sample ID:	1417234-01	-	-	-
MDL/Units	Water	-	-	-

Metals

Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	3.5	-	-	-
Arsenic	1 ug/L	1	-	-	-
Barium	1 ug/L	30	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	60	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Chromium	1 ug/L	2	-	-	-
Chromium (VI)	10 ug/L	<10	-	-	-
Cobalt	0.5 ug/L	1.1	-	-	-
Copper	0.5 ug/L	4.0	-	-	-
Lead	0.1 ug/L	0.5	-	-	-
Molybdenum	0.5 ug/L	11.6	-	-	-
Nickel	1 ug/L	3	-	-	-
Selenium	1 ug/L	2	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-
Sodium	200 ug/L	24400	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	1.9	-	-	-
Vanadium	0.5 ug/L	2.9	-	-	-
Zinc	5 ug/L	7	-	-	-

Semi-Volatiles

Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	0.09	-	-	-
Anthracene	0.01 ug/L	0.07	-	-	-
Benzo [a] anthracene	0.01 ug/L	0.15	-	-	-
Benzo [a] pyrene	0.01 ug/L	0.12	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	0.14	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	0.10	-	-	-
Biphenyl	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	0.16	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-

Certificate of Analysis

Report Date: 25-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	MW13-13	-	-	-
	Sample Date:	24-Apr-14	-	-	-
	Sample ID:	1417234-01	-	-	-
	MDL/Units	Water	-	-	-
Fluoranthene	0.01 ug/L	0.19	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	0.09	-	-	-
Pyrene	0.01 ug/L	0.17	-	-	-
2-Fluorobiphenyl	Surrogate	65.0%	-	-	-
Terphenyl-d14	Surrogate	104%	-	-	-

Certificate of Analysis

Report Date: 25-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	15.1		ug/L		75.7	50-140			
Surrogate: Terphenyl-d14	24.3		ug/L		122	50-140			

Certificate of Analysis

Report Date: 25-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
Antimony	2.70	0.5	ug/L	4.15			42.6	20	QR-01
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	25.8	1	ug/L	25.8			0.3	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	32	10	ug/L	35			8.3	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium (VI)	ND	10	ug/L	ND				20	
Chromium	18.8	1	ug/L	20.2			7.1	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	2.27	0.5	ug/L	2.20			2.9	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	1.09	0.5	ug/L	1.30			18.1	20	
Nickel	1.4	1	ug/L	1.4			3.4	20	
Selenium	3.9	1	ug/L	4.4			12.4	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	22400	200	ug/L	23400			4.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	0.3	0.1	ug/L	0.3			23.1	20	QR-01
Vanadium	5.17	0.5	ug/L	5.56			7.3	20	
Zinc	14	5	ug/L	13			0.9	20	

Certificate of Analysis

Report Date: 25-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	2.98	0.1	ug/L	ND	99.4	78-137			
Antimony	50.8		ug/L	4.15	93.4	80-120			
Arsenic	62.7		ug/L	0.8	124	80-120			QM-07
Barium	75.8		ug/L	25.8	100	80-120			
Beryllium	58.8		ug/L	0.01	118	80-120			
Boron	79		ug/L	35	87.2	80-120			
Cadmium	51.9		ug/L	ND	104	80-120			
Chromium (VI)	190	10	ug/L	ND	95.0	70-130			
Chromium	68.4		ug/L	20.2	96.5	80-120			
Cobalt	55.5		ug/L	0.11	111	80-120			
Copper	56.9		ug/L	2.20	109	80-120			
Lead	57.1		ug/L	0.03	114	80-120			
Molybdenum	49.3		ug/L	1.30	96.0	80-120			
Nickel	57.4		ug/L	1.4	112	80-120			
Selenium	51.5		ug/L	0.6	102	80-120			
Silver	45.1		ug/L	0.17	89.9	80-120			
Sodium	1270		ug/L	298	96.8	80-120			
Thallium	56.5		ug/L	0.05	113	80-120			
Uranium	60.3		ug/L	0.3	120	80-120			
Vanadium	56.0		ug/L	5.56	101	80-120			
Zinc	68		ug/L	13	110	80-120			
Semi-Volatiles									
Acenaphthene	4.42	0.05	ug/L	ND	88.4	50-140			
Acenaphthylene	4.46	0.05	ug/L	ND	89.3	50-140			
Anthracene	4.48	0.01	ug/L	ND	89.5	50-140			
Benzo [a] anthracene	4.42	0.01	ug/L	ND	88.5	50-140			
Benzo [a] pyrene	5.15	0.01	ug/L	ND	103	50-140			
Benzo [b] fluoranthene	4.18	0.05	ug/L	ND	83.5	50-140			
Benzo [g,h,i] perylene	2.85	0.05	ug/L	ND	57.1	50-140			
Benzo [k] fluoranthene	4.61	0.05	ug/L	ND	92.1	50-140			
Biphenyl	3.78	0.05	ug/L	ND	75.5	50-140			
Chrysene	4.78	0.05	ug/L	ND	95.6	50-140			
Dibenzo [a,h] anthracene	2.80	0.05	ug/L	ND	56.1	50-140			
Fluoranthene	4.87	0.01	ug/L	ND	97.4	50-140			
Fluorene	4.23	0.05	ug/L	ND	84.7	50-140			
Indeno [1,2,3-cd] pyrene	2.88	0.05	ug/L	ND	57.6	50-140			
1-Methylnaphthalene	4.31	0.05	ug/L	ND	86.2	50-140			
2-Methylnaphthalene	4.42	0.05	ug/L	ND	88.4	50-140			
Naphthalene	4.03	0.05	ug/L	ND	80.6	50-140			
Phenanthrene	4.51	0.05	ug/L	ND	90.2	50-140			
Pyrene	5.07	0.01	ug/L	ND	101	50-140			
Surrogate: 2-Fluorobiphenyl	15.6		ug/L		78.2	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 25-Apr-2014

Order Date: 24-Apr-2014

Qualifier Notes:

QC Qualifiers :

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

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

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

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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Page 1 of 1

Client Name: <u>Stake Consulting Ltd</u>	Project Reference: <u>12251470 - Btcler</u>	TAT: <input type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Jill Peters - Dechman / Breakation</u>	Quote # <u>City of Ottawa SPA - 01 910 - 91843 - 501</u>	<input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> 1 Day
Address: <u>Suite 400, 1331 Clyde Avenue Ottawa, ON K2C 3G4</u>	PO # <u>122510670, 1225</u>	Date Required: <u>24 hr CASH TAT</u>
Telephone: <u>613-722-4420</u>	Email Address: <u>jill.peters-dechman@stake.com breakation@stake.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 3 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**

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
				Date	Time														
1 MW13-13 BCF263	GW	X	4	2-14/4/24	14:10			✓	✓	✓									
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments: - all metals bottles field filled. Method of Delivery: WALKIN

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot:	Received By (Sign): <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>J. W. Ken</u>	Date/Time:	Date/Time: <u>24/11/24</u>	Date/Time: <u>Apr 24/14 3:29</u>
Date/Time: <u>21/4/24 15:00</u>	Temperature: _____ °C	Temperature: <u>11.4</u> °C	pH Verified By: <u>[Signature]</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670/ Boteler
Custody: 101290

Report Date: 25-Apr-2014
Order Date: 24-Apr-2014

Order #: 1417229

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

Paracel ID	Client ID
1417229-01	MW14-1-F
1417229-02	MW14-1
1417229-03	MW14-3-F
1417229-04	MW14-3
1417229-05	MW13-10-F

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 25-Apr-2014

Order Date: 24-Apr-2014

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PAHs by GC-MS	EPA 625 - GC-MS, extraction	24-Apr-14	25-Apr-14

Certificate of Analysis

Report Date: 25-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	MW14-1-F	MW14-1	MW14-3-F	MW14-3
Sample Date:	24-Apr-14	24-Apr-14	24-Apr-14	24-Apr-14
Sample ID:	1417229-01	1417229-02	1417229-03	1417229-04
MDL/Units	Water	Water	Water	Water

Semi-Volatiles

	MDL/Units	MW14-1-F	MW14-1	MW14-3-F	MW14-3
Acenaphthene	0.05 ug/L	<0.05 [2]	0.27	<0.05 [2]	<0.05
Acenaphthylene	0.05 ug/L	<0.05 [2]	0.92	<0.05 [2]	0.12
Anthracene	0.01 ug/L	<0.01 [2]	1.40	0.03 [2]	0.13
Benzo [a] anthracene	0.01 ug/L	<0.01 [2]	4.79	<0.01 [2]	0.52
Benzo [a] pyrene	0.01 ug/L	<0.01 [2]	4.48	<0.01 [2]	0.50
Benzo [b] fluoranthene	0.05 ug/L	<0.05 [2]	6.55	<0.05 [2]	0.54
Benzo [g,h,i] perylene	0.05 ug/L	<0.05 [2]	1.12	<0.05 [2]	0.10
Benzo [k] fluoranthene	0.05 ug/L	<0.05 [2]	3.78	<0.05 [2]	0.27
Biphenyl	0.05 ug/L	<0.05 [2]	<0.05	<0.05 [2]	<0.05
Chrysene	0.05 ug/L	<0.05 [2]	5.67	<0.05 [2]	0.60
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05 [2]	0.34	<0.05 [2]	<0.05
Fluoranthene	0.01 ug/L	<0.01 [2]	9.91	0.04 [2]	0.83
Fluorene	0.05 ug/L	<0.05 [2]	0.39	<0.05 [2]	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05 [2]	1.25	<0.05 [2]	0.10
1-Methylnaphthalene	0.05 ug/L	<0.05 [2]	0.06	<0.05 [2]	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05 [2]	0.07	<0.05 [2]	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10 [2]	0.13	<0.10 [2]	<0.10
Naphthalene	0.05 ug/L	<0.05 [2]	0.12	<0.05 [2]	<0.05
Phenanthrene	0.05 ug/L	<0.05 [2]	4.66	<0.05 [2]	0.24
Pyrene	0.01 ug/L	<0.01 [2]	9.03	0.04 [2]	0.76
2-Fluorobiphenyl	Surrogate	92.1% [2]	68.4%	67.1% [2]	65.1%
Terphenyl-d14	Surrogate	123% [2]	91.8%	107% [2]	109%

Certificate of Analysis

Report Date: 25-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	MW13-10-F	-	-	-
Sample Date:	24-Apr-14	-	-	-
Sample ID:	1417229-05	-	-	-
MDL/Units	Water	-	-	-

Semi-Volatiles

Acenaphthene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Acenaphthylene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Anthracene	0.01 ug/L	<0.05 [1] [2]	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.05 [1] [2]	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.05 [1] [2]	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Biphenyl	0.05 ug/L	<0.25 [1] [2]	-	-	-
Chrysene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Fluoranthene	0.01 ug/L	<0.05 [1] [2]	-	-	-
Fluorene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.25 [1] [2]	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.25 [1] [2]	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.50 [1] [2]	-	-	-
Naphthalene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Phenanthrene	0.05 ug/L	<0.25 [1] [2]	-	-	-
Pyrene	0.01 ug/L	<0.05 [1] [2]	-	-	-
2-Fluorobiphenyl	Surrogate	78.1% [1] [2]	-	-	-
Terphenyl-d14	Surrogate	125% [1] [2]	-	-	-

Certificate of Analysis

Report Date: 25-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	15.1		ug/L		75.7	50-140			
Surrogate: Terphenyl-d14	24.3		ug/L		122	50-140			

Certificate of Analysis

Report Date: 25-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 24-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	4.42	0.05	ug/L	ND	88.4	50-140			
Acenaphthylene	4.46	0.05	ug/L	ND	89.3	50-140			
Anthracene	4.48	0.01	ug/L	ND	89.5	50-140			
Benzo [a] anthracene	4.42	0.01	ug/L	ND	88.5	50-140			
Benzo [a] pyrene	5.15	0.01	ug/L	ND	103	50-140			
Benzo [b] fluoranthene	4.18	0.05	ug/L	ND	83.5	50-140			
Benzo [g,h,i] perylene	2.85	0.05	ug/L	ND	57.1	50-140			
Benzo [k] fluoranthene	4.61	0.05	ug/L	ND	92.1	50-140			
Biphenyl	3.78	0.05	ug/L	ND	75.5	50-140			
Chrysene	4.78	0.05	ug/L	ND	95.6	50-140			
Dibenzo [a,h] anthracene	2.80	0.05	ug/L	ND	56.1	50-140			
Fluoranthene	4.87	0.01	ug/L	ND	97.4	50-140			
Fluorene	4.23	0.05	ug/L	ND	84.7	50-140			
Indeno [1,2,3-cd] pyrene	2.88	0.05	ug/L	ND	57.6	50-140			
1-Methylnaphthalene	4.31	0.05	ug/L	ND	86.2	50-140			
2-Methylnaphthalene	4.42	0.05	ug/L	ND	88.4	50-140			
Naphthalene	4.03	0.05	ug/L	ND	80.6	50-140			
Phenanthrene	4.51	0.05	ug/L	ND	90.2	50-140			
Pyrene	5.07	0.01	ug/L	ND	101	50-140			
Surrogate: 2-Fluorobiphenyl	15.6		ug/L		78.2	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 25-Apr-2014

Order Date: 24-Apr-2014

Qualifier Notes:

Sample Qualifiers :

- 1 : Elevated Reporting Limits due to limited sample volume.
- 2 : Sample was filtered through a 0.45 um membrane filter prior to extraction/analysis.

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.

Client Name: <u>Stanke Consulting Ltd.</u>	Project Reference: <u>122510670 - Botek</u>	TAT: <input type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Jill Peters-Dechman / Breaka Thom</u>	Quote # <u>-</u>	<input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> 1 Day
Address: <u>Suite 400, 1351 Clyde Avenue Ottawa, ON K2C 3G4</u>	PO # <u>122510670, 225</u>	Date Required: <u>24 hr within TAT</u>
Telephone: <u>613-722-4420</u>	Email Address: <u>jill.peters-dechman@stanke.com breaka.thom@stanke.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 3 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: <u>1417229</u>			Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)								
Sample ID/Location Name		Date				Time																
1	MW14-1-F BCF258	GW	X	2	2014/04/24	12:30				✓											lab filter + analyse (Decant)	
2	MW14-1 BCF259	GW	X	2	2014/04/24	12:35				✓												analyse as is to solvent
3	MW14-3-F BCF260	GW	X	2	2014/04/24	13:15				✓												lab filter + analyse (Decant)
4	MW14-3 BCF261	GW	X	2	2014/04/24	13:20				✓												analyse as is to solvent
5	MW13-10-F BCF262	GW	X	1	2014/04/24	13:50				✓												lab filter + analyse (only fill 1/4 bottle)
6																						(Decant)
7																						
8																						
9																						
10																						

Comments: -any questions contact Jill Peters-Dechman ; MW13-10-F has liquid sample taken.

Method of Delivery: Walk-in

Relinquished By (Sign): <u>J. Urban</u>	Received by Driver/Depot:	Received at Lab: <u>[Signature]</u>	Verified By: <u>MIC</u>
Relinquished By (Print): <u>J. Urban</u>	Date/Time: _____	Date/Time: <u>2014/04/24 3:00</u>	Date/Time: <u>Apr 24/14 3:28</u>
Date/Time: <u>2014/04/24 15:00</u>	Temperature: _____ °C	Temperature: <u>15.1</u> °C	pH Verified <input type="checkbox"/> By: <u>N/A</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670/ Boteler
Custody: 17323

Report Date: 22-Apr-2014
Order Date: 11-Apr-2014

Order #: 1415265

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

Parcel ID	Client ID
1415265-01	MW14-2
1415265-02	MW14-A
1415265-03	MW13-10
1415265-04	Field Blank
1415265-05	Trip Blank
1415265-06	MW13-13

Approved By:



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

Certificate of Analysis

Report Date: 22-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent	MOE E3056 - colourimetric	16-Apr-14	16-Apr-14
Mercury	EPA 245.1 - Cold Vapour AA	15-Apr-14	15-Apr-14
Metals, ICP-MS	EPA 200.8 - ICP-MS	17-Apr-14	17-Apr-14
PAHs by GC-MS	EPA 625 - GC-MS, extraction	15-Apr-14	16-Apr-14
PHC F1	CWS Tier 1 - P&T GC-FID	15-Apr-14	15-Apr-14
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	14-Apr-14	15-Apr-14
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	15-Apr-14	15-Apr-14

P: 1-800-749-1947
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 300-2319 St. Laurent Blvd.
 Ottawa, ON K1G 4J8

MISSISSAUGA
 6845 Kitimat Rd. Unit #27
 Mississauga, ON L5N 6J3

NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 22-Apr-2014

Order Date: 11-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	MW14-2	MW14-A	MW13-10	Field Blank
Sample Date:	11-Apr-14	11-Apr-14	11-Apr-14	11-Apr-14
Sample ID:	1415265-01	1415265-02	1415265-03	1415265-04
MDL/Units	Water	Water	Water	Water

Metals

Element	MDL/Units	MW14-2	MW14-A	MW13-10	Field Blank
Mercury	0.1 ug/L	<0.1	<0.1	-	-
Antimony	0.5 ug/L	<0.5	<0.5	-	-
Arsenic	1 ug/L	1	1	-	-
Barium	1 ug/L	134	135	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	-	-
Boron	10 ug/L	257	269	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Chromium	1 ug/L	6	4	-	-
Chromium (VI)	10 ug/L	<10	<10	-	-
Cobalt	0.5 ug/L	2.2	5.4	-	-
Copper	0.5 ug/L	3.7	4.0	-	-
Lead	0.1 ug/L	0.1	0.1	-	-
Molybdenum	0.5 ug/L	3.6	3.4	-	-
Nickel	1 ug/L	9	9	-	-
Selenium	1 ug/L	19	14	-	-
Silver	0.1 ug/L	<0.1	<0.1	-	-
Sodium	200 ug/L	197000	202000	-	-
Thallium	0.1 ug/L	0.2	<0.1	-	-
Uranium	0.1 ug/L	9.0	9.1	-	-
Vanadium	0.5 ug/L	10.4	5.5	-	-
Zinc	5 ug/L	11	12	-	-

Volatiles

Element	MDL/Units	MW14-2	MW14-A	MW13-10	Field Blank
Acetone	5.0 ug/L	<5.0	<5.0	-	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	-	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	-	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	-	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	-	<1.0
Chloroform	0.5 ug/L	1.2	1.2	-	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	-	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	<0.5

Certificate of Analysis

Report Date: 22-Apr-2014

Order Date: 11-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	MW14-2	MW14-A	MW13-10	Field Blank
	Sample Date:	11-Apr-14	11-Apr-14	11-Apr-14	11-Apr-14
	Sample ID:	1415265-01	1415265-02	1415265-03	1415265-04
	MDL/Units	Water	Water	Water	Water
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	-	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	-	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	<0.5

Certificate of Analysis

Report Date: 22-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID: Sample Date: Sample ID:	MW14-2 11-Apr-14 1415265-01	MW14-A 11-Apr-14 1415265-02	MW13-10 11-Apr-14 1415265-03	Field Blank 11-Apr-14 1415265-04
	MDL/Units	Water	Water	Water	Water
o-Xylene	0.5 ug/L	<0.5	<0.5	-	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	<0.5
4-Bromofluorobenzene	Surrogate	104%	105%	-	104%
Dibromofluoromethane	Surrogate	98.7%	102%	-	99.7%
Toluene-d8	Surrogate	103%	102%	-	103%

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	<100
F1 + F2 PHCs	125 ug/L	<125	<125	-	<125
F3 + F4 PHCs	200 ug/L	<200	<200	-	<200

Semi-Volatiles

Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05 [1]	-
Acenaphthylene	0.05 ug/L	0.06	<0.05	<0.05 [1]	-
Anthracene	0.01 ug/L	0.02	0.03	0.06 [1]	-
Benzo [a] anthracene	0.01 ug/L	0.09	0.09	0.34 [1]	-
Benzo [a] pyrene	0.01 ug/L	<0.01	0.05	0.14 [1]	-
Benzo [b] fluoranthene	0.05 ug/L	0.08	0.10	0.37 [1]	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	0.42 [1]	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	0.05	0.18 [1]	-
Biphenyl	0.05 ug/L	0.22	<0.05	0.42 [1]	-
Chrysene	0.05 ug/L	0.08	0.07	0.32 [1]	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05 [1]	-
Fluoranthene	0.01 ug/L	0.14	0.16	0.31 [1]	-
Fluorene	0.05 ug/L	0.06	<0.05	0.09 [1]	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	0.17 [1]	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05 [1]	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05 [1]	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10 [1]	-
Naphthalene	0.05 ug/L	<0.05	<0.05	0.43 [1]	-
Phenanthrene	0.05 ug/L	0.19	0.13	0.30 [1]	-
Pyrene	0.01 ug/L	0.13	0.13	0.43 [1]	-
2-Fluorobiphenyl	Surrogate	81.4%	85.9%	76.2% [1]	-
Terphenyl-d14	Surrogate	99.2%	104%	80.8% [1]	-

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Report Date: 22-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Order Date: 11-Apr-2014

Client ID:	Trip Blank	MW13-13	-	-
Sample Date:	11-Apr-14	11-Apr-14	-	-
Sample ID:	1415265-05	1415265-06	-	-
MDL/Units	Water	Water	-	-

Volatiles

Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID: Sample Date: Sample ID: MDL/Units	Trip Blank 11-Apr-14 1415265-05 Water	MW13-13 11-Apr-14 1415265-06 Water	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	104%	105%	-	-
Dibromofluoromethane	Surrogate	100%	102%	-	-
Toluene-d8	Surrogate	103%	103%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-
F1 + F2 PHCs	125 ug/L	<125	<125	-	-
F3 + F4 PHCs	200 ug/L	<200	<200	-	-

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	17.4		ug/L		86.9	50-140			
Surrogate: Terphenyl-d14	19.6		ug/L		98.1	50-140			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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						
1,1,1-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						
1,3,5-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	82.9		ug/L		104	50-140			
Surrogate: Dibromofluoromethane	78.9		ug/L		98.6	50-140			
Surrogate: Toluene-d8	82.3		ug/L		103	50-140			

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
Antimony	ND	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	ND	1	ug/L	ND			0.0	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium (VI)	ND	10	ug/L	ND				20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND			0.0	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	ND	0.5	ug/L	ND			0.0	20	
Nickel	ND	1	ug/L	ND			0.0	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	ND	200	ug/L	ND			0.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	ND	0.1	ug/L	ND			0.0	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
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	

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	
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	82.0		ug/L	ND	102	50-140			
Surrogate: Dibromofluoromethane	82.1		ug/L	ND	103	50-140			
Surrogate: Toluene-d8	81.8		ug/L	ND	102	50-140			

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2090	25	ug/L	ND	105	68-117			
F2 PHCs (C10-C16)	1730	100	ug/L	ND	96.2	60-140			
F3 PHCs (C16-C34)	3460	100	ug/L	ND	93.1	60-140			
F4 PHCs (C34-C50)	2480	100	ug/L	ND	100	60-140			
Metals									
Mercury	2.80	0.1	ug/L	ND	93.5	78-137			
Antimony	48.0		ug/L	ND	101	80-120			
Arsenic	53.7		ug/L	ND	107	80-120			
Barium	51.5		ug/L	ND	103	80-120			
Beryllium	55.4		ug/L	0.007	111	80-120			
Boron	53		ug/L	6	93.7	80-120			
Cadmium	56.9		ug/L	ND	114	80-120			
Chromium (VI)	207	10	ug/L	ND	104	70-130			
Chromium	58.1		ug/L	0.6	115	80-120			
Cobalt	54.7		ug/L	0.0003	109	80-120			
Copper	53.7		ug/L	0.007	107	80-120			
Lead	51.9		ug/L	0.02	104	80-120			
Molybdenum	50.8		ug/L	ND	102	80-120			
Nickel	56.3		ug/L	0.003	113	80-120			
Selenium	52.8		ug/L	ND	106	80-120			
Silver	55.6		ug/L	ND	111	80-120			
Sodium	1210		ug/L	13	120	80-120			
Thallium	52.0		ug/L	ND	104	80-120			
Uranium	50.9		ug/L	ND	102	80-120			
Vanadium	59.6		ug/L	0.10	119	80-120			
Zinc	51		ug/L	ND	104	80-120			
Semi-Volatiles									
Acenaphthene	4.31	0.05	ug/L	ND	86.2	50-140			
Acenaphthylene	4.15	0.05	ug/L	ND	82.9	50-140			
Anthracene	4.05	0.01	ug/L	ND	81.0	50-140			
Benzo [a] anthracene	4.01	0.01	ug/L	ND	80.1	50-140			
Benzo [a] pyrene	3.30	0.01	ug/L	ND	65.9	50-140			
Benzo [b] fluoranthene	4.69	0.05	ug/L	ND	93.8	50-140			
Benzo [g,h,i] perylene	3.94	0.05	ug/L	ND	78.8	50-140			
Benzo [k] fluoranthene	6.08	0.05	ug/L	ND	122	50-140			
Biphenyl	3.57	0.05	ug/L	ND	71.4	50-140			
Chrysene	4.43	0.05	ug/L	ND	88.6	50-140			
Dibenzo [a,h] anthracene	3.22	0.05	ug/L	ND	64.4	50-140			
Fluoranthene	4.32	0.01	ug/L	ND	86.4	50-140			
Fluorene	4.22	0.05	ug/L	ND	84.3	50-140			
Indeno [1,2,3-cd] pyrene	3.51	0.05	ug/L	ND	70.2	50-140			
1-Methylnaphthalene	3.48	0.05	ug/L	ND	69.7	50-140			
2-Methylnaphthalene	3.71	0.05	ug/L	ND	74.2	50-140			
Naphthalene	3.43	0.05	ug/L	ND	68.6	50-140			
Phenanthrene	4.04	0.05	ug/L	ND	80.8	50-140			
Pyrene	4.36	0.01	ug/L	ND	87.3	50-140			
Surrogate: 2-Fluorobiphenyl	19.1		ug/L		95.7	50-140			

Volatiles

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

WWW.PARACELLABS.COM

OTTAWA
300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8

MISSISSAUGA
6845 Kitimat Rd. Unit #27
Mississauga, ON L5N 6J3

NIAGARA FALLS
5415 Morning Glory Cr.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	86.2	5.0	ug/L	ND	86.2	50-140			
Benzene	39.3	0.5	ug/L	ND	98.3	50-140			
Bromodichloromethane	40.2	0.5	ug/L	ND	100	50-140			
Bromoform	43.8	0.5	ug/L	ND	109	50-140			
Bromomethane	43.1	0.5	ug/L	ND	108	50-140			
Carbon Tetrachloride	43.6	0.2	ug/L	ND	109	50-140			
Chlorobenzene	40.7	0.5	ug/L	ND	102	50-140			
Chloroethane	42.7	1.0	ug/L	ND	107	50-140			
Chloroform	39.9	0.5	ug/L	ND	99.7	50-140			
Chloromethane	37.3	3.0	ug/L	ND	93.3	50-140			
Dibromochloromethane	44.6	0.5	ug/L	ND	112	50-140			
Dichlorodifluoromethane	43.0	1.0	ug/L	ND	108	50-140			
1,2-Dibromoethane	38.2	0.2	ug/L	ND	95.6	50-140			
1,2-Dichlorobenzene	43.0	0.5	ug/L	ND	107	50-140			
1,3-Dichlorobenzene	43.0	0.5	ug/L	ND	107	50-140			
1,4-Dichlorobenzene	43.0	0.5	ug/L	ND	108	50-140			
1,1-Dichloroethane	49.8	0.5	ug/L	ND	124	50-140			
1,2-Dichloroethane	38.6	0.5	ug/L	ND	96.5	50-140			
1,1-Dichloroethylene	39.3	0.5	ug/L	ND	98.3	50-140			
cis-1,2-Dichloroethylene	38.8	0.5	ug/L	ND	97.0	50-140			
trans-1,2-Dichloroethylene	38.4	0.5	ug/L	ND	96.1	50-140			
1,2-Dichloropropane	34.2	0.5	ug/L	ND	85.6	50-140			
cis-1,3-Dichloropropylene	37.3	0.5	ug/L	ND	93.3	50-140			
trans-1,3-Dichloropropylene	37.0	0.5	ug/L	ND	92.5	50-140			
Ethylbenzene	40.3	0.5	ug/L	ND	101	50-140			
Hexane	29.5	1.0	ug/L	ND	73.7	50-140			
Methyl Ethyl Ketone (2-Butanone)	85.3	5.0	ug/L	ND	85.3	50-140			
Methyl Butyl Ketone (2-Hexanone)	83.0	10.0	ug/L	ND	83.0	50-140			
Methyl Isobutyl Ketone	85.7	5.0	ug/L	ND	85.7	50-140			
Methyl tert-butyl ether	117	2.0	ug/L	ND	117	50-140			
Methylene Chloride	39.6	5.0	ug/L	ND	99.0	50-140			
Styrene	39.0	0.5	ug/L	ND	97.6	50-140			
1,1,1,2-Tetrachloroethane	41.7	0.5	ug/L	ND	104	50-140			
1,1,2,2-Tetrachloroethane	38.4	0.5	ug/L	ND	95.9	50-140			
Tetrachloroethylene	38.8	0.5	ug/L	ND	97.0	50-140			
Toluene	39.5	0.5	ug/L	ND	98.7	50-140			
1,1,1-Trichloroethane	39.6	0.5	ug/L	ND	98.9	50-140			
1,1,2-Trichloroethane	37.5	0.5	ug/L	ND	93.8	50-140			
Trichloroethylene	37.3	0.5	ug/L	ND	93.4	50-140			
Trichlorofluoromethane	41.3	1.0	ug/L	ND	103	50-140			
1,3,5-Trimethylbenzene	40.5	0.5	ug/L	ND	101	50-140			
Vinyl chloride	31.4	0.5	ug/L	ND	78.6	50-140			
m,p-Xylenes	91.0	0.5	ug/L	ND	114	50-140			
o-Xylene	40.5	0.5	ug/L	ND	101	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 22-Apr-2014

Order Date: 11-Apr-2014

Qualifier Notes:

Login Qualifiers :

Sample - Filtered and preserved by Paracel upon receipt at the laboratory - Hg and CrVI

Applies to samples: MW14-2, MW14-A

Sample - Not submitted in the correct container - Sub-sampled for Hg and CrVI

Applies to samples: MW14-2, MW14-A

Sample Qualifiers :

1 : Elevated Reporting Limits due to limited sample volume.

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.

CCME PHC additional information:

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

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Page 1 of 1

Client Name: <u>Stantec Consulting Ltd.</u>	Project Reference: <u>122510670 - Bateleur Perm</u>	TAT: <input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day
Contact Name: <u>Jill Peters - Dechman</u>	Quote # <u>City of Ottawa SA# -01 910-91843-501</u>	<input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day
Address: <u>Suite 400, 1331 Clyde Avenue Ottawa ON K2C 3G4</u>	PO # <u>122510670, 225</u>	Date Required: _____
Telephone: <u>613-722-4420</u>	Email Address: <u>Jill.peters-dechman@stantec.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 1 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: <u>1415265</u>		Matrix	Air Volume	# of Containers	Sample Taken		PbCFE-F4	VOCs	PAHs	metals by ICP	Hg / CrVI				
Sample ID/Location Name					Date	Time									
1	MW14-a BCF208	GW	x	5	2-14/04/11	10:45	✓	✓	✓	✓	✓				
2	MW14-A BCF209	GW	x	5	2-14/04/11	10:45	✓	✓	✓	✓	✓				
3	MW13-10 BCF210	GW	x	1	2-14/04/11	10:15			✓			- half	PAN	batch filled	
4	Field Blank BCF211	water	x	3	2-14/04/11	10:40	✓	✓							
5	Trip Blank BCF212	water	x	2	2-14/04/11	-	✓	✓							
6	MW13-13 BCF213	GW	x	3	2-14/04/11	10:30	✓	✓				- half	PAN	batch filled	
7															
8															
9															
10															

Comments: - all metals samples field filters
- metals by ICP = O. Reg. 153 show list metals → include Hg + CrVI (subsample & filter/preserve) per J.H. - MJC

Method of Delivery: Walk-in

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot:	Received at Lab: <u>MJC</u>	Verified By: <u>MJC</u>
Relinquished By (Print): <u>J. Weber</u>	Date/Time: _____	Date/Time: <u>Apr 11/14 12:33</u>	Date/Time: <u>Apr 11/14 3:25</u>
Date/Time: <u>2014/04/11 12:36</u>	Temperature: _____ °C	Temperature: <u>8.14 °C</u>	pH Verified: <u>By MJC</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670/ Boteler
Custody: 101220

Report Date: 22-Apr-2014
Order Date: 11-Apr-2014

Order #: 1415263

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

Parcel ID	Client ID
1415263-01	MW13-2
1415263-02	MW13-1
1415263-03	MW14-3
1415263-04	MW14-1
1415263-05	MW13-14
1415263-06	MW13-11
1415263-07	Field Blank

Approved By:



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

Certificate of Analysis

Report Date: 22-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent	MOE E3056 - colourimetric	16-Apr-14	16-Apr-14
Mercury	EPA 245.1 - Cold Vapour AA	15-Apr-14	15-Apr-14
Metals, ICP-MS	EPA 200.8 - ICP-MS	17-Apr-14	17-Apr-14
PAHs by GC-MS	EPA 625 - GC-MS, extraction	15-Apr-14	16-Apr-14
PHC F1	CWS Tier 1 - P&T GC-FID	11-Apr-14	15-Apr-14
PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	14-Apr-14	15-Apr-14
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	15-Apr-14	15-Apr-14

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Certificate of Analysis

Report Date: 22-Apr-2014

Order Date: 11-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	MW13-2	MW13-1	MW14-3	MW14-1
Sample Date:	10-Apr-14	10-Apr-14	10-Apr-14	10-Apr-14
Sample ID:	1415263-01	1415263-02	1415263-03	1415263-04
MDL/Units	Water	Water	Water	Water

Metals

Element	MDL/Units	MW13-2	MW13-1	MW14-3	MW14-1
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	3	1
Barium	1 ug/L	52	87	53	52
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	73	73	331	195
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	7	8	22	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	3.0	3.1	1.7	<0.5
Copper	0.5 ug/L	3.9	3.8	11.9	11.4
Lead	0.1 ug/L	0.1	0.2	0.3	0.4
Molybdenum	0.5 ug/L	3.3	9.0	12.3	5.2
Nickel	1 ug/L	4	7	9	4
Selenium	1 ug/L	9	3	9	3
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	64600	579000	2420000	639000
Thallium	0.1 ug/L	0.1	<0.1	0.1	<0.1
Uranium	0.1 ug/L	4.6	2.5	16.3	3.9
Vanadium	0.5 ug/L	16.1	10.5	23.7	4.7
Zinc	5 ug/L	9	8	13	9

Volatiles

Element	MDL/Units	MW13-2	MW13-1	MW14-3	MW14-1
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 22-Apr-2014

Order Date: 11-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	MW13-2	MW13-1	MW14-3	MW14-1
	Sample Date:	10-Apr-14	10-Apr-14	10-Apr-14	10-Apr-14
	Sample ID:	1415263-01	1415263-02	1415263-03	1415263-04
	MDL/Units	Water	Water	Water	Water
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 22-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID: Sample Date: Sample ID:	MW13-2 10-Apr-14 1415263-01	MW13-1 10-Apr-14 1415263-02	MW14-3 10-Apr-14 1415263-03	MW14-1 10-Apr-14 1415263-04
	MDL/Units	Water	Water	Water	Water
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	110%	111%	113%	114%
Dibromofluoromethane	Surrogate	118%	118%	120%	113%
Toluene-d8	Surrogate	115%	114%	115%	114%

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<119 [4]
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	3050 [4]
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	1760 [4]
F1 + F2 PHCs	125 ug/L	<125	<125	<125	-
F1 + F2 PHCs	144 ug/L	-	-	-	<144
F3 + F4 PHCs	200 ug/L	<200	<200	<200	-
F3 + F4 PHCs	238 ug/L	-	-	-	4810

Semi-Volatiles

Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	1.05 [4]
Acenaphthylene	0.05 ug/L	<0.05	<0.05	0.13	2.88 [4]
Anthracene	0.01 ug/L	<0.01	<0.01	0.14	5.43 [4]
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	0.68	18.1 [4]
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	0.62	17.3 [4]
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	0.89	31.0 [4]
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	0.42	11.9 [4]
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	0.60	12.3 [4]
Biphenyl	0.05 ug/L	<0.05	<0.05	<0.05	0.12 [4]
Chrysene	0.05 ug/L	<0.05	<0.05	0.75	21.9 [4]
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	3.42 [4]
Fluoranthene	0.01 ug/L	<0.01	<0.01	1.12	44.0 [4]
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	1.49 [4]
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	0.33	10.4 [4]
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	0.27 [4]
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	0.26 [4]
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	0.53 [4]
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	0.49 [4]
Phenanthrene	0.05 ug/L	<0.05	<0.05	0.33	18.8 [4]
Pyrene	0.01 ug/L	<0.01	<0.01	1.05	38.4 [4]

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID:	MW13-2	MW13-1	MW14-3	MW14-1
	Sample Date:	10-Apr-14	10-Apr-14	10-Apr-14	10-Apr-14
	Sample ID:	1415263-01	1415263-02	1415263-03	1415263-04
	MDL/Units	Water	Water	Water	Water
2-Fluorobiphenyl	Surrogate	77.5%	84.9%	87.6%	74.3% [4]
Terphenyl-d14	Surrogate	97.1%	102%	103%	90.5% [4]

Certificate of Analysis

Report Date: 22-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Client ID:	MW13-14	MW13-11	Field Blank	-
Sample Date:	10-Apr-14	10-Apr-14	10-Apr-14	-
Sample ID:	1415263-05	1415263-06	1415263-07	-
MDL/Units	Water	Water	Water	-

Metals

Mercury	0.1 ug/L	<0.1	<0.1	-	-
Antimony	0.5 ug/L	<0.5	<0.5	-	-
Arsenic	1 ug/L	<1	1	-	-
Barium	1 ug/L	63	49	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	-	-
Boron	10 ug/L	81	182	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Chromium	1 ug/L	16	9	-	-
Chromium (VI)	10 ug/L	<10	<10	-	-
Cobalt	0.5 ug/L	1.0	1.1	-	-
Copper	0.5 ug/L	5.0	4.0	-	-
Lead	0.1 ug/L	0.1	0.1	-	-
Molybdenum	0.5 ug/L	6.7	4.1	-	-
Nickel	1 ug/L	6	11	-	-
Selenium	1 ug/L	1	18	-	-
Silver	0.1 ug/L	<0.1	<0.1	-	-
Sodium	200 ug/L	778000	354000	-	-
Thallium	0.1 ug/L	<0.1	<0.1	-	-
Uranium	0.1 ug/L	8.7	5.9	-	-
Vanadium	0.5 ug/L	22.2	13.1	-	-
Zinc	5 ug/L	6	15	-	-

Volatiles

Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID: Sample Date: Sample ID:	MW13-14 10-Apr-14 1415263-05 Water	MW13-11 10-Apr-14 1415263-06 Water	Field Blank 10-Apr-14 1415263-07 Water	- - - -
	MDL/Units				
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-

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Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

	Client ID: Sample Date: Sample ID:	MW13-14 10-Apr-14 1415263-05 Water	MW13-11 10-Apr-14 1415263-06 Water	Field Blank 10-Apr-14 1415263-07 Water	- - - -
	MDL/Units				
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	104%	105%	105%	-
Dibromofluoromethane	Surrogate	100%	100%	100%	-
Toluene-d8	Surrogate	103%	104%	104%	-

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-
F1 + F2 PHCs	125 ug/L	<125	<125	<125	-
F3 + F4 PHCs	200 ug/L	<200	<200	<200	-

Semi-Volatiles

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

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

		Client ID:	MW13-14	MW13-11	Field Blank	
		Sample Date:	10-Apr-14	10-Apr-14	10-Apr-14	-
		Sample ID:	1415263-05	1415263-06	1415263-07	-
	MDL/Units		Water	Water	Water	-
2-Fluorobiphenyl	Surrogate		86.5%	81.5%	-	-
Terphenyl-d14	Surrogate		100%	102%	-	-

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Biphenyl	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	17.4		ug/L		86.9	50-140			
Surrogate: Terphenyl-d14	19.6		ug/L		98.1	50-140			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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						
1,1,1-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						
1,3,5-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	88.4		ug/L		110	50-140			
Surrogate: Dibromofluoromethane	83.0		ug/L		104	50-140			
Surrogate: Toluene-d8	90.1		ug/L		113	50-140			

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
Antimony	ND	0.5	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Barium	ND	1	ug/L	ND			0.0	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium (VI)	ND	10	ug/L	ND				20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND			0.0	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Molybdenum	ND	0.5	ug/L	ND			0.0	20	
Nickel	ND	1	ug/L	ND			0.0	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	ND	200	ug/L	ND			0.0	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	ND	0.1	ug/L	ND			0.0	20	
Vanadium	ND	0.5	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
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	25.0	0.5	ug/L	23.8			4.8	30	
trans-1,2-Dichloroethylene	1.45	0.5	ug/L	1.28			12.5	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	

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	283	0.5	ug/L	282			0.3	30	GEN-14
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	94.0	0.5	ug/L	90.3			4.1	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND				30	
Vinyl chloride	1.64	0.5	ug/L	1.43			13.7	30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	91.6		ug/L	ND	114	50-140			
Surrogate: Dibromofluoromethane	83.6		ug/L	ND	105	50-140			
Surrogate: Toluene-d8	91.1		ug/L	ND	114	50-140			

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1870	25	ug/L	ND	93.5	68-117			
F2 PHCs (C10-C16)	1730	100	ug/L	ND	96.2	60-140			
F3 PHCs (C16-C34)	3460	100	ug/L	ND	93.1	60-140			
F4 PHCs (C34-C50)	2480	100	ug/L	ND	100	60-140			
Metals									
Mercury	2.80	0.1	ug/L	ND	93.5	78-137			
Antimony	48.0		ug/L	ND	101	80-120			
Arsenic	53.7		ug/L	ND	107	80-120			
Barium	51.5		ug/L	ND	103	80-120			
Beryllium	55.4		ug/L	0.007	111	80-120			
Boron	53		ug/L	6	93.7	80-120			
Cadmium	56.9		ug/L	ND	114	80-120			
Chromium (VI)	207	10	ug/L	ND	104	70-130			
Chromium	58.1		ug/L	0.6	115	80-120			
Cobalt	54.7		ug/L	0.0003	109	80-120			
Copper	53.7		ug/L	0.007	107	80-120			
Lead	51.9		ug/L	0.02	104	80-120			
Molybdenum	50.8		ug/L	ND	102	80-120			
Nickel	56.3		ug/L	0.003	113	80-120			
Selenium	52.8		ug/L	ND	106	80-120			
Silver	55.6		ug/L	ND	111	80-120			
Sodium	1210		ug/L	13	120	80-120			
Thallium	52.0		ug/L	ND	104	80-120			
Uranium	50.9		ug/L	ND	102	80-120			
Vanadium	59.6		ug/L	0.10	119	80-120			
Zinc	51		ug/L	ND	104	80-120			
Semi-Volatiles									
Acenaphthene	4.31	0.05	ug/L	ND	86.2	50-140			
Acenaphthylene	4.15	0.05	ug/L	ND	82.9	50-140			
Anthracene	4.05	0.01	ug/L	ND	81.0	50-140			
Benzo [a] anthracene	4.01	0.01	ug/L	ND	80.1	50-140			
Benzo [a] pyrene	3.30	0.01	ug/L	ND	65.9	50-140			
Benzo [b] fluoranthene	4.69	0.05	ug/L	ND	93.8	50-140			
Benzo [g,h,i] perylene	3.94	0.05	ug/L	ND	78.8	50-140			
Benzo [k] fluoranthene	6.08	0.05	ug/L	ND	122	50-140			
Biphenyl	3.57	0.05	ug/L	ND	71.4	50-140			
Chrysene	4.43	0.05	ug/L	ND	88.6	50-140			
Dibenzo [a,h] anthracene	3.22	0.05	ug/L	ND	64.4	50-140			
Fluoranthene	4.32	0.01	ug/L	ND	86.4	50-140			
Fluorene	4.22	0.05	ug/L	ND	84.3	50-140			
Indeno [1,2,3-cd] pyrene	3.51	0.05	ug/L	ND	70.2	50-140			
1-Methylnaphthalene	3.48	0.05	ug/L	ND	69.7	50-140			
2-Methylnaphthalene	3.71	0.05	ug/L	ND	74.2	50-140			
Naphthalene	3.43	0.05	ug/L	ND	68.6	50-140			
Phenanthrene	4.04	0.05	ug/L	ND	80.8	50-140			
Pyrene	4.36	0.01	ug/L	ND	87.3	50-140			
Surrogate: 2-Fluorobiphenyl	19.1		ug/L		95.7	50-140			

Volatiles

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

WWW.PARACELLABS.COM

OTTAWA
300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8

MISSISSAUGA
6845 Kitimat Rd. Unit #27
Mississauga, ON L5N 6J3

NIAGARA FALLS
5415 Morning Glory Cr.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 22-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 11-Apr-2014

Client PO: 45064625

Project Description: 122510670/ Boteler

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acetone	99.4	5.0	ug/L	ND	99.4	50-140			
Benzene	40.5	0.5	ug/L	ND	101	50-140			
Bromodichloromethane	41.6	0.5	ug/L	ND	104	50-140			
Bromoform	42.4	0.5	ug/L	ND	106	50-140			
Bromomethane	50.6	0.5	ug/L	ND	127	50-140			
Carbon Tetrachloride	40.5	0.2	ug/L	ND	101	50-140			
Chlorobenzene	40.0	0.5	ug/L	ND	100	50-140			
Chloroethane	48.7	1.0	ug/L	ND	122	50-140			
Chloroform	41.1	0.5	ug/L	ND	103	50-140			
Chloromethane	43.6	3.0	ug/L	ND	109	50-140			
Dibromochloromethane	44.2	0.5	ug/L	ND	111	50-140			
Dichlorodifluoromethane	51.1	1.0	ug/L	ND	128	50-140			
1,2-Dibromoethane	40.1	0.2	ug/L	ND	100	50-140			
1,2-Dichlorobenzene	40.0	0.5	ug/L	ND	100	50-140			
1,3-Dichlorobenzene	40.2	0.5	ug/L	ND	101	50-140			
1,4-Dichlorobenzene	41.8	0.5	ug/L	ND	105	50-140			
1,1-Dichloroethane	41.1	0.5	ug/L	ND	103	50-140			
1,2-Dichloroethane	40.9	0.5	ug/L	ND	102	50-140			
1,1-Dichloroethylene	43.8	0.5	ug/L	ND	109	50-140			
cis-1,2-Dichloroethylene	142	0.5	ug/L	114	71.0	50-140			
trans-1,2-Dichloroethylene	43.6	0.5	ug/L	2.24	103	50-140			
1,2-Dichloropropane	38.8	0.5	ug/L	ND	96.9	50-140			
cis-1,3-Dichloropropylene	38.8	0.5	ug/L	ND	96.9	50-140			
trans-1,3-Dichloropropylene	37.9	0.5	ug/L	ND	94.7	50-140			
Ethylbenzene	40.0	0.5	ug/L	ND	100	50-140			
Hexane	41.0	1.0	ug/L	ND	103	50-140			
Methyl Ethyl Ketone (2-Butanone)	84.4	5.0	ug/L	ND	84.4	50-140			
Methyl Butyl Ketone (2-Hexanone)	100	10.0	ug/L	ND	100	50-140			
Methyl Isobutyl Ketone	102	5.0	ug/L	ND	102	50-140			
Methyl tert-butyl ether	100	2.0	ug/L	ND	100	50-140			
Methylene Chloride	42.4	5.0	ug/L	ND	106	50-140			
Styrene	39.6	0.5	ug/L	ND	99.0	50-140			
1,1,1,2-Tetrachloroethane	39.4	0.5	ug/L	ND	98.6	50-140			
1,1,2,2-Tetrachloroethane	41.4	0.5	ug/L	ND	104	50-140			
Tetrachloroethylene	38.8	0.5	ug/L	ND	97.0	50-140			
Toluene	39.3	0.5	ug/L	ND	98.2	50-140			
1,1,1-Trichloroethane	37.9	0.5	ug/L	ND	94.7	50-140			
1,1,2-Trichloroethane	39.9	0.5	ug/L	ND	99.7	50-140			
Trichloroethylene	37.3	0.5	ug/L	ND	93.4	50-140			
Trichlorofluoromethane	46.6	1.0	ug/L	ND	116	50-140			
1,3,5-Trimethylbenzene	39.4	0.5	ug/L	ND	98.6	50-140			
Vinyl chloride	39.8	0.5	ug/L	6.68	82.8	50-140			
m,p-Xylenes	90.7	0.5	ug/L	ND	113	50-140			
o-Xylene	40.2	0.5	ug/L	ND	100	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670/ Boteler

Report Date: 22-Apr-2014

Order Date: 11-Apr-2014

Qualifier Notes:

Login Qualifiers :

Sample - Filtered and preserved by Paracel upon receipt at the laboratory - Hg and CrVI

Applies to samples: MW13-2, MW13-1, MW14-3, MW14-1, MW13-14, MW13-11

Sample - Not submitted in the correct container - Sub-sampled for Hg and CrVI

Applies to samples: MW13-2, MW13-1, MW14-3, MW14-1, MW13-14, MW13-11

Sample Qualifiers :

4 : Water sample included significant sediment amount that was included in extraction process. This is expected to result in reduced accuracy of the reported result.

QC Qualifiers :

GEN-14 : This result exceeds the calibration range of the instrument. The result may be biased.

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.

CCME PHC additional information:

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

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Page 1 of 1

Client Name: <u>Stantec Consulting Ltd</u>	Project Reference: <u>122510670 - Batch Burn</u>	TAT: <input checked="" type="checkbox"/> Regular [] 3 Day
Contact Name: <u>Jill Peters-Dedman</u>	Quote # <u>City of Ottawa SOA# - 01910-91843-501</u>	[] 2 Day [] 1 Day
Address: <u>Suite 400, 1351 Clyde Avenue Ottawa, ON K2C 3K4</u>	PO # <u>122510670, 225</u>	Date Required: _____
Telephone: <u>615-722-4430</u>	Email Address: <u>jill.peters-dedman@stantec.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 1 [] 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**

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP			B (HWS)
				Date	Time				Hg	CrVI	B	
1 MW13-2 BCF 201	GW	X	5	2014/04/10	11:00	✓	✓	✓	✓	✓	✓	
2 MW13-1 BCF 202	GW	X	5	2014/04/10	12:15	✓	✓	✓	✓	✓	✓	
3 MW14-3 BCF 203	GW	X	5	2014/04/10	14:20	✓	✓	✓	✓	✓	✓	
4 MW14-1 BCF 204	GW	X	5	2014/04/10	17:45	✓	✓	✓	✓	✓	✓	
5 MW13-14 BCF 205	GW	X	5	2014/04/10	17:00	✓	✓	✓	✓	✓	✓	
6 MW13-11 BCF 206	GW	X	5	2014/04/10	15:45	✓	✓	✓	✓	✓	✓	
7 Field Blank BCF 207	Water	X	3	2014/04/10	15:10	✓	✓					
8 Trip Blank	Water	X	2	2014/03/31	-	✓	✓					Don't analyze Trip Blank (exceeded hold time) per Jill
10 * Sub-sample = filter/preserve for Hg & CrVI per Jill. -mjc												

Comments: - Metals by ICP = O. Reg 153 short list metals; MW14-1 metals was NOT field filtered + preservative - all other metals are field filtered. *was rinsed out.* Method of Delivery: Walk-in

Relinquished By (Sign): <u>J. Urban</u>	Received by Driver/Depot:	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>J. Urban</u>	Date/Time: _____	Date/Time: <u>Apr 11/14</u>	Date/Time: <u>Apr 11/14 3:18</u>
Date/Time: <u>2014/04/11 10:22</u>	Temperature: _____ °C	Temperature: <u>9.2 °C 10:24</u>	pH Verified [] By: <u>[Signature]</u>

Certificate of Analysis

Stantec Consulting Ltd. (Ottawa)

1331 Clyde Avenue Suite 400
Ottawa, ON K2C 3G4
Attn: Jill Peters-Dechman

Phone: (613) 722-4420
Fax: (613) 738-0721

Client PO: 45064625
Project: 122510670.225/ Boteler
Custody: 15710

Report Date: 8-Apr-2014
Order Date: 3-Apr-2014

Revised Report **Order #: 1414215**

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

Parcel ID	Client ID
1414215-01	BH14-5 SS1
1414215-02	BH14-4 SS2
1414215-03	BH14-6 SS1

Approved By:



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

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 08-Apr-2014

Order Date: 3-Apr-2014

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PAHs by GC-MS	EPA 8270 - GC-MS, extraction	3-Apr-14	7-Apr-14
Solids, %	Gravimetric, calculation	3-Apr-14	3-Apr-14

P: 1-800-749-1947
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OTTAWA
300-2319 St. Laurent Blvd.
Ottawa, ON K1G 4J8

MISSISSAUGA
6845 Kitimat Rd. Unit #27
Mississauga, ON L5N 6J3

NIAGARA FALLS
5415 Morning Glory Crt.
Niagara Falls, ON L2J 0A3

SARNIA
123 Christina St. N.
Sarnia, ON N7T 5T7

Certificate of Analysis

Report Date: 08-Apr-2014

 Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 3-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Client ID:	BH14-5 SS1	BH14-4 SS2	BH14-6 SS1	-
Sample Date:	05-Mar-14	05-Mar-14	05-Mar-14	-
Sample ID:	1414215-01	1414215-02	1414215-03	-
MDL/Units	Soil	Soil	Soil	-

Physical Characteristics

% Solids	0.1 % by Wt.	81.8	89.5	84.0	-
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Semi-Volatiles

Acenaphthene	0.02 ug/g dry	0.15	4.24	<0.02	-
Acenaphthylene	0.02 ug/g dry	0.37	21.7	0.06	-
Anthracene	0.02 ug/g dry	0.80	16.6	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	1.50	29.8	0.02	-
Benzo [a] pyrene	0.02 ug/g dry	1.16	24.1	<0.02	-
Benzo [b] fluoranthene	0.02 ug/g dry	2.06	62.8	0.05	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.73	15.4	<0.02	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.91	18.7	<0.02	-
Biphenyl	0.02 ug/g dry	0.08	3.31	<0.02	-
Chrysene	0.02 ug/g dry	1.63	35.0	0.02	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.23	4.95	<0.02	-
Fluoranthene	0.02 ug/g dry	4.96	153	0.06	-
Fluorene	0.02 ug/g dry	0.29	12.8	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.66	14.1	0.04	-
1-Methylnaphthalene	0.02 ug/g dry	0.12	9.87	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	0.20	8.62	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.32	18.5	<0.04	-
Naphthalene	0.01 ug/g dry	0.31	4.32	<0.01	-
Phenanthrene	0.02 ug/g dry	3.25	127	0.03	-
Pyrene	0.02 ug/g dry	4.12	123	0.06	-
2-Fluorobiphenyl	Surrogate	80.4%	138%	93.3%	-
Terphenyl-d14	Surrogate	82.5%	121%	68.6%	-

Certificate of Analysis

Report Date: 08-Apr-2014

Client: **Stantec Consulting Ltd. (Ottawa)**

Order Date: 3-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Biphenyl	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.842		ug/g		63.2	50-140			
Surrogate: Terphenyl-d14	0.985		ug/g		73.9	50-140			

Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Report Date: 08-Apr-2014

Order Date: 3-Apr-2014

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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Physical Characteristics

% Solids	90.8	0.1	% by Wt.	91.2			0.5	25	
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Certificate of Analysis

Client: **Stantec Consulting Ltd. (Ottawa)**

Report Date: 08-Apr-2014

Client PO: 45064625

Project Description: 122510670.225/ Boteler

Order Date: 3-Apr-2014

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	0.119	0.02	ug/g	ND	71.5	50-140			
Acenaphthylene	0.147	0.02	ug/g	ND	88.3	50-140			
Anthracene	0.142	0.02	ug/g	ND	85.0	50-140			
Benzo [a] anthracene	0.137	0.02	ug/g	ND	82.5	50-140			
Benzo [a] pyrene	0.119	0.02	ug/g	ND	71.4	50-140			
Benzo [b] fluoranthene	0.166	0.02	ug/g	ND	99.9	50-140			
Benzo [g,h,i] perylene	0.144	0.02	ug/g	ND	86.2	50-140			
Benzo [k] fluoranthene	0.169	0.02	ug/g	ND	102	50-140			
Biphenyl	0.199	0.02	ug/g	ND	119	50-140			
Chrysene	0.136	0.02	ug/g	ND	81.4	50-140			
Dibenzo [a,h] anthracene	0.142	0.02	ug/g	ND	85.1	50-140			
Fluoranthene	0.194	0.02	ug/g	ND	116	50-140			
Fluorene	0.107	0.02	ug/g	ND	63.9	50-140			
Indeno [1,2,3-cd] pyrene	0.147	0.02	ug/g	ND	87.9	50-140			
1-Methylnaphthalene	0.110	0.02	ug/g	ND	65.7	50-140			
2-Methylnaphthalene	0.136	0.02	ug/g	ND	81.4	50-140			
Naphthalene	0.115	0.01	ug/g	ND	69.1	50-140			
Phenanthrene	0.138	0.02	ug/g	ND	82.8	50-140			
Pyrene	0.195	0.02	ug/g	ND	117	50-140			
Surrogate: 2-Fluorobiphenyl	0.885		ug/g		66.4	50-140			

Certificate of Analysis

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Project Description: 122510670.225/ Boteler

Report Date: 08-Apr-2014

Order Date: 3-Apr-2014

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report includes Sample ID's which have been switched between sample data.

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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Client Name: <u>Stantec Consulting Ltd.</u>	Project Reference: <u>122510170</u>	<input checked="" type="checkbox"/> Regular <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input type="checkbox"/> 1 Day Date Required: _____
Contact Name: <u>Jill Peters-Dachman</u>	Quote #: <u>City of Ottawa SOA - 01910-41843-501</u>	
Address: <u>Suite 400, 1531 Clyde Avenue Ottawa, ON K2C 0G5</u>	PO #: <u>122510170, 225</u>	
Telephone: <u>416-722-4420</u>	Email Address: <u>jill.peters-dachman@stantec.com</u>	

Criteria: O. Reg. 153/04 (As Amended) Table 1 RSC Filing O. Reg. 558/00 PWQG 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

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		TCLP PAHS	Bulk PAH	Revised Apr 3/14	2 x 120 ml
				Date	Time				
1 BH14-4 SS2 BCF165	Soil	Y	2	2-14-05	16:30	✓	⊗		
2 BH14-5 SS1 BCF166	Soil	Y	2	2-14-05	15:30	✓	⊗		
3 BH14-6 SS1 BCF167	Soil	Y	2	2-14-05	16:00	✓	⊗		
4									
5									
6									
7									
8									
9									
10									

[Signature]
Apr 3/14 2:19pm

Comments: - any questions, please contact Jill Peters-Dachman, thank.

Method of Delivery:
Walk-in

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <i>M/C</i>	Verified By: <i>M/C</i>
Relinquished By (Print): <u>J. Urban</u>	Date/Time: _____	Date/Time: <u>Mar 7/14 5:44</u>	Date/Time: <u>Mar 7/14 5:51</u>
Date/Time: <u>2014/03/07 17:40</u>	Temperature: _____ °C	Temperature: <u>10</u> °C	Lab Verified By: <u>AP</u>