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Phase II Environmental Site Assessment

403 Richmond Road and 389 Roosevelt Avenue
City of Ottawa, Ontario

Prepared For

Starwood Group Inc.

April 7, 2022

Report: PE4744-2

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the Phase II Property addressed 403 Richmond Road and 389 Roosevelt Avenue, in the Ottawa, Ontario. The purpose of the Phase II ESA was to address the Areas of Potential Environmental Concern identified on the Phase II Property.

TA drilling program was conducted by Stantec in 2017, which consisted of placing three (3) boreholes on the Phase II Property (403 Richmond Road). All three boreholes were instrumented with groundwater monitoring wells. The general soil profile encountered during the field program consisted of a pavement structure overlying fill material consisting of clayey sand to sandy clay with gravel, followed by a silty sand layer, underlain by interbedded shale and limestone bedrock. The bedrock was encountered during the drilling program at depths ranging from approximately 0.97 to 1.07mbgs.

Three (3) soil samples, including a duplicate sample, were submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, Fractions F_1-F_4), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and/or metals (including hexavalent chromium and mercury). Analytical results identified hexane, xylenes, PHCs (F_4), lead and several PAH parameter concentrations in excess of the selected MECP Table 1 and/or Table 7 Residential Standards.

Groundwater samples from monitoring wells MW17-1, MW17-2 and MW17-3 were collected by Stantec during the interim of February 16 to 28 of 2017, and analyzed for VOCs, BTEX, PHCs, Metals (including Hg and CrVI), and PAHs. The analytical results identified BTEX, PHCs, PAHs and VOCs in the groundwater samples in excess of the MECP Table 1 and/or Table 2 Standards. Supplemental groundwater testing was conducted by Paterson in April of 2018, September of 2019 and in March of 2022 to re-assess the groundwater conditions. No free product or petroleum hydrocarbon sheen was noted on the purge water during the groundwater sampling events in 2018, 2019 or 2022. Based on the latest analytical results, all of the analyzed groundwater results were in compliance with the MECP Table 1 and Table 7 Standards.

Recommendations

Soil

Based on the findings of the Phase II ESA, the overburden material on the Phase II ESA property is impacted with BTEX (xylenes), PHCs (F_4), VOCs (hexane), metals (lead) and PAHs exceeding the MECP Table 1 and/or Table 7 Residential Standards.

Prior to redevelopment of the Phase II Property a soil remediation program will be required. At this time, all soil leaving the Phase II property will need to be disposed of at a licensed waste facility.

A TCLP sample will be required prior to landfill disposal. More information can be provided in this regard prior to remediation.

Monitoring Wells

If the monitoring wells installed on the Phase II Property are not going to be used in the future, or will be destroyed during site redevelopment, they should be abandoned according to Ontario Regulation 903.

1.0 INTRODUCTION

At the request of Starwood Properties Inc., Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment at 403 Richmond Road and 389 Roosevelt Avenue, in the City of Ottawa, Ontario. The purpose of this Phase II ESA has been to address areas of potential environmental concern (APECs) identified on the Phase II Property, during the Phase I ESA conducted by Paterson in April of 2022.

1.1 Site Description

Address:	403 Richmond Road and 389 Roosevelt Avenue, Ottawa, Ontario
PINs:	04017-0001 and 04017-0002
Location:	The Phase II Property is located at the northeast corner of the Richmond Road and Roosevelt Avenue intersection, in the City of Ottawa, Ontario. Refer to Figure 1 - Key Plan in the Figures section following the text.
Latitude and Longitude:	45° 23’ 27.8" N, 75° 45' 24.8" W

Site Description:

Configuration:	Irregular.
Site Area:	2,590 m^2 (approximate).
Zoning:	TM – Traditional Mainstreet Zone.

1.2 Property Ownership

Paterson was engaged to conduct this Phase II-ESA by Mr. Bruce Greenberg of Starwood Group Inc. The head office of Starwood Group Inc. is located at 188 Eglinton Avenue East, Suite 800, Toronto, Ontario. The Starwood Group Inc. can be reached by telephone at (416) 482-4822.

1.3 Current and Proposed Future Uses

The Phase II Property is currently occupied by a funeral home with associated vehicular parking and a 2-storey residential dwelling. It is our understanding that the Phase II Property will be redeveloped for mixed-use purposes.

1.4 Applicable Site Condition Standard

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

- ❒ Coarse-grained soil conditions
- ❒ Generic site conditions for shallow soils
- ❒ Non-potable groundwater conditions
- ❒ Residential land use

Section 35 of O.Reg. 153/04 does apply to the Phase II Property in that the property, and the properties within the 250 m study area does not rely upon potable groundwater.

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

Section 43.1 of O.Reg. 153/04 does apply to the Phase II Property in that the property is a Shallow Soil property.

The proposed use of the Phase II Property is residential; therefore, the Residential Standards have been selected for the purpose of this Phase II ESA.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is located at the northeast corner of the Richmond Road and Roosevelt Avenue intersection, in the City of Ottawa, Ontario. The site is situated an urban area consisting of both residential and commercial land uses.

The southern portion of the Phase II Property is occupied by a funeral home with associated parking, while the northern portion is occupied by a 2-storey residential dwelling.

The site is relatively flat and at the grade of Richmond Road and Roosevelt Avenue. Site drainage mainly consists of sheet flow to catch basins along Richmond Road and Roosevelt Avenue with some infiltration on the landscaped area along the south-western, north-eastern property boundaries. The regional topography slopes down in a north-westerly/northerly direction towards the Ottawa River.

2.2 Past Investigations

Stantec Consulting Ltd. (Stantec) completed a Phase II-ESA to address historical off-site PCAs; a former retail fuel outlet and dry-cleaners, which resulted in APECs at the southern half of the Phase I Property (403 Richmond Road) in March of 2017. The field program consisted of three (3) boreholes placed on the southwestern and northern portions of the property, all of which were instrumented with monitoring wells.

Soil samples were submitted for petroleum hydrocarbons (PHC, F1-F4), polycyclic aromatic hydrocarbons (PAHs), metals and volatile organic compounds (VOCs). Test results identified PHC (F4), VOCs (hexane and xylenes), several PAHs and/or metal (lead) in excess of the MEPC Table 7 Residential Standards in all of the soil samples analyzed.

Groundwater samples were analyzed for PAHs, PHCs, metal and VOCs (included the BTEX parameters). Based on the test results, several parameter concentrations, specifically, PAHs at MW17-1, PHC and sodium at MW17-2 and BTEX at MW17-3, were in excess of the MECP Table 7 Standards.

Based on the result of the 2017 Phase II ESA, further work was recommended to delineate the extent of the soils and groundwater impacts identified on-site.

In September 2019, Paterson completed a supplement groundwater testing program. All three (3) groundwater monitoring wells were retested for the parameters that had previously exceeded the MECP Standards. With the exception of the latest groundwater sample from MW17-1, all of the groundwater samples were in compliance with the applicable standards. Benzo(a)pyrene concentration at MW17-1 exceeded the standard.

In 2022, Paterson completed a Phase I ESA for 403 Richmond Road and 389 Roosevelt Avenue. Based on the findings of the Phase I ESA, several on-and off-site PCAs were considered to represent APECs on the Phase I Property.

Table 1. Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 1: Former Car Dealership	South-western portion of the Phase I Property	PCA 52 – *"Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems,"*	On-site	BTEX PHCs (F_1-F_4)	Soil and Groundwater
APEC 2: Fill Material of Unknown Quality	Throughout the parking area of the Phase I property	PCA 30 – "*Importation of Fill Material of Unknown Quality,"*	On-site	PAHs Metals Mercury (Hg) Hexavalent Chromium (CrVI)	Soil
APEC 3: Pad Mounted Transformer	Northwest corner of the parking area.	PCA 55 – *"Transformer Manufacturing, Processing and Use"*	On-site	BTEX PCBs PHCs (F_1-F_4)	Soil
APEC 4: Former Retail fuel outlet and automotive service garage	Southwestern portion of the Phase I Property	PCA 28 – "*Gasoline and associated products stored in fixed tanks,"* PCA 52 – *"Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems,"*	Off-site	BTEX PHCs (F_1-F_4)	Groundwater

Table 1. Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 5: Former Dry Cleaners	Southeastern portion of the Phase I Property	PCA 37 - *"Operation of Dry Cleaning Equipment (where chemicals are used),"*	Off-site	VOCs	Groundwater
APEC 6[1]: Application of Road Salt	Within the parking areas of the Phase I property	Other: Application of road salt for the safety of vehicular or pedestrian traffic under conditions of snow or ice	On-site	EC SAR	Soil

1 – In accordance with Section 49.1 of O.Reg. 153/04 standards are deemed to be met if an applicable site condition standard is exceeded at a property solely because the qualified person has determined that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. The exemption outlined in Section 49.1 is being relied upon with respect to the Phase II ESA property.

Although not identified as a specific PCA in Table 1, the application of deicing salts for vehicular and pedestrian safety is also considered to represent an APEC (APEC 6) on the Phase I ESA Property.

Based on the findings of the Phase I ESA, it is considered likely that road salt was applied to the surface of the walkways, paved access lane and parking lot on the northern portion of the 403 Richmond Road for the safety of vehicular and pedestrian traffic under conditions of ice and/or snow.

According to Section 49.1 of O.Reg. 153/04, if an applicable site condition standard is exceeded at a property solely because of the following reason, the applicable site condition standard is deemed not to be exceeded for the purpose of Part XV.1 of the Act: "The qualified person has determined, based on a phase one environmental site assessment or a phase two environmental site assessment, that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both."

In accordance with Section 49.1 of O.Reg. 153/04, any EC and SAR concentrations on the RSC Property that exceed the selected MECP standards for a residential/institutional land use are deemed not to be exceeded for the purpose of Part XV.1 of the Act. This exemption is being relied on for APEC 6.

The APECs are shown on Drawing PE4744-1R–Site Plan, while the corresponding PCAs are shown in red on Drawing PE4744-2R – Surrounding Land Use Plan, in the Figures section of this report.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was conducted by Stantec in February of 2017. The field program consisted of drilling 3 boreholes to address the APECs identified on the Phase II Property. All of the boreholes were cored into the bedrock and completed with monitoring well installations. Boreholes were drilled to a maximum depth of 4.42m below the ground surface (mbgs).

Paterson completed a supplemental groundwater sampling program in 2019 and in March of 2022, to assess the groundwater conditions beneath the Phase II Property.

This Phase II ESA report includes details of the past subsurface investigation completed by Stantec and the supplemental groundwater sampling programs completed by Paterson in September of 2019 and the most recent event in March of 2022.

3.2 Media Investigated

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

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

According to the Geological Survey of Canada website, the bedrock in the area of the Phase I Property is reported to consist of interbedded limestone and dolomite of the Gull River Formation.

The overburden thickness of ranges from 2 to 5 m and consists of plain till. Groundwater is expected to flow in a northwesterly direction towards the Ottawa River.

Based on the 2017 subsurface program conducted by Stantec, the soil profile on-site generally consisted of fill material, followed by silty sand, underlain by limestone and shale interbedded. Bedrock was encountered at approximately 1 mbgs.

Fill Placement

Based on the previous building on-site and findings of the Stantec Phase II ESA, fill material of unknown quality is present on the commercial portion of the site, and as such, represents an APEC on the Phase I Property.

Water Bodies and Areas of Natural Significance

No areas of natural significance or water bodies were identified on the Phase I Property or on properties within the Phase I Study Area.

Drinking Water Wells

No potable water wells were identified on the Phase I Property during the well records search and nor are they expected to be present on-site.

Existing Buildings and Structures

The southern portion of the Phase I Property is occupied by a chapel and funeral parlour. The eastern wing/original funeral parlour was constructed in 1901, with additions built in 1958 (chapel) and circa 1967 (front entrance). The funeral parlour consists of three (3) levels – a basement, main floor and a partial second level. The exterior is finished in stucco and a flat style roof, with a stone and mortar foundation.

The northern portion of the Phase I Property is occupied by 2-storey residential dwelling that was construction prior to 1928 and a private garage that was constructed circa 2000. The exterior of the dwelling is finished in red brick with a sloped shingle style roof and a stone and mortar foundation.

Subsurface Structures and Utilities

The Phase I Property is situated in a municipally serviced area. Underground utility services on the Phase I Property include natural gas, water and sewer services, which enters the Phase I Property from Richmond Road and Roosevelt

Avenue. With the exceptions of the basement levels of both of the buildings, groundwater monitoring wells and underground utilities, there are no other subsurface structures on the Phase I Property.

Neighbouring Land Use

The Phase I Property is situated in an urban area that is primarily used for commercial offices, retailers and restaurants along Richmond Road with residential use on the neighbouring streets north and south of Richmond Road.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Section 7.1 of this report, the on and off-site PCAs that were considered to result in APECs on the Phase I Property are summarized in Table 3 with their respective locations and contaminants of potential concern (CPCs) on the Phase I Property. The remaining off-site PCAs were not determined to represent APECs on the Phase I Property, based on the separation distances and/or orientations relative to the subject land.

Contaminants of Potential Concern

As per the APECs identified in Section 7.1, the contaminants of potential concern (CPCs) in soil and/or groundwater include:

- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- Petroleum hydrocarbons (PHCs, Fractions F_1-F_4);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Volatile organic compounds (VOCs); and
- Metals plus Mercury (Hg), and Hexavalent Chromium (CrVI)

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I-ESA is considered to be sufficient to conclude that there are PCAs that have resulted in APECs on the Phase I Property. A variety of independent sources were consulted as part of this assessment, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

3.4 Deviations from Sampling and Analysis Plan

To the best of our knowledge, Stantec did not encounter any deviations from their sampling and analysis plan. Paterson did not encounter any deviations from the

Sampling and Analysis Plan during the September 2019 and arch 2022 sampling events. The Sampling and Analysis Plan is included in Appendix 1 of this report.

3.5 Impediments

To the best of our knowledge, Stantec did not encounter physical impediments during the 2017 Phase II ESA field program. No issues were encountered during the supplemental groundwater testing program.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation conducted by Stantec in 2017 consisted of drilling 3 boreholes with monitoring well installations (MW17-1, MW17-2 and MW17-3) across the northern part of the Phase II Property (403 Richmond Road). The boreholes were drilled and cored into bedrock to a depth of 4.42 m below ground surface (bgs) to intercept groundwater.

The boreholes were drilled by George Downing Estate Drilling of Hawkesbury, Ontario, under full-time supervision of Stantec personnel. The borehole locations are indicated on the attached Drawing PE4744-3 – Test Hole Location Plan.

4.2 Soil Sampling

A total of 6 soil samples and 7 core samples were obtained from the boreholes by means of split spoon sampling. Split spoon samples were taken at approximate 0.6 m intervals.

The depths at split spoon, and rock core samples were obtained from the boreholes are shown as "**1, 2**", and "**B1, B2**", respectively on the Soil Profile and Test Data Sheets.

The borehole profiles generally consist of an asphaltic concrete structure followed by fill material consisting of silty sand or clayey sand with gravel, underlain by shale and limestone interbedded.

4.3 Field Screening Measurements

Based on the Soil samples recovered at the time of sampling were placed immediately into airtight plastic bags with nominal headspace. All lumps of soil inside the bags were broken by hand, and the soil was allowed to come to room

temperature prior to conducting the vapour survey. Allowing the samples to stabilize to room temperature ensures consistency of readings between samples.

To measure the combustible soil vapours, the analyzer probe is inserted into the nominal headspace above the soil sample. An RKI Eagle 2 Gastech was used to measure the combustible and total organic vapour concentrations. The sample is agitated/manipulated gently as the measurement is taken. The peak reading registered within the first 15 seconds is recorded as the vapour measurement.

The combustible vapour readings were found to be less than 5 ppm in the soil samples obtained. These results do not indicate the potential for significant contamination from volatile contaminants. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1. The results of the vapour survey are presented on the Soil Profile and Test Data sheets.

4.4 Groundwater Monitoring Well Installation

Three (3) groundwater monitoring wells were installed on the Phase II Property as part of the subsurface investigation conducted by Stantec in 2017. The monitoring wells consisted of 50 mm diameter, Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 2 and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

TABLE 2. Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
MW17-1	67.623	4.42	1.42-4.42	0.6-4.42	0.15-0.6	Flushmount
MW17-2	67.351	4.42	1.42-4.42	0.6-4.42	0.15-0.6	Flushmount
MW17-3	67.369	4.42	1.42-4.42	0.6-4.42	0.15-0.6	Flushmount

4.5 Groundwater Sampling

Groundwater sampling protocols were followed using the MECP document entitled “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario”, dated May 1996. Groundwater samples were obtained from each monitoring well,99 using dedicated sampling equipment. Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation. Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.6 Analytical Testing

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

TABLE 3: Soil Samples Submitted and Analyzed Parameters

Sample ID	Sample Depth / Stratigraphic Unit	Parameters Analyzed					Rationale
		BTEX	PHCs (F1-F4)	VOCs	PAHs	Metals[a]	
February 9, 2017 (Stantec)							
MW17-1GS1	0-0.6m Fill	X	X	X	X	X	Assess potential soil impacts due to the former use of the site and neighbouring lands.
MW17-2GS1	0-0.6m Fill	X	X	X	X	X	
MW17-3GS1	0-0.6m Fill	X	X	X	X	X	
DUP	0-0.6m Fill				X		Duplicate soil sample (MW17-1GS1) for QA/QC purposes.

[a] Metals analysis includes Hexavalent Chromium (CRVI) and Mercury (Hg)
All soil samples were submitted as part of the Stantec Phase II ESA.

TABLE 4: Groundwater Samples Submitted and Analyzed Parameters

Sample ID	Screened Interval (m)	Parameters Analyzed					Rationale
		BTEX	PHCs (F1-F4)	VOCs	PAHs	Metals[a]	
February 16 and 17, 2017 (Stantec)							
MW17-1	1.42-4.42m Bedrock	X	X	X			Assess potential groundwater impacts due to the former use of the site and neighbouring lands.
MW17-2	1.42-4.42m Bedrock	X	X	X			
MW17-3	1.42-4.42m Bedrock	X	X	X			
February 28, 2017 (Stantec)							
MW17-1	1.42-4.42m Bedrock				X	X	Assess potential groundwater impacts due to the former use of the site and neighbouring lands.
MW17-2[b]	1.42-4.42m Bedrock		X		X	X	
MW17-3[c]	1.42-4.42m Bedrock		X		X	X	
DUP[b]	1.42-4.42m Bedrock		X		X		Duplicate groundwater sample (MW17-2) for QA/QC purposes.
DUP[d]	1.42-4.42m Bedrock					X	Duplicate groundwater sample (MW17-3) for QA/QC purposes.

TABLE 4: Groundwater Samples Submitted and Analyzed Parameters

Sample ID	Screened Interval (m)	Parameters Analyzed					Rationale
		BTEX	PHCs (F1-F4)	VOCs	PAHs	Metals[a]	
April 4, 2018 (Paterson)							
MW17-1	1.42-4.42m Bedrock	X	X	X			Confirm that the existing groundwater conditions for the analyzed parameters remain in compliance from the previous sampling event.
September 13, 2019 (Paterson)							
MW17-1-GW1	1.42-4.42m Bedrock				X		Re-assess the groundwater conditions regarding exceedances identified in the previous sampling event.
MW17-2-GW1[e]	1.42-4.42m Bedrock				X	X	
MW17-3-GW1	1.42-4.42m Bedrock	X		X			
September 24, 2019 (Paterson)							
MW17-1-GW2	1.42-4.42m Bedrock				X		Re-assess the groundwater conditions regarding exceedances identified in the previous sampling event.
March 23, 2022 (Paterson)							
MW17-1-GW	1.42-4.42m Bedrock				X		Re-assess the groundwater conditions regarding exceedances identified in the previous sampling event.
MW17-2-GW	1.42-4.42m Bedrock		X				Confirm that the existing groundwater conditions for the analyzed parameters remain in compliance from the previous sampling event.
MW17-3-GW	1.42-4.42m Bedrock	X					

[a] Metals analysis includes Hexavalent Chromium (CRVI) and Mercury (Hg)
[b] PHCs (F2-F4) only
[c] PHC, F1 only
[d] CrVI, only
[e] Sodium, only

Maxxam and Paracel Laboratories (Paracel), of Ottawa, Ontario, performed the laboratory analyses on the samples submitted by Stantec and Paterson for analytical testing, respectively. Maxxam and Paracel are members of the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA). Both analytical laboratories are accredited and certified by SCC/CALA for specific tests registered with the association.

4.7 Residue Management

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

4.8 Elevation Surveying

Boreholes were surveyed to geodetic elevations by Stantec personnel.

4.9 Quality Assurance and Quality Control Measures

For the analytical in-house quality assurance and quality control (QA/QC) measures, Stantec included the analyses of method blanks, spiked blanks, and duplicates (10%) for each sample batch. A summary of Paterson's QA/QC protocol, including sampling containers, preservation, labelling, handling, and custody, equipment cleaning procedures, and field quality control measurements is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

Site soils consist of fill material consisting of silty sand or clayey sand with gravel underlain by shale and limestone interbedded.

Bedrock was encountered at depths ranging from approximately 0.97 to1.07m below grade. Bedrock was cored to a maximum depth of 4.42 m below grade.

Groundwater was encountered within bedrock at depths ranging from approximately 3.16-3.70 mbgs.

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

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured by Stantec in 2017. Groundwater levels are summarized below in Table 5.

TABLE 5: Groundwater Level Measurements				
Borehole Location	**Ground Surface Elevation (m)**	**Water Level Depth (m below grade)**	**Water Level Elevation (m ASL)**	**Date of Measurement**
MW17-1	67.62	3.48	64.14	February 17, 2017
MW17-2	67.35	3.70	63.65	February 17, 2017
MW17-3	67.37	3.16	64.21	February 17, 2017
MW17-1	67.62	3.24	64.38	September 13, 2019
MW17-3	67.37	3.01	64.36	September 13, 2019
MW17-1	67.62	3.25	64.37	March 23, 2022
MW17-2	67.35	1.86	65.49	March 23, 2022
MW17-3	67.37	4.38	62.99	March 23, 2022

Based on the groundwater elevations measured during the most recent sampling event, groundwater contour mapping was completed. Groundwater contours are shown on Drawing PE4744-3. Based on the contour mapping, groundwater flow at the Phase II Property is in a westerly direction. A horizontal hydraulic gradient of approximately 0.1 m/m was calculated.

5.3 Fine-Coarse Soil Texture

Grain-size analysis was not completed for the Phase II Property. As such, coarse-grained soil standards were used.

5.4 Soil: Field Screening

Stantec conducted a field screening of the soil samples collected during drilling resulted in vapour readings were less than 5 ppm. The field screening results of each individual soil sample are provided on the Soil Profile and Test Data Sheets appended to this report.

5.5 Soil Quality

Soil samples from the 2017 subsurface investigation were submitted for analytical testing. The results of the analytical testing from 2017 are presented in the Tables at the end of the report. The laboratory certificates of analysis are provided in Appendix 1. A discussion of the soil quality of the Phase II property, based on the 2017 is as follows:

BTEX

Three soil samples from the 2017 subsurface investigation were submitted for analysis of BTEX. The total xylene concentration identified in Sample MW17-

1GS1 exceeded the MECP Table 1 Residential Standards, while the remaining concentrations complied to the Table 1 Residential Standards.

All of the parameter concentrations complied with the MECP Table 7 Residential Standards. The analytical soil results are presented in the Appendix, Table 1A.

PHCs

Three soil samples from the 2017 subsurface investigation were submitted for PHCs (F1-F4) analysis. PHC (F_4) concentrations were identified in all three soil samples, in excess of the selected MECP Table 1 Residential Standards.

All of the parameter concentrations complied with the MECP Table 7 Residential Standards. The analytical soil results are presented in the Appendix, Table 1A.

Metals (including CrVI and Hg)

Three (3) soil samples from the 2017 subsurface investigation were submitted for analysis of metals, including hexavalent chromium and mercury. Metal concentrations were identified in all of the soil samples analyzed. The concentration of Lead in Sample MW17-3GS1 exceeded the MECP Table 1 and Table 7 Standards. The remaining soil samples comply with the MECP Table 1 and Table 7 Residential Standards. The analytical soil results are presented in the Appendix, Table 2A.

PAHs

Three (3) soil samples including a duplicate sample from the 2017 subsurface investigations were submitted for analysis of PAHs. Several PAH parameter concentrations (acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo(k)fluoranthene, fluoranthene, fluorene, indeno[p1,2,3-cd]pyrene, naphthalene, phenanthrene, and pyrene) were in excess of the MECP Table 1 and/or Table 7 Residential Standards. The analytical soil results are presented in the Appendix, Table 3A.

VOCs

Three soil samples from the 2017 subsurface investigation were submitted for analysis of VOCs. Hexane and/or total xylene concentrations were identified in all three Samples in excess of the MECP Table 1 Residential Standards, while the remaining concentrations complied to the Table 1 Standards.

All of the parameter concentrations complied with the MECP Table 7 Residential Standards. The analytical soil results are presented in the Appendix, Table 4A.

The maximum concentrations of the analyzed parameters in the soil at the Phase II property are summarized below in Table 6.

The analytical results for BTEX, PHCs, VOCs and Metals tested in soil are shown on Drawings PE4744-4 through PE4744-8, in the Figures section of this report.

Table 6. Maximum Concentration - Soils

Parameter	Maximum Concentration (ug/g dry)	Borehole	Depth Interval (mbgs)
Toluene	0.047	MW17-1GS1	0.0-0.6, Fill
Xylenes (Total)	**(0.15)**		
F3 PHCs (C16-C34)	130	MW17-3-GS1	
F4 PHCs (C34-C50)	**(200)**	MW17-1GS1	
F4 PHCs (C34-C50) Gravimetric	**(1200)**		
Mercury	0.091	MW17-1GS1	
Antimony	1.6	MW17-2GS1	
Arsenic	4.45		
Barium	160	MW17-3-GS1	
Beryllium	0.42	MW17-2GS1	
Boron	12		
Boron (Available)	0.52	MW17-1GS1	
Cadmium	0.23		
Chromium	19	MW17-2GS1	
Cobalt	6.1		
Copper	36		
Lead	**(140)**	MW17-3-GS1	
Molybdenum	0.85	MW17-2GS1	
Nickel	15	MW17-3-GS1	
Thallium	0.28		
Uranium	0.49	MW17-2GS1	
Vanadium	19		
Zinc	100		

Table 6 Continued. Maximum Concentration - Soils			
Parameter	**Maximum Concentration (ug/g dry)**	**Borehole**	**Depth Interval (mbgs)**
Acenaphthene	**(0.44)**	MW17-3-GS1	0.0-0.6, Fill
Acenaphthylene	**(0.18)**		
Anthracene	**(1.4)**		
Benzo[a]anthracene	**(2.9)**		
Benzo[a]pyrene	**(2.5)**		
Benzo[b]fluoranthene	**(3.3)**		
Benzo[g,h,i]perylene	**(1.5)**		
Benzo[k]fluoranthene	1.2		
Chrysene	2.4		
Dibenzo[a,h]anthracene	**(0.4)**		
Fluoranthene	**(6.8)**		
Fluorene	**(0.67)**		
Indeno [1,2,3-cd] pyrene	**(1.7)**		
1-Methylnaphthalene	0.13		
2-Methylnaphthalene	0.19		
Methylnaphthalene (1&2)	0.31		
Naphthalene	**(0.21)**		
Phenanthrene	**(5.2)**		
Pyrene	**(5.2)**		
Hexane	**(0.14)**	MW17-1GS1	
Xylenes, total	**(0.15)**		

No other parameters were identified above the laboratory method detection limits.

5.6 Groundwater Quality

Ground samples from monitoring wells installed in MW17-1, MW17-2 and MW17-3 were submitted for laboratory analysis of PHC (fractions, F1-F4), PAHs, Metals and VOCs analyses, which include the BTEX group. The results of the analytical testing from 2017, 2018 and 2019 are presented in the Tables at the end of the report. The laboratory certificates of analysis are provided in Appendix 1. A discussion of the groundwater quality of the Phase II property is as follows:

BTEX

Six (6) groundwater samples including a duplicate sample from the February 17 and 28, 2017 groundwater sampling events were submitted for BTEX analysis. The analytical results of the first sampling event identified benzene and toluene at MW17-3 in excess of the MECP Table 1 Residential Standards. The groundwater results from the second sampling event did not identify any BTEX concentrations and as such, all BTEX concentrations complied with the MECP Table 1 and 7 Residential Standards.

Paterson submitted a groundwater sample for BTEX analyses on April 4, 2018 and March 23, 2022. The final BTEX concentrations were below the detection limit and therefore, complied with the MECP Table 1 and 7 Standards. The analytical groundwater results are presented in the Appendix, Table 1B.

PHCs

Six (6) groundwater samples including a duplicate sample from the February 17 and 28, 2017 groundwater sampling events were submitted for BTEX analysis. The analytical results of the first sampling event identified PHC, F3 at MW17-2 in excess of the MECP Table 1 and 7 Standards. The groundwater results from the second sampling event did not identify any PHC concentrations, and as such, all PHC concentrations complied with the MECP Table 1 and 7 Residential Standards.

Paterson submitted a groundwater sample for PHC analyses on April 4, 2018, September 13, 2019 and March 23, 2022. The final PHC concentrations below the detection limit and therefore, complied with the MECP Table 1 and 7 Standards. The analytical groundwater results are presented in the Appendix, Table 1B.

Metals (including CrVI and Hg)

Three (3) groundwater samples from the February 28, 2017 groundwater sampling event was submitted for metals, including hexavalent chromium and mercury analyses. With the exception of sodium identified in groundwater Sample MW17-2, all of the remaining metal parameter concentrations complied with the MECP Table 1 and Table 7 Standards.

Paterson submitted a groundwater sample for sodium analysis on September 13, 2019. The final sodium concentration complied with the MECP Table 1 and 7

Standards. The analytical groundwater results are presented in the Appendix, Table 2B.

PAHs

Three (3) groundwater samples including a duplicate sample from the February 28, 2017 groundwater sampling event was submitted for PAH analyses. With the exception of benzo(a)pyrene identified in groundwater Sample MW17-1, all of the remaining PAH parameter concentrations complied with the MECP Table 1 and Table 7 Standards.

Paterson submitted a groundwater sample for PAH analysis on September 13 and 24, 2019. Both groundwater samples contained PAH concentrations in excess of the MECP Table 1 and 7 Standards. A more recent groundwater sample collected on March 23, 2022, was submitted for PAH analysis. The laboratory results of the final PAH concentrations complied with the MECP Table 1 and 7 Standards. The analytical groundwater results are presented in the Appendix, Table 3B.

VOCs

Three (3) groundwater samples from the February 17, 2017 groundwater sampling event was submitted for VOC analyses. Chloroform concentrations in Samples MW17-1 and MW17-3 were in excess the MECP Table 1 and 7 Standards. The chloroform concentrations were not considered contaminants a that time, as these concentrations were a result of the municipal water used for coring bedrock. The concentrations of benzene and toluene in MW17-3 were in excess of the MECP Table 1 Standards. Benzene was also in excess of the Table 7 Standard.

Paterson submitted a groundwater sample from MW17-1 and MW17-3 on April 18, 2018, and September 13, 2019, respectively, for VOC analysis. The laboratory results of the final VOC concentrations were below the detection limit and as such, complied with the MECP Table 1 and 7 Standards. The analytical groundwater results are presented in the Appendix, Table 4B.

The analytical results for BTEX, PHCs PAHs, Metals and VOCs tested in the groundwater are shown on Drawings PE4744-9 and PE4744-10. All of the final groundwater results are in compliance with the MECP Table 1 and 7 Standards.

The final maximum concentrations of analyzed parameters in the groundwater at the site are summarized below in Table 7.

Table 7. Maximum Concentration - Groundwater

Parameter	Maximum Concentration (ug/L)	Borehole	Screened Interval (mbgs)
Antimony	0.61	MW17-1	1.42 - 4.2
Barium	110		
Boron	240		
Cadmium	0.1		
Cobalt	0.92		
Copper	1.9	MW17-2	
Molybdenum	3.5	MW17-1	
Nickel	9.2		
Selenium	2.2	MW17-2	
Sodium	416000	MW17-2	
Thallium	0.13	MW17-1	
Uranium	1.8		
Xylenes	2.4		
Fluoranthene	0.02		
1-Methylnaphthalene	0.42		
2-Methylnaphthalene	0.13		
Methylnaphthalene (1&2)	0.54		
Pyrene	0.03		

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

5.7 Quality Assurance and Quality Control Results

All samples submitted as part of the February 2017 sampling events were handled in accordance with the Analytical Protocol with respect to preservation method, storage requirement, and container type.

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

Stantec submitted a duplicate soil sample and groundwater sample for PAHs in soil and BTEX and PHCs in groundwater. Test results for the duplicate soil and RPD calculations are provided in Table 8.

The test concentrations for the groundwater and duplicate samples were below the detection limit.

Table 8. QA/QC Results - Duplicate Soil Sample MW17-1GS1

Parameter	MW17-1GS1	DUP (MW17-1GS)	RPD (%)	QA/QC Results
Acenaphthylene	0.066	0.076	14	Within the acceptable range
Anthracene	0.12	0.14	15	Within the acceptable range
Benzo[a]anthracene	0.36	0.41	13	Within the acceptable range
Benzo[a]pyrene	0.42	0.48	13	Within the acceptable range
Benzo[b]fluoranthene	0.57	0.63	10	Within the acceptable range
Benzo[g,h,i]perylene	0.33	0.37	11	Within the acceptable range
Benzo[k]fluoranthene	0.19	0.23	19	Within the acceptable range
Chrysene	0.34	0.38	11	Within the acceptable range
Dibenzo[a,h]anthracene	0.073	0.079	8	Within the acceptable range
Fluoranthene	0.67	0.78	15	Within the acceptable range
Indeno [1,2,3-cd] pyrene	0.35	0.39	11	Within the acceptable range
Phenanthrene	0.42	0.46	9	Within the acceptable range
Pyrene	0.56	0.65	15	Within the acceptable range

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

5.8 Phase II Conceptual Site Model

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

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

Based on the results of the Phase I ESA completed for the Phase II Property, on- and off-site PCAs and the resultant APECs are summarized in Table 9, along with their respective locations and contaminants of potential concern (CPCs).

Table 9. Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 1: Former Car Dealership	South-western portion of the Phase I Property	PCA 52 – *"Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems,"*	On-site	BTEX PHCs (F_1-F_4)	Soil and Groundwater
APEC 2: Fill Material of Unknown Quality	Throughout the parking area of the Phase I property	PCA 30 – "*Importation of Fill Material of Unknown Quality,"*	On-site	PAHs Metals Hg, CrVI	Soil
APEC 3: Pad Mounted Transformer	Northwest corner of the parking area.	PCA 55 – *"Transformer Manufacturing, Processing and Use"*	On-site	BTEX PCBs PHCs (F_1-F_4)	Soil
APEC 4: Former Retail fuel outlet and automotive service garage	Southwestern portion of the Phase I Property	PCA 28 – "*Gasoline and associated products stored in fixed tanks,"* PCA 52 – *"Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems,"*	Off-site	BTEX PHCs (F_1-F_4)	Groundwater

Table 9. Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 5: Former Dry Cleaners	Southeastern portion of the Phase I Property	PCA 37 - *"Operation of Dry Cleaning Equipment (where chemicals are used),"*	Off-site	VOCs	Groundwater
APEC 6[1]: Application of Road Salt	Within the parking areas of the Phase I property	Other: Application of road salt for the safety of vehicular or pedestrian traffic under conditions of snow or ice	On-site	EC SAR	Soil

1 – In accordance with Section 49.1 of O.Reg. 153/04 standards are deemed to be met if an applicable site condition standard is exceeded at a property solely because the qualified person has determined that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. The exemption outlined in Section 49.1 is being relied upon with respect to the Phase II ESA property.

Contaminants of Potential Concern

The contaminants of potential concern (CPCs) in soil include are:

- ❑ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Petroleum hydrocarbons (PHCs, Fractions F_1-F_4);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);
- ❒ Volatile organic compounds (VOCs); and
- ❒ Metals plus Mercury (Hg), and Hexavalent Chromium (CrVI).

The contaminants of potential concern (CPCs) in groundwater include are:

- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- Petroleum hydrocarbons (PHCs, Fractions F_1-F_4);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Volatile organic compounds (VOCs); and
- Metals plus Mercury (Hg), and Hexavalent Chromium (CrVI)

Subsurface Structures and Utilities

The Phase II Property is situated in a municipally serviced area. Underground utility services on the Phase II Property include natural gas, water and sewer services, which enters the Phase II Property from Richmond Road and Roosevelt Avenue. With the exceptions of the basement levels of both of the buildings, groundwater monitoring wells and underground utilities, there are no other subsurface structures on the Phase II Property.

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is illustrated on Drawings PE4744-4A, 4B, 5A and 5B. The stratigraphy consists of:

- An asphaltic concrete structure of approximately 0.10 m thick, overlies the fill material consisting of clayey sand to sandy clay with some gravel, extending to a depth of 0.3 mbgs. Fill material was encountered in all of the boreholes. Groundwater was not encountered in this layer.

- Silty clay was encountered in all of the boreholes, extending to depths of approximately 0.97 to 1.07 mbgs. Groundwater was not encountered in this layer.

- Limestone interbedded with shale was encountered in all of the boreholes and terminated in this layer at 4.42mbgs. Groundwater was encountered in this layer in al of the boreholes.

Hydrogeological Characteristics

Groundwater at the Phase II Property was encountered in the bedrock. During the most recent groundwater monitoring event, groundwater flow was measured

in a westerly direction, with a hydraulic gradient of 0.1 m/m. Groundwater contours are shown on Drawing PE4744-3 – Test Hole Location Plan.

Approximate Depth to Bedrock

Bedrock was encountered during the drilling program at depths ranging from approximately 0.97 to 1.07 mbgs.

Approximate Depth to Water Table

The depth to the water table at the Phase II Property varies between approximately 3.16 to 3.70 m below existing grade.

Sections 41 and 43.1 of the Regulation

Section 41 of O.Reg. 153/04 does apply to the Phase II ESA Property, as the property is considered an environmentally sensitive area, as the pH value at the surface is 10.5.

Section 43.1 of O.Reg. 153/04 does apply to the Phase II Property in that the property is a Shallow Soil property.

Fill Placement

The fill material consisted of clayey sand to sandy clay with some gravel, which extended to a depth 0.3 mbgs.

Areas of Natural Significance

No areas of natural significance were identified in the Phase I Study Area.

Water Bodies

No water bodies were identified on the Phase II Property or on properties within the Phase I Study Area.

Proposed Buildings and Other Structures

It is our understanding that the Phase II Property will be redeveloped with a 9-storey mixed use (commercial and residential) with underground parking. The proposed building footprint will cover the majority of the property.

Existing Buildings and Structures

The southern portion of the Phase I Property is occupied by a chapel and funeral parlour. The eastern wing/original funeral parlour was constructed in 1901, with additions built in 1958 (chapel) and circa 1967 (front entrance). The funeral parlour consists of three (3) levels – a basement, main floor and a partial second level. The exterior is finished in stucco and a flat style roof, with a stone and mortar foundation.

The northern portion of the Phase I Property is occupied by 2-storey residential dwelling that was construction prior to 1928 and a private garage that was constructed circa 2000. The exterior of the dwelling is finished in red brick with a sloped shingle style roof and a stone and mortar foundation.

Environmental Condition

Areas Where Contaminants are Present

Based on visual screening and analytical test results from 2017, impacted fill material is present in all three borehole locations. Concentrations of xylenes, hexane, PHC (F4) and several PAHs at MW17-1 were in excess of the MECP Table 1 and/or Table 7 Residential Standards. Concentrations of hexane, PHC (F4), lead and several PAHs at MW17-2 were in excess of the MECP Table 1 and/or Table 7 Residential Standards. Concentrations of hexane, PHC (F4) and several PAHs at MW17-2 were in excess of the MECP Table 1 and/or Table 7 Residential Standards. Analytical test results for soil are shown on Drawings PE4744-5, 6, 7 and 8 – Analytical Testing Plans (Soil).

Based on the most recent groundwater sampling events completed in 2018, 2019 and 2022, the groundwater concentrations for all of the analyzed parameters were in compliance with the MECP Table 1 and Table 7 Standards. Analytical test results for groundwater are shown on Drawings PE4744-9 and 10 – Analytical Testing Plans (Groundwater).

Types of Contaminants

Based on the PCAs resulting in APECs on the Phase II Property and the final test results, the contaminants of concern in the soil include the following: hexane, xylenes, PHC fraction F_4, metals (lead), and several PAH parameters (acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene).

As noted previously, the groundwater at the Phase II Property is in compliance with the selected MECP Table 1 and 7 Standards; however, supplemental groundwater sampling will be required to confirm the final groundwater conditions beneath the Phase II Property.

Contaminated Media

Based on the results of the Phase II ESA, the overburden material at all three borehole locations is contaminated with PHCs (F_4), VOCs (hexane and/or xylenes), metals (lead) and PAHs.

All final groundwater results from 2018, 2019 and 2022 complied with the MECP Table 1 and 7 Standards. Although, additional groundwater sampling will be required to confirm the final groundwater conditions beneath the Phase II Property.

What Is Known About Areas Where Contaminants Are Present

The overburden on the southwestern portion of the Phase II Property (MW17-1) is impacted with hexane, xylenes, PHC (F_4) and several PAH parameters. The western side is impacted with lead, hexane, PHC (F_4) and several PAH parameters. The northeastern portion is impacted with hexane, PHC (F_4) and several PAH parameters. Analytical test results for soil are shown on Drawings PE4744-5, 6, 7 and 8 – Analytical Testing Plans (Soil).

Distribution and Migration of Contaminants

Based on the findings of the Phase II ESA, the CPCs identified in the overburden have migrated vertically as these CPCs were identifed in the groundwater. While the latest groundwater results all comply with the applicable standards, additional groundwater sampling will be required to confirm the final groundwater conditions beneath the Phase II Property.

Discharge of Contaminants

Hexane, xylenes, PHCs and PAHs concentrations at MW17-1 are considered to have been associated with the former use of the Phase II Property as well as the neighbouring properties that had formerly operated as a retail fuel outlet and garage. PAHs and lead impact identified on the northern portion of 403 Richmond Road is considered to be a result of importation of fill material.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the Phase II Property addressed 403 Richmond Road and 389 Roosevelt Avenue, in the Ottawa, Ontario. The purpose of the Phase II ESA was to address the Areas of Potential Environmental Concern identified on the Phase II Property.

TA drilling program was conducted by Stantec in 2017, which consisted of placing three (3) boreholes on the Phase II Property (403 Richmond Road). All three boreholes were instrumented with groundwater monitoring wells. The general soil profile encountered during the field program consisted of a pavement structure overlying fill material consisting of clayey sand to sandy clay with gravel, followed by a silty sand layer, underlain by interbedded shale and limestone bedrock. The bedrock was encountered during the drilling program at depths ranging from approximately 0.97 to 1.07mbgs.

Three (3) soil samples, including a duplicate sample, were submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, Fractions F_1-F_4), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and/or metals (including hexavalent chromium and mercury). Analytical results identified hexane, xylenes, PHCs (F_4), lead and several PAH parameter concentrations in excess of the selected MECP Table 1 and/or Table 7 Residential Standards.

Groundwater samples from monitoring wells MW17-1, MW17-2 and MW17-3 were collected by Stantec during the interim of February 16 to 28 of 2017, and analyzed for VOCs, BTEX, PHCs, Metals (including Hg and CrVI), and PAHs. The analytical results identified BTEX, PHCs, PAHs and VOCs in the groundwater samples in excess of the MECP Table 1 and/or Table 2 Standards. Supplemental groundwater testing was conducted by Paterson in April of 2018, September of 2019 and in March of 2022 to re-assess the groundwater conditions. No free product or petroleum hydrocarbon sheen was noted on the purge water during the groundwater sampling events in 2018, 2019 or 2022. Based on the latest analytical results, all of the analyzed groundwater results were in compliance with the MECP Table 1 and Table 7 Standards.

Recommendations

Soil

Based on the findings of the Phase II ESA, the overburden material on the Phase II ESA property is impacted with BTEX (xylenes), PHCs (F_4), VOCs (hexane), metals (lead) and PAHs exceeding the MECP Table 1 and/or Table 7 Residential Standards.

Prior to redevelopment of the Phase II Property a soil remediation program will be required. At this time, all soil leaving the Phase II property will need to be disposed of at a licensed waste facility.

A TCLP sample will be required prior to landfill disposal. More information can be provided in this regard prior to remediation.

Monitoring Wells

If the monitoring wells installed on the Phase II Property are not going to be used in the future, or will be destroyed during site redevelopment, they should be abandoned according to Ontario Regulation 903.

7.0 STATEMENT OF LIMITATIONS

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

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

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

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

Paterson Group Inc.

Mandy Witteman, B.Eng., M.A.Sc.

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

Report Distribution:

- Starwood Properties Inc.
- Paterson Group

FIGURES

Figure 1 - Key Plan

Drawing PE4744-1R – Site Plan

Drawing PE4744-2R – Surrounding Land Use Plan

Drawing PE4744-3 – Test Hole Location Plan

Drawing PE4744-4– Analytical Testing Plan – Soil (Metals)

Drawing PE4744-4A – Cross-section A – A' – Soil (Metals)

Drawing PE4744-4B – Cross-section B – B' – Soil (Metals)

Drawing PE4744-5 – Analytical Testing Plan – Soil (PAHs)

Drawing PE4744-5A – Cross-section A – A' – Soil (PAHs)

Drawing PE4744-5B – Cross-section B – B' – Soil (PAHs)

Drawing PE4744-6 – Analytical Testing Plan – Soil (PAHs)

Drawing PE4744-6A – Cross-section A – A' – Soil (PAHs)

Drawing PE4744-6B – Cross-section B – B' – Soil (PAHs)

FIGURES

Drawing PE4744-7 – Analytical Testing Plan – Soil (VOCs)

Drawing PE4744-7A – Cross-section A – A’ – Soil (VOCs)

Drawing PE4744-7B – Cross-section B – B’ – Soil (VOCs)

Drawing PE4744-8 – Analytical Testing Plan – Soil (BTEX, PHCs)

Drawing PE4744-8A – Cross-section A – A’ – Soil (BTEX, PHCs)

Drawing PE4744-8B – Cross-section B – B’ – Soil (BTEX, PHCs)

Drawing PE4744-9 – Analytical Testing Plan – Groundwater (PHCs, VOCs)

Drawing PE4744-9A – Cross-section A – A’ – Groundwater (PHCs, VOCs)

Drawing PE4744-9B – Cross-section B – B’ – Groundwater (PHCs, VOCs)

Drawing PE4744-10 – Analytical Testing Plan – Groundwater (PAHs, Metals)

Drawing PE4744-10A – Cross-section A – A’ – Groundwater (PAHs, Metals)

Drawing PE4744-10B – Cross-section B – B’ – Groundwater (PAHs, Metals)

#388 WINSTON AVE. RESIDENTIAL

#390 WINSTON AVE. RESIDENTIAL

#392 WINSTON AVE. RESIDENTIAL

#394 WINSTON AVE. RESIDENTIAL

#396 WINSTON AVE. RESIDENTIAL

#395 RICHMOND ROAD COMMERCIAL

#399 DANFORTH AVENUE COMMERCIAL

#385 ROOSEVELT AVENUE RESIDENTIAL

#387 ROOSEVELT AVENUE RESIDENTIAL

#389 RICHMOND ROAD RESIDENTIAL

SHED

PAD-MOUNTED TRANSFORMER

A

MW17-2
67.35
(65.49)

ASPHALTIC CONCRETE

64.8

64.6

64.4

64.2

64

63.8

63.6

(0.1m/m)

FORMER BUILDING FOOTPRINT

FORMER BUILDING FOOTPRINT

#403 RICHMOND ROAD TUBMAN FUNERAL HOMES

FORMER BUILDING FOOTPRINTS

CANOPY

B

MW17-3
67.37
(62.99)

B'

MW17-1
67.62
(64.37)

ASPHALTIC CONCRETE

A'

R I C H M O N D R O A D

#411 ROOSEVELT AVENUE COMMERCIAL / OFFICE BUILDING

R O O S E V E L T A V E N U E

RESIDENTIAL

#386 ROOSEVELT AVENUE RESIDENTIAL

#390 ROOSEVELT AVENUE RESIDENTIAL

#394-396 ROOSEVELT AVENUE RESIDENTIAL

#398 ROOSEVELT AVENUE RESIDENTIAL

#402 ROOSEVELT AVENUE RESIDENTIAL

#415 RICHMOND ROAD COMMERCIAL

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
- 67.62 GROUND SURFACE ELEVATION (m)
- (64.37) GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A — A' CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

patersongroup
consulting engineers

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
403 RICHMOND ROAD & 389 ROOSEVELT AVENUE

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:300	**Date:** 04/2022
Drawn by: YA	**Report No.:** PE4744-1R
Checked by: MW	**Dwg. No.:** PE4744-3
Approved by: MB	**Revision No.:**

11x17

p:\autocad drawings\environmental\pe47xx\pe4744\pe4744-phase ii (march 2022).dwg

#388 WINSTON AVE. RESIDENTIAL

#390 WINSTON AVE. RESIDENTIAL

#392 WINSTON AVE. RESIDENTIAL

#394 WINSTON AVE. RESIDENTIAL

#396 WINSTON AVE. RESIDENTIAL

#395 RICHMOND ROAD COMMERCIAL

#399 DANFORTH AVENUE COMMERCIAL

#385 ROOSEVELT AVENUE RESIDENTIAL

#387 ROOSEVELT AVENUE RESIDENTIAL

MW17-2GS1 0.0-0.6m 09-Feb-17
Metals comply with the MECP Table 1 Standards

A

MW17-2
67.35
(65.49)

ASPHALTIC CONCRETE

FORMER BUILDING FOOTPRINT

FORMER BUILDING FOOTPRINT

#403 RICHMOND ROAD
TUBMAN FUNERAL HOMES

FORMER BUILDING FOOTPRINTS

#389 RICHMOND ROAD
RESIDENTIAL

SHED

PAD-MOUNTED TRANSFORMER

B

MW17-3
67.37
(62.99)

A'

CANOPY

B'

ASPHALTIC CONCRETE

MW17-1
67.62
(64.37)

MW17-1GS1 0.0-0.6m 09-Feb-17
Metals comply with the MECP Table 1 Standards

MW17-3GS1 0.0-0.6m 09-Feb-17

Parameter	Results (µg/g)	Standard(µg/g)
Lead	140	120

Metals comply with the MECP Table 1 Standards

R O O S E V E L T A V E N U E

R I C H M O N D R O A D

#411 ROOSEVELT AVENUE COMMERCIAL / OFFICE BUILDING

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
- 67.62 GROUND SURFACE ELEVATION (m)
- (64.37) GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A — A' CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

RESIDENTIAL

#386 ROOSEVELT AVENUE RESIDENTIAL

#390 ROOSEVELT AVENUE RESIDENTIAL

#394-396 ROOSEVELT AVENUE RESIDENTIAL

#398 ROOSEVELT AVENUE RESIDENTIAL

#402 ROOSEVELT AVENUE RESIDENTIAL

#415 RICHMOND ROAD COMMERCIAL

SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL (METALS)

Scale: 1:300	**Date:** 04/2022
Drawn by: YA	**Report No.:** PE4744-1
Checked by: MW	**Dwg. No.:** PE4744-4
Approved by: MB	**Revision No.:**

11x17

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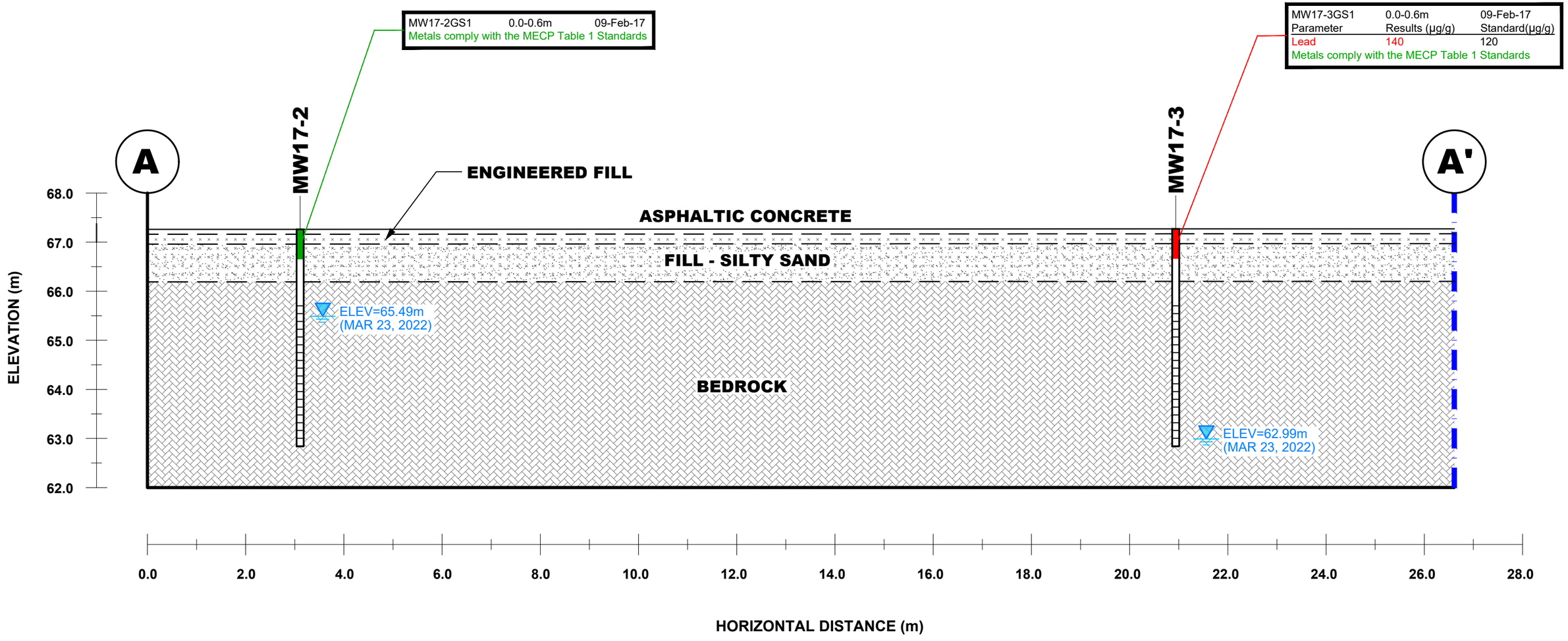

SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (METALS)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-4A
Approved by: MB	Revision No.:

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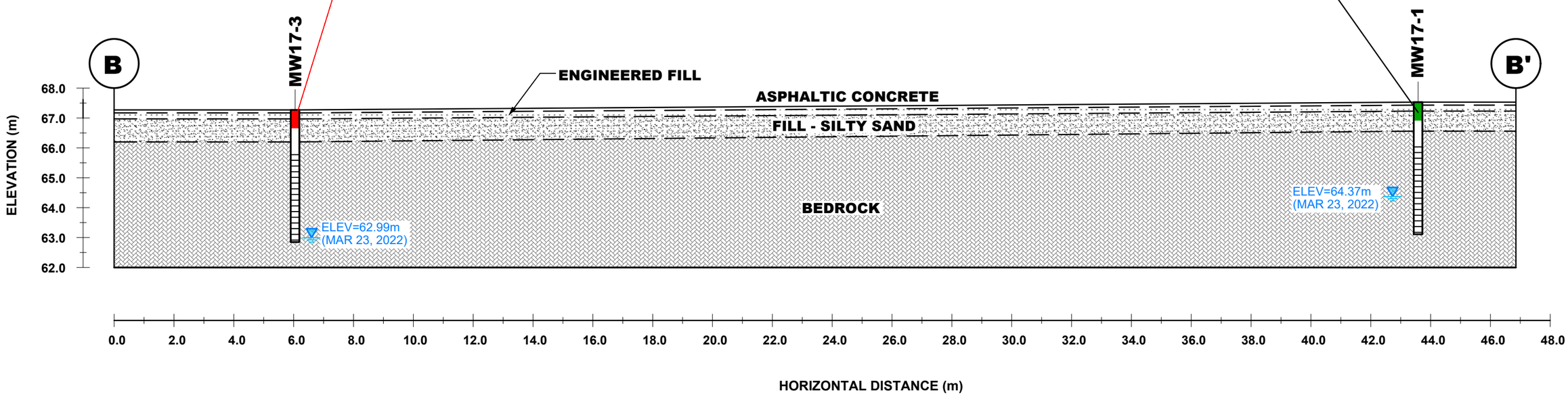
11x17

MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Lead	140	120
Metals comply with the MECP Table 1 Standards		

MW17-1GS1	0.0-0.6m	09-Feb-17
Metals comply with the MECP Table 1 Standards		



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

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consulting engineers

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (METALS)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-4B
Approved by: MB	Revision No.:

11x17

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#388 WINSTON AVE. RESIDENTIAL

#390 WINSTON AVE. RESIDENTIAL

#392 WINSTON AVE. RESIDENTIAL

#394 WINSTON AVE. RESIDENTIAL

#396 WINSTON AVE. RESIDENTIAL

ND ROAD
RCIAL

#399 DANFORTH AVENUE
COMMERCIAL

#411 ROOSEVELT AVENUE
COMMERCIAL / OFFICE BUILDING

R I C H M O N D R O A D

MW17-2GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Acenaphthene	0.12	0.072
Anthracene	0.35	0.16
Benzo(a)anthracene	1.1	0.36
Benzo(a)pyrene	1.1	0.3
Benzo(b)fluoranthene	1.5	0.47
Benzo(g,h,i)perylene	0.73	0.68
Dibenzo(a,h)anthracene	0.19	0.1
Fluoranthene	2.3	0.56
Fluorene	0.12	0.12
Indeno(1,2,3-cd)pyrene	0.95	0.23
Phenanthrene	1.4	0.69
Pyrene	1.9	1.0
Remaining PAHs comply with the MECP Table 1 Standards		

#385 ROOSEVELT AVENUE RESIDENTIAL

#387 ROOSEVELT AVENUE RESIDENTIAL

#389 RICHMOND ROAD RESIDENTIAL

SHED

A

MW17-2
67.35
(65.49)

ASPHALTIC CONCRETE

FORMER BUILDING FOOTPRINT

FORMER BUILDING FOOTPRINT

#403 RICHMOND ROAD
TUBMAN FUNERAL HOMES

FORMER BUILDING FOOTPRINTS

PAD-MOUNTED TRANSFORMER

B

MW17-3
67.37
(62.99)

CANOPY

ASPHALTIC CONCRETE

B'

MW17-1
67.62
(64.37)

A'

MW17-3GS1	0.0-0.60	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Acenaphthene	0.44	0.072
Acenaphthylene	0.18	0.093
Anthracene	1.4	0.16
Benzo(a)anthracene	2.9	0.36
Benzo(a)pyrene	2.5	0.3
Benzo(b)fluoranthene	3.3	0.47
Benzo(g,h,i)perylene	1.5	0.68
Dibenzo(a,h)anthracene	0.4	0.1
Fluoranthene	6.8	0.56
Fluorene	0.67	0.12
Indeno(1,2,3-cd)pyrene	1.7	0.23
Nephthalene	0.21	0.09
Phenanthrene	5.2	0.69
Pyrene	5.2	1.0
Remaining PAHs comply with the MECP Table 1 Standards		

R O O S E V E L T A V E N U E

MW17-1GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Benzo(a)anthracene	0.36	0.36
Benzo(a)pyrene	0.42	0.3
Benzo(b)fluoranthene	0.57	0.47
Fluoranthene	0.67	0.56
Indeno(1,2,3-cd)pyrene	0.35	0.23
Remaining PAHs comply with the MECP Table 1 Standards		

DUP	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Benzo(a)anthracene	0.41	0.36
Benzo(a)pyrene	0.48	0.3
Benzo(b)fluoranthene	0.63	0.47
Fluoranthene	0.78	0.56
Indeno(1,2,3-cd)pyrene	0.95	0.23
Remaining PAHs comply with the MECP Table 1 Standards		

RESIDENTIAL

#386 ROOSEVELT AVENUE RESIDENTIAL

#390 ROOSEVELT AVENUE RESIDENTIAL

#394-396 RO
RES

VENUE

#402 ROOSEVELT AVENUE RESIDENTIAL

#415 RICHMOND ROAD COMMERCIAL

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
- 67.62 GROUND SURFACE ELEVATION (m)
- (64.37) GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A — A' CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

patersongroup
consulting engineers

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Ottawa, Ontario K2E 7J5
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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL (PAHs)

Scale: 1:300	**Date:** 04/2022
Drawn by: YA	**Report No.:** PE4744-1
Checked by: MW	**Dwg. No.:** PE4744-5
Approved by: MB	**Revision No.:**

11x17

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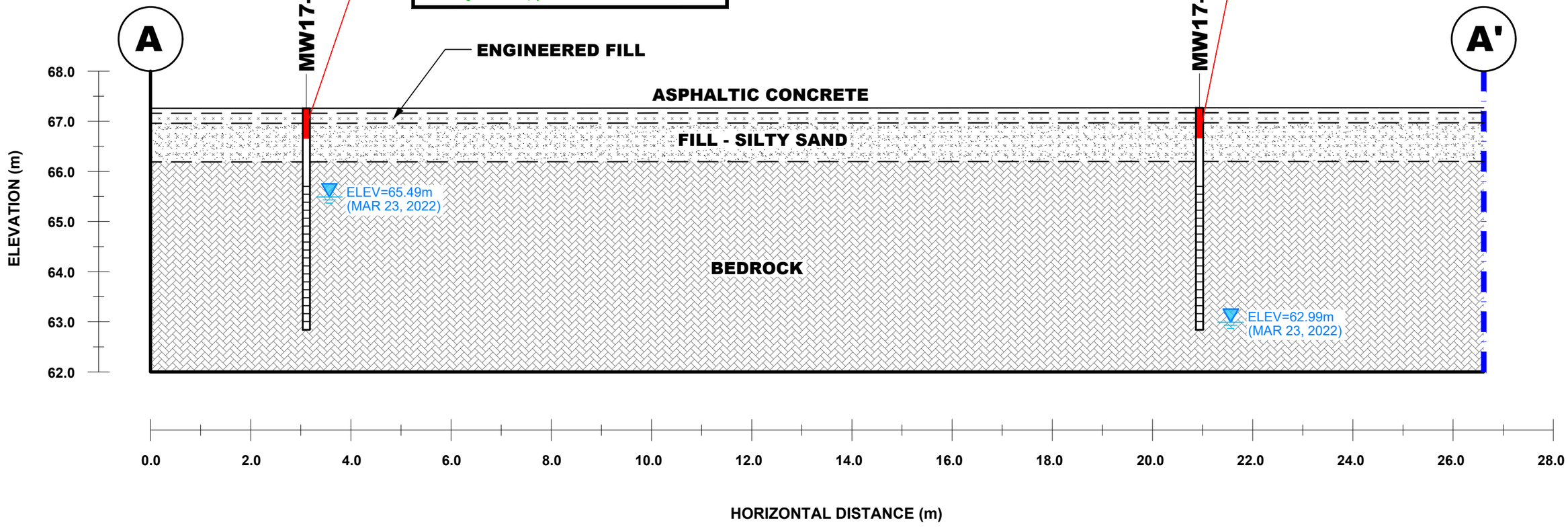
MW17-2GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Acenaphthene	0.12	0.072
Anthracene	0.35	0.16
Benzo(a)anthracene	1.1	0.36
Benzo(a)pyrene	1.1	0.3
Benzo(b)fluoranthene	1.5	0.47
Benzo(g,h,i)perylene	0.73	0.68
Dibenzo(a,h)anthracene	0.19	0.1
Fluoranthene	2.3	0.56
Fluorene	0.12	0.12
Indeno(1,2,3-cd)pyrene	0.95	0.23
Phenanthrene	1.4	0.69
Pyrene	1.9	1.0

Remaining PAHs comply with the MECP Table 1 Standards

MW17-3GS1	0.0-0.60	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Acenaphthene	0.44	0.072
Acenaphthylene	0.18	0.093
Anthracene	1.4	0.16
Benzo(a)anthracene	2.9	0.36
Benzo(a)pyrene	2.5	0.3
Benzo(b)fluoranthene	3.3	0.47
Benzo(g,h,i)perylene	1.5	0.68
Dibenzo(a,h)anthracene	0.4	0.1
Fluoranthene	6.8	0.56
Fluorene	0.67	0.12
Indeno(1,2,3-cd)pyrene	1.7	0.23
Nephthalene	0.21	0.09
Phenanthrene	5.2	0.69
Pyrene	5.2	1.0

Remaining PAHs comply with the MECP Table 1 Standards



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

patersongroup
consulting engineers

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Ottawa, Ontario K2E 7J5
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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (PAHs)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-5A
Approved by: MB	Revision No.:

11x17

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MW17-3GS1	0.0-0.60	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Acenaphthene	0.44	0.072
Acenaphthylene	0.18	0.093
Anthracene	1.4	0.16
Benzo(a)anthracene	2.9	0.36
Benzo(a)pyrene	2.5	0.3
Benzo(b)fluoranthene	3.3	0.47
Benzo(g,h,i)perylene	1.5	0.68
Dibenzo(a,h)anthracene	0.4	0.1
Fluoranthene	6.8	0.56
Fluorene	0.67	0.12
Indeno(1,2,3-cd)pyrene	1.7	0.23
Nephthalene	0.21	0.09
Phenanthrene	5.2	0.69
Pyrene	5.2	1.0

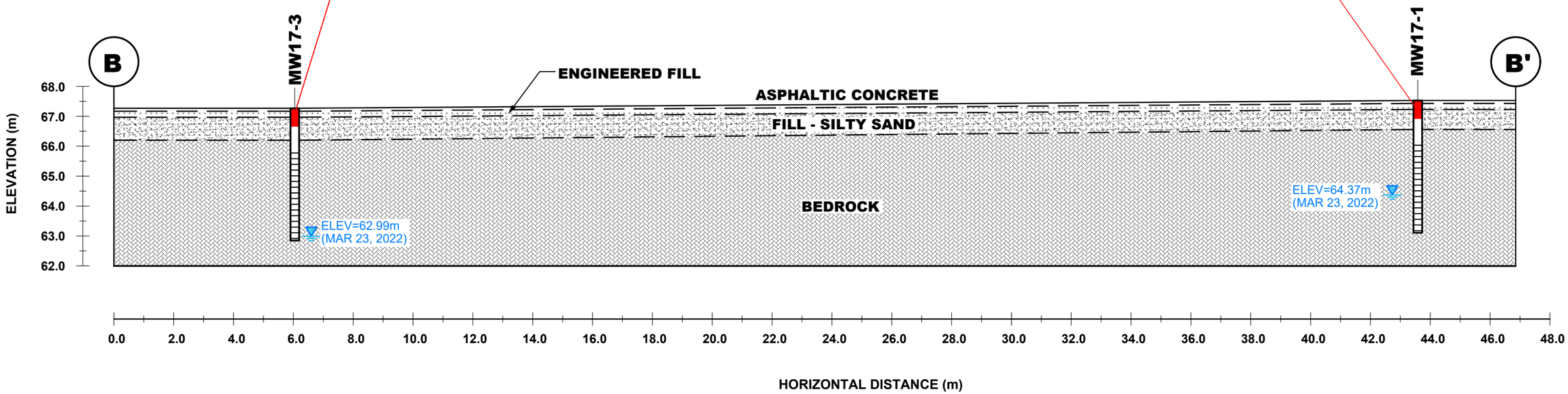
Remaining PAHs comply with the MECP Table 1 Standards

MW17-1GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Benzo(a)anthracene	0.36	0.36
Benzo(a)pyrene	0.42	0.3
Benzo(b)fluoranthene	0.57	0.47
Fluoranthene	0.67	0.56
Indeno(1,2,3-cd)pyrene	0.35	0.23

Remaining PAHs comply with the MECP Table 1 Standards

DUP	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Benzo(a)anthracene	0.41	0.36
Benzo(a)pyrene	0.48	0.3
Benzo(b)fluoranthene	0.63	0.47
Fluoranthene	0.78	0.56
Indeno(1,2,3-cd)pyrene	0.95	0.23

Remaining PAHs comply with the MECP Table 1 Standards



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (PAHs)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-5B
Approved by: MB	Revision No.:

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11x17

#388 WINSTON AVE. RESIDENTIAL

#390 WINSTON AVE. RESIDENTIAL

#392 WINSTON AVE. RESIDENTIAL

#394 WINSTON AVE. RESIDENTIAL

#396 WINSTON AVE. RESIDENTIAL

#399 DANFORTH AVENUE COMMERCIAL

#411 ROOSEVELT AVENUE COMMERCIAL / OFFICE BUILDING

#385 ROOSEVELT AVENUE RESIDENTIAL

#387 ROOSEVELT AVENUE RESIDENTIAL

MW17-2GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.052	0.05
Remaining VOCs comply with the MECP Table 1 Standards		

A

MW17-2
67.35
(65.49)

FORMER BUILDING FOOTPRINT

FORMER BUILDING FOOTPRINT

#403 RICHMOND ROAD
TUBMAN FUNERAL HOMES

ASPHALTIC CONCRETE

#389 RICHMOND ROAD
RESIDENTIAL

SHED

FORMER BUILDING FOOTPRINTS

PAD-MOUNTED TRANSFORMER

B

MW17-3
67.37
(62.99)

CANOPY

B'

MW17-1
67.62
(64.37)

ASPHALTIC CONCRETE

A'

R I C H M O N D R O A D

R O O S E V E L T A V E N U E

MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.058	0.05
Remaining VOCs comply with the MECP Table 1 Standards		

MW17-1GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.14	0.05
Xylenes	0.15	0.05
Remaining VOCs comply with the MECP Table 1 Standards		

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#386 ROOSEVELT AVENUE RESIDENTIAL

#390 ROOSEVELT AVENUE RESIDENTIAL

#3 RESIDENTIAL

VENUE RESIDENTIAL

#402 ROOSEVELT AVENUE RESIDENTIAL

#415 RICHMOND ROAD COMMERCIAL

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
- 67.62 GROUND SURFACE ELEVATION (m)
- (64.37) GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A — A' CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

patersongroup
consulting engineers

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL (VOCs)

Scale: 1:300	**Date:** 04/2022
Drawn by: YA	**Report No.:** PE4744-1
Checked by: MW	**Dwg. No.:** PE4744-6
Approved by: MB	**Revision No.:**

11x17

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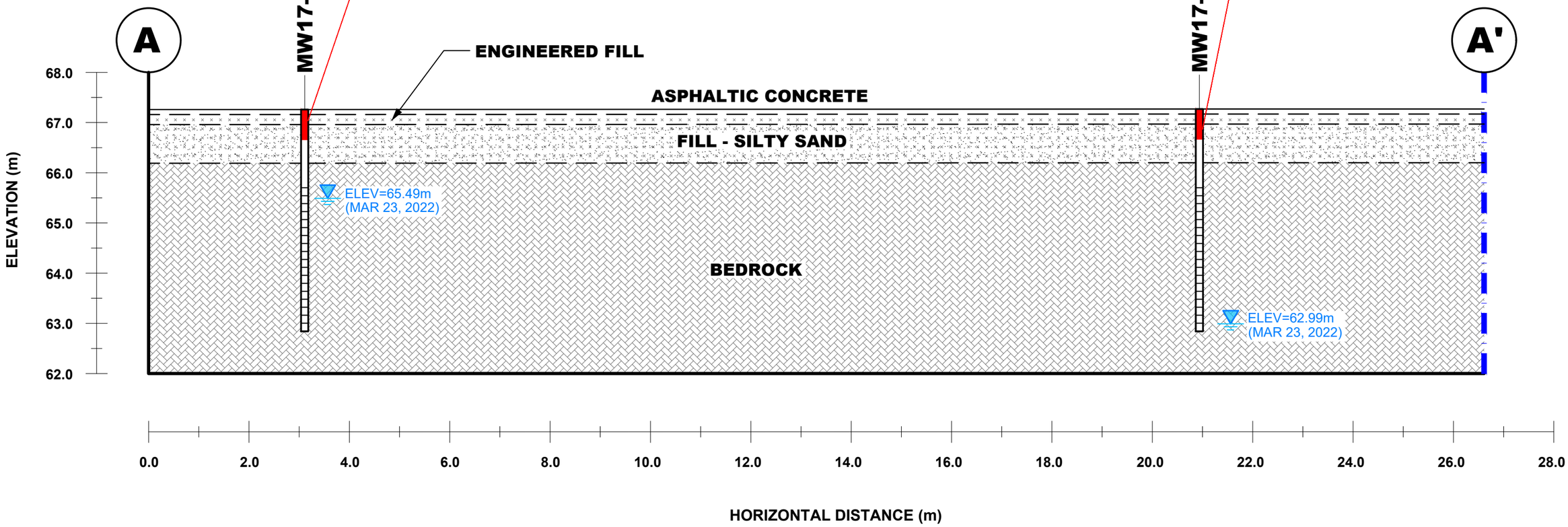
MW17-2GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.052	0.05
Remaining VOCs comply with the MECP Table 1 Standards		

MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.058	0.05
Remaining VOCs comply with the MECP Table 1 Standards		



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (VOCs)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-6A
Approved by: MB	Revision No.:

11x17

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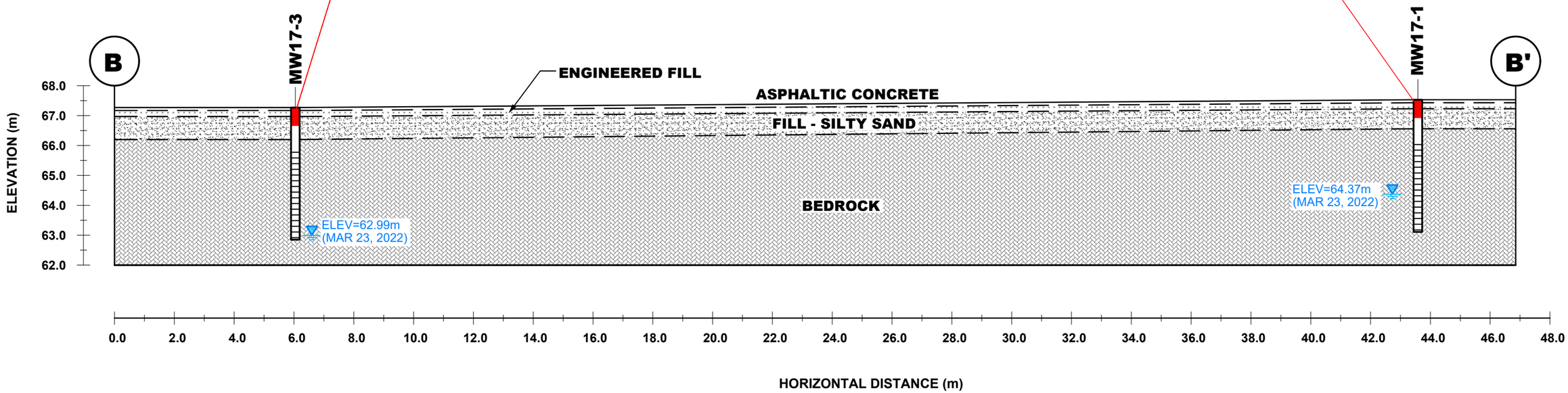
MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.058	0.05
Remaining VOCs comply with the MECP Table 1 Standards		

MW17-1GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Hexane	0.14	0.05
Xylenes	0.15	0.05
Remaining VOCs comply with the MECP Table 1 Standards		



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION B-B' - SOIL (VOCs)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-6B
Approved by: MB	Revision No.:

11x17

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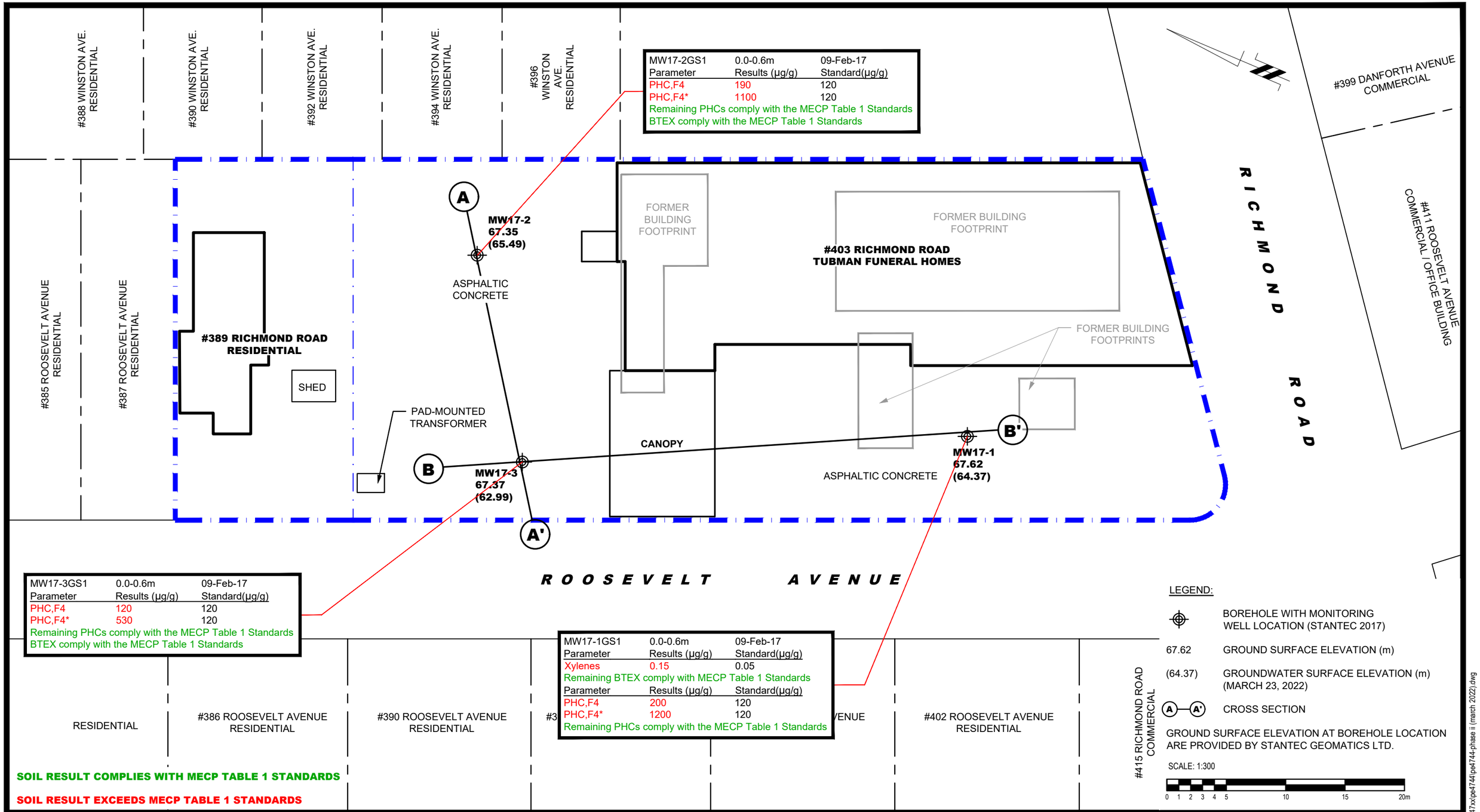

MW17-2GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	190	120
PHC,F4*	1100	120

Remaining PHCs comply with the MECP Table 1 Standards
BTEX comply with the MECP Table 1 Standards

MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	120	120
PHC,F4*	530	120

Remaining PHCs comply with the MECP Table 1 Standards
BTEX comply with the MECP Table 1 Standards

MW17-1GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Xylenes	0.15	0.05

Remaining BTEX comply with MECP Table 1 Standards

Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	200	120
PHC,F4*	1200	120

Remaining PHCs comply with the MECP Table 1 Standards

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
- 67.62 — GROUND SURFACE ELEVATION (m)
- (64.37) — GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A — A' — CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

patersongroup
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Ottawa, Ontario K2E 7J5
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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL (BTEX, PHCs)

Scale: 1:300	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-7
Approved by: MB	Revision No.:

11x17

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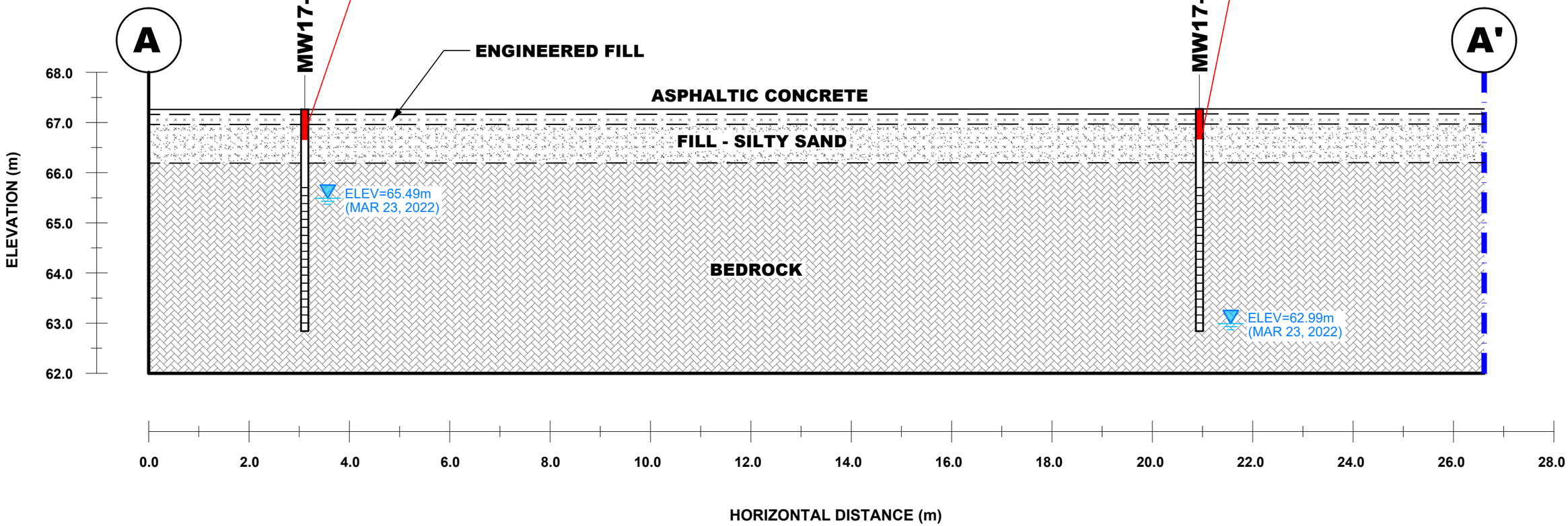
MW17-2GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	190	120
PHC,F4*	1100	120

Remaining PHCs comply with the MECP Table 1 Standards
BTEX comply with the MECP Table 1 Standards

MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	120	120
PHC,F4*	530	120

Remaining PHCs comply with the MECP Table 1 Standards
BTEX comply with the MECP Table 1 Standards



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

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

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-7A
Approved by: MB	Revision No.:

11x17

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MW17-3GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	120	120
PHC,F4*	530	120

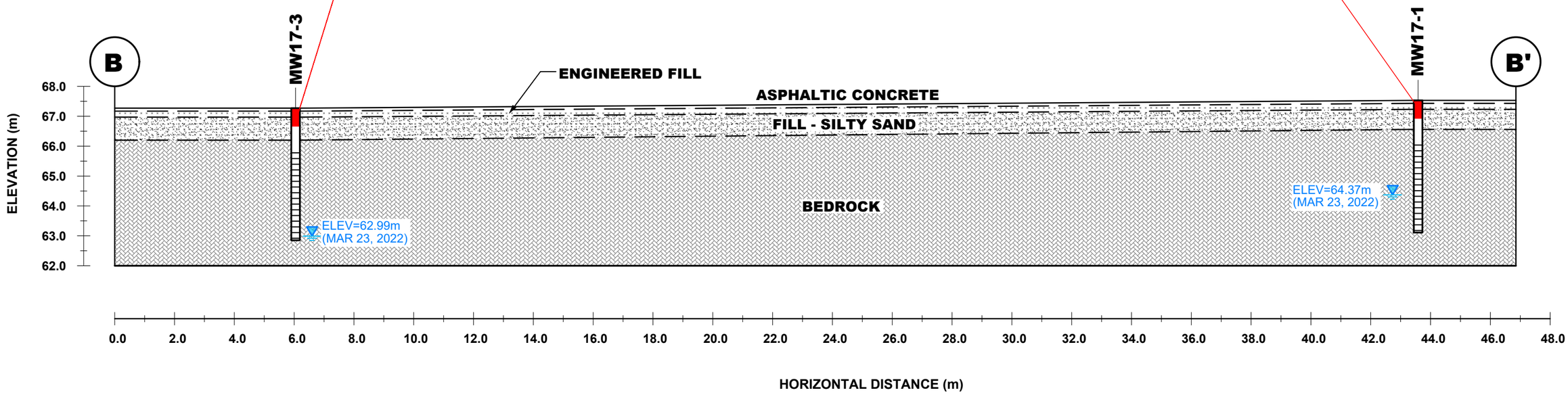
Remaining PHCs comply with the MECP Table 1 Standards
BTEX comply with the MECP Table 1 Standards

MW17-1GS1	0.0-0.6m	09-Feb-17
Parameter	Results (µg/g)	Standard(µg/g)
Xylenes	0.15	0.05

Remaining BTEX comply with MECP Table 1 Standards

Parameter	Results (µg/g)	Standard(µg/g)
PHC,F4	200	120
PHC,F4*	1200	120

Remaining PHCs comply with the MECP Table 1 Standards



SOIL RESULT COMPLIES WITH MECP TABLE 1 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 1 STANDARDS

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STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

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

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-7B
Approved by: MB	Revision No.:

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MW17-2	1.42-4.42m	16-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
PHC-F3	1200	500
BTEX, VOCs and Remaining PHCs comply with MECP Table 1 Standards		
MW17-2	1.42-4.42m	28-Feb-17
BTEX, PHCs and VOCs comply with MECP Table 1 Standards		
MW17-2-GW	1.42-4.42m	23-Mar-22
PHCs comply with MECP Table 1 Standards		

A

MW17-2
67.35
(65.49)

FORMER BUILDING FOOTPRINT

FORMER BUILDING FOOTPRINT

#403 RICHMOND ROAD
TUBMAN FUNERAL HOMES

ASPHALTIC CONCRETE

#389 RICHMOND ROAD
RESIDENTIAL

SHED

PAD-MOUNTED TRANSFORMER

FORMER BUILDING FOOTPRINTS

CANOPY

B

MW17-3
67.37
(62.99)

B'

MW17-1
67.62
(64.37)

ASPHALTIC CONCRETE

A'

R O O S E V E L T A V E N U E

R I C H M O N D R O A D

MW17-3	1.42-4.42m	17-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
Benzene	0.5	0.89
Toluene	0.87	0.8
PHCs and all other BTEX/VOCs comply with MECP Table 1 Standards		
MW17-3	1.42-4.42m	28-Feb-17
PHC-F2 comply with MECP Table 1 Standards		
MW17-3	1.42-4.42m	13-Sep-19
BTEX/VOCs comply with MECP Table 1 Standards		
MW17-3-GW	1.42-4.42m	23-Mar-22
BTEX comply with MECP Table 1 Standards		

MW17-1	1.42-4.42m	17-Feb-17
BTEX, PHCs and VOCs comply with MECP Table 1 Standards		

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#394-396 ROOSEVELT AVENUE RESIDENTIAL

#398 ROOSEVELT AVENUE RESIDENTIAL

#402 ROOSEVELT AVENUE RESIDENTIAL

#415 RICHMOND ROAD COMMERCIAL

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
- 67.62 GROUND SURFACE ELEVATION (m)
- (64.37) GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A—A' CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 1 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 1 STANDARDS

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STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:
ANALYTICAL TESTING PLAN - GROUNDWATER (BTEX, PHCs, VOCs)

Scale: 1:300	Date: 08/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-8
Approved by: MB	Revision No.:

11x17

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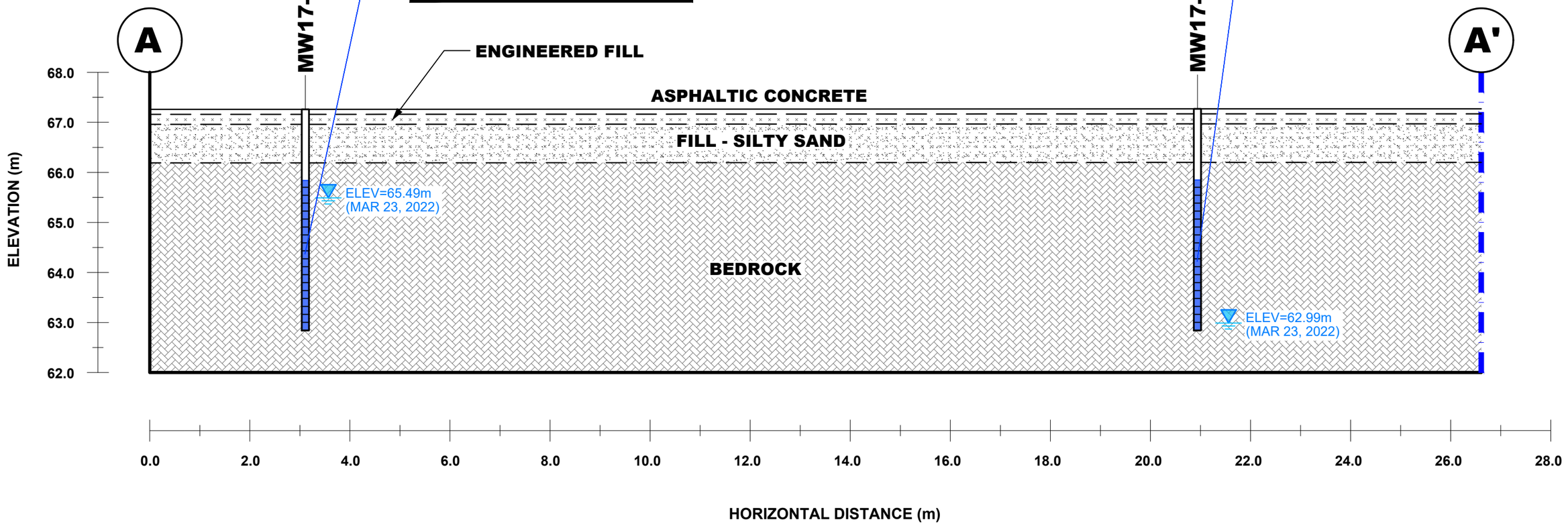
MW17-2	1.42-4.42m	16-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
PHC-F3	1200	500
BTEX, VOCs and Remaining PHCs comply with MECP Table 1 Standards		
MW17-2	1.42-4.42m	28-Feb-17
BTEX, PHCs and VOCs comply with MECP Table 1 Standards		
MW17-2-GW	1.42-4.42m	23-Mar-22
PHCs comply with MECP Table 1 Standards		

MW17-3	1.42-4.42m	17-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
Benzene	0.5	0.89
Toluene	0.87	0.8
PHCs and all other BTEX/VOCs comply with MECP Table 1 Standards		
MW17-3	1.42-4.42m	28-Feb-17
PHC-F2 comply with MECP Table 1 Standards		
MW17-3	1.42-4.42m	13-Sep-19
BTEX/VOCs comply with MECP Table 1 Standards		
MW17-3-GW	1.42-4.42m	23-Mar-22
BTEX comply with MECP Table 1 Standards		



GROUNDWATER RESULTS COMPLY WITH MECP TABLE 1 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 1 STANDARDS

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:
CROSS SECTION A-A' - GROUNDWATER (BTEX, PHCs,VOCs)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-8A
Approved by: MB	Revision No.:

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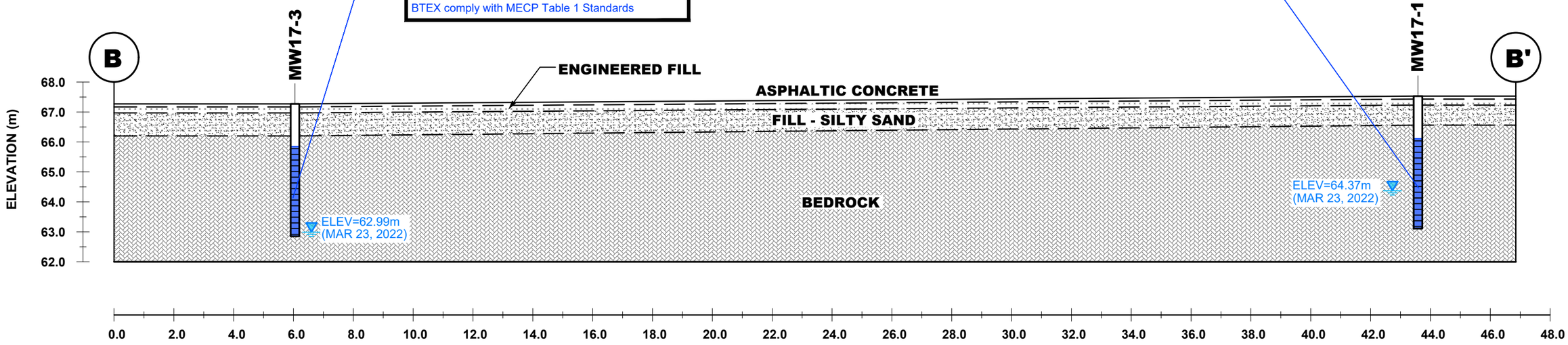
11x17

MW17-3	1.42-4.42m	17-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
Benzene	0.5	0.89
Toluene	0.87	0.8
PHCs and all other BTEX/VOCs comply with MECP Table 1 Standards		
MW17-3	1.42-4.42m	28-Feb-17
PHC-F2 comply with MECP Table 1 Standards		
MW17-3	1.42-4.42m	13-Sep-19
BTEX/VOCs comply with MECP Table 1 Standards		
MW17-3-GW	1.42-4.42m	23-Mar-22
BTEX comply with MECP Table 1 Standards		

MW17-1	1.42-4.42m	17-Feb-17
BTEX, PHCs and VOCs comply with MECP Table 1 Standards		



GROUNDWATER RESULTS COMPLY WITH MECP TABLE 1 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 1 STANDARDS

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STARWOOD GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:
CROSS SECTION B-B' - GROUNDWATER (BTEX, PHCs,VOCs)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-8B
Approved by: MB	Revision No.:

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ASPHALTIC CONCRETE

A

MW17-2
67.35
(65.49)

B

MW17-3
67.37
(62.99)

A'

CANOPY

FORMER BUILDING FOOTPRINT

FORMER BUILDING FOOTPRINT

#403 RICHMOND ROAD
TUBMAN FUNERAL HOMES

FORMER BUILDING FOOTPRINTS

ASPHALTIC CONCRETE

B'

MW17-1
67.62
(64.37)

RICHMOND ROAD
COMMERCIAL

R I C H M O N D R O A D

#399 DANFORTH AVENUE
COMMERCIAL

#411 ROOSEVELT AVENUE
COMMERCIAL / OFFICE BUILDING

MW17-2	1.42-4.42m	28-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
Sodium	580000	490000

PAHs Remaining Metals comply with MECP Table 1 Standards

MW17-2	1.42-4.42m	12-Sept-19

Sodium comply with MECP Table 7 Standards

MW17-3	1.42-4.42m	28-Feb-17

Metals and PAHs comply with MECP Table 1 Standards

MW17-1	1.42-4.42m	28-Feb-17
Parameter	Results (µg/L)	Standard(µg/L)
Benzo(a)pyrene	0.03	0.01

Remaining PAHs and Metals comply with MECP Table 1 Standards

MW17-1-GW1	1.42-4.42m	13-Sep-19
Parameter	Results (µg/L)	Standard(µg/L)
Acenaphthylene	1.19	1
Anthracene	0.52	0.2
Benzo(a)anthracene	1.65	0.2
Benzo(a)pyrene	2.74	0.01
Benzo(b)fluoranthene	3.74	0.1
Benzo(g,h,i)perylene	2.47	0.2
Benxo(k)fluoranthene	1.91	0.1
Chrysene	1.64	0.1
Fluoranthene	2.01	0.4
Indeno(1,2,3-cd)pyrene	2.38	0.2
Phenanthrene	0.33	0.1
Pyrene	2.31	0.2

MW17-1-GW1	1.42-4.42m	24-Sep-19
Parameter	Results (µg/L)	Standard(µg/L)
Benzo(a)pyrene	0.04	0.01

Remaining PAHs comply with the MECP Table 1 Standards

MW17-1-GW	1.42-4.42m	23-Mar-22

PAHs comply with MECP Table 1 Standards

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GROUNDWATER RESULTS COMPLY WITH MECP TABLE 1 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 1 STANDARDS

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (STANTEC 2017)
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- (64.37) GROUNDWATER SURFACE ELEVATION (m) (MARCH 23, 2022)
- A — A' CROSS SECTION

GROUND SURFACE ELEVATION AT BOREHOLE LOCATION ARE PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

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NO.	REVISIONS	DATE	INITIAL

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - GROUNDWATER (PAHs, METALS)

Scale: 1:300	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-9
Approved by: MB	Revision No.:

11x17

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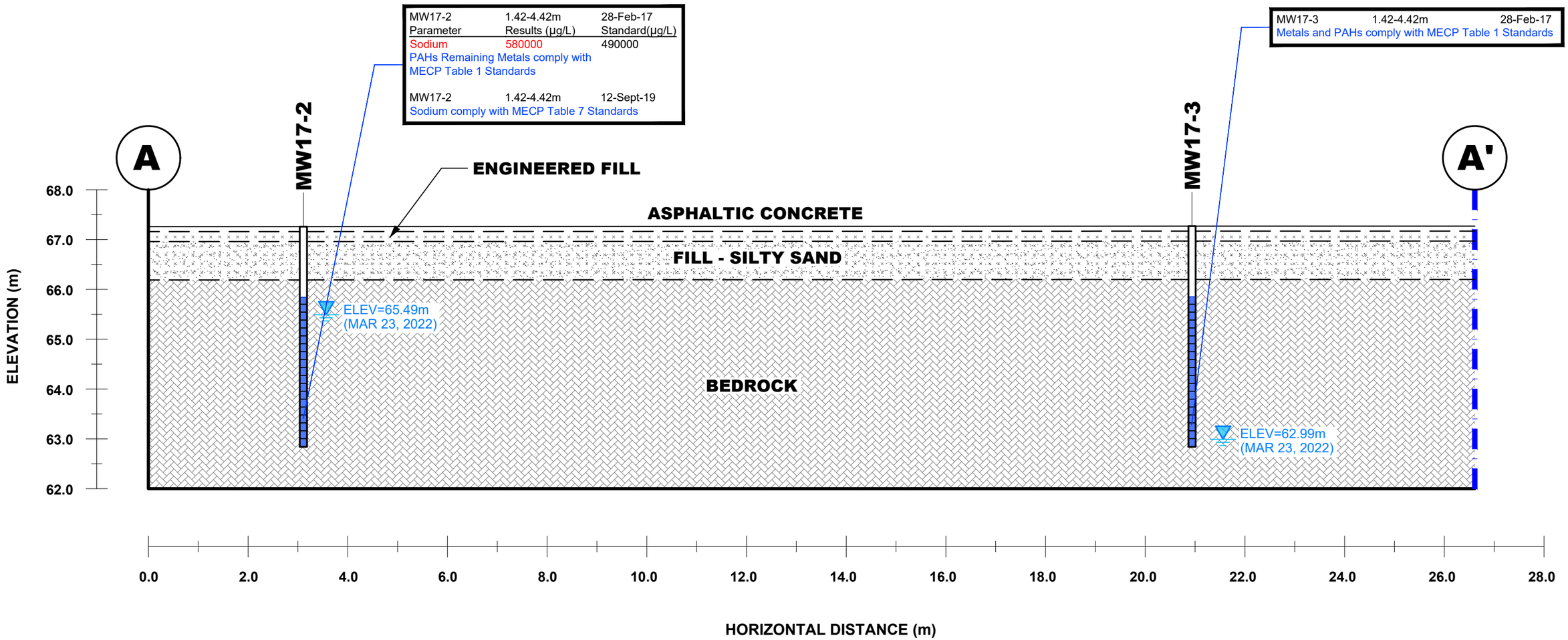

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 1 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 1 STANDARDS

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER (PAHs, METALS)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-9A
Approved by: MB	Revision No.:

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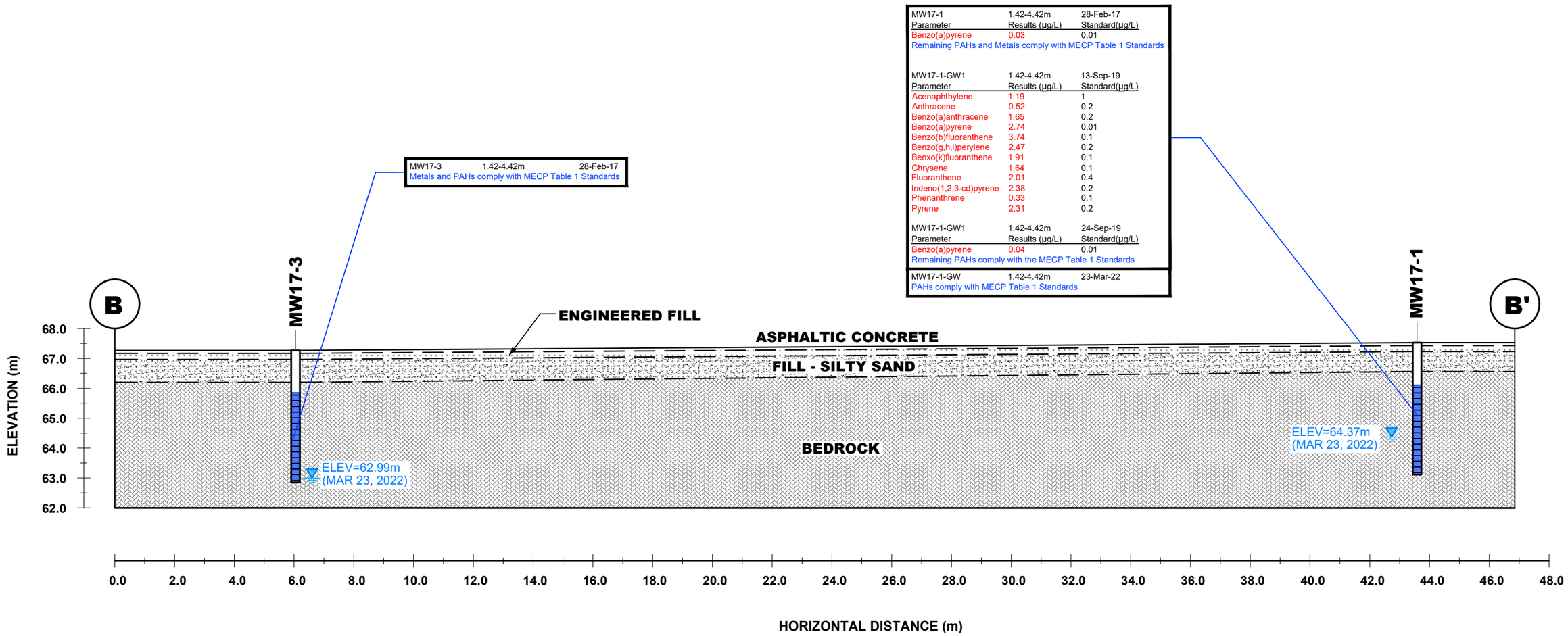

GROUNDWATER RESULTS COMPLY WITH MECP TABLE 1 STANDARDS

GROUNDWATER RESULTS EXCEED MECP TABLE 1 STANDARDS

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
403 RICHMOND ROAD

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER (PAHs, METALS)

Scale: AS SHOWN	Date: 04/2022
Drawn by: YA	Report No.: PE4744-1
Checked by: MW	Dwg. No.: PE4744-9B
Approved by: MB	Revision No.:

11x17

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LIST OF TABLES

Table 1A: Analytical Test Results BTEX and PHCs (F1 - F4)

Parameter	Units	MDL	Regulation	Regulation	MW17-1GS1	MW17-2GS1	MW17-3GS1
Sample Depth (m)			**MECP Table 7 Residential Coarse**	**MECP Table 1 Residential Coarse**	**0.0-0.6m**	**0.0-0.6m**	**0.0-0.6m**
Sample Date					**09-Feb-17**	**09-Feb-17**	**09-Feb-17**
Benzene	ug/g dry	0.02	0.21 ug/g dry	0.02 ug/g dry	<0.02	<0.02	<0.02
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Toluene	ug/g dry	0.05	2.3 ug/g dry	0.2 ug/g dry	0.047	0.03	0.035
Xylenes (Total)	ug/g dry	0.05	3.1 ug/g dry	0.05 ug/g dry	**(0.15)**	0.036	0.033
F1 PHCs (C6-C10)	ug/g dry	7	55 ug/g dry	25 ug/g dry	<10	<10	<10
F2 PHCs (C10-C16)	ug/g dry	4	98 ug/g dry	10 ug/g dry	<10	<10	<10
F3 PHCs (C16-C34)	ug/g dry	8	300 ug/g dry	240 ug/g dry	95	110	130
F4 PHCs (C34-C50)	ug/g dry	6	2800 ug/g dry	120 ug/g dry	**(200)**	**(190)**	120
F4 PHCs (C34-C50)Gravimetric	ug/g dry	6	2800 ug/g dry	120 ug/g dry	**(1200)**	**(1100)**	**(530)**

	Sample exceeds MECP Table 7 Residential Coarse-Grained Standard
(_)	Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd	No concentration identified above the MDL
MDL	Method Detection Limit for Samples Submitted during 2020 Field Program

Table 1B: Analytical Test Results Groundwater BTEX and PHCs (F1 - F4)

Parameter	Units	MDL	Regulation	Regulation	MW17-1	MW17-1	MW17-1	MW17-2	MW17-2	DUP (MW17-2)	MW17-2-GW	MW17-3	MW17-3	MW17-3-GW1	MW17-3-GW
Screened Interval (m)			MECP Table 7 Non-Potable, Coarse	MECP Table 1 Non-Potable, Coarse	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42 m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m
Sample Date					17-Feb-17	28-Feb-17	04-Apr-18	16-Feb-17	28-Feb-17	28-Feb-17	23-Mar-22	17-Feb-17	28-Feb-17	13-Sep-19	23-Mar-22
Benzene	ug/L	0.5	44 ug/L	0.5 ug/L	0.15	<0.1	nd	<0.1	N/A	N/A	N/A	(0.89)	N/A	nd	nd
Ethylbenzene	ug/L	0.5	2300 ug/L	0.5 ug/L	<0.1	<0.1	nd	<0.1	N/A	N/A	N/A	0.1	N/A	nd	nd
Toluene	ug/L	0.5	18000 ug/L	0.8 ug/L	<0.2	<0.2	nd	<0.2	N/A	N/A	N/A	(0.87)	N/A	nd	nd
Xylenes, total	ug/L	0.5	4200 ug/L	72 ug/L	0.18	<0.1	nd	<0.1	N/A	N/A	N/A	0.63	N/A	nd	nd
F1 PHCs (C6-C10)	ug/L	25	750 ug/L	420 ug/L	<25	<25	nd	<25	N/A	N/A	<25	<25	<25	N/A	N/A
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	150 ug/L	<100	<100	nd	<100	<100	<100	<100	<100	N/A	N/A	N/A
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	500 ug/L	<200	<200	nd	(1200)	<200	<200	<200	<200	N/A	N/A	N/A
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	500 ug/L	<200	<200	nd	270	<200	<200	<200	<200	N/A	N/A	N/A

	Sample exceeds MECP Table 7 Residential Coarse-Grained Standard
(_)	Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd	No concentration identified above the MDL
MDL	Method Detection Limit for Samples Submitted during the Field Program
N/A	Parameter Not Analyzed

Table 2A: Soil Analytical Test Results Metals

Parameter	Units	MDL	Regulation	Regulation	MW17-1GS1	MW17-2GS1	MW17-3GS1
Sample Depth (m)			**MECP Table 7 Residential Coarse**	**MECP Table 1 Residential Coarse**	**0.0-0.6m**	**0.0-0.6m**	**0.0-0.6m**
Sample Date					**09-Feb-17**	**09-Feb-17**	**09-Feb-17**
Chromium (VI)	ug/g dry	0.2	8 ug/g dry	0.66 ug/g dry	<0.2	<0.2	<0.2
Mercury	ug/g dry	0.05	0.27 ug/g dry	0.27 ug/g dry	0.091	0.08	0.067
Antimony	ug/g dry	1	7.5 ug/g dry	1.3 ug/g dry	0.9	1.6	0.64
Arsenic	ug/g dry	1	18 ug/g dry	18 ug/g dry	1.6	4.45	2.4
Barium	ug/g dry	1	390 ug/g dry	220 ug/g dry	130	140	160
Beryllium	ug/g dry	0.5	4 ug/g dry	2.5 ug/g dry	0.29	0.42	0.33
Boron	ug/g dry	5	120 ug/g dry	36 ug/g dry	11	12	7.3
Boron (Available)	ug/g dry	5	1.2 ug/g dry		0.52	0.5	0.37
Cadmium	ug/g dry	0.5	1.2 ug/g dry	1.2 ug/g dry	0.23	0.2	0.19
Chromium	ug/g dry	5	160 ug/g dry	70 ug/g dry	14	19	18
Cobalt	ug/g dry	1	22 ug/g dry	21 ug/g dry	3.8	6.1	5.5
Copper	ug/g dry	5	140 ug/g dry	92 ug/g dry	11	36	19
Lead	ug/g dry	1	120 ug/g dry	120 ug/g dry	83	89	**(140)**
Molybdenum	ug/g dry	1	6.9 ug/g dry	2 ug/g dry	<0.5	0.85	0.72
Nickel	ug/g dry	5	100 ug/g dry	82 ug/g dry	8.8	15	12
Selenium	ug/g dry	1	2.4 ug/g dry	1.5 ug/g dry	<0.5	<0.5	<0.5
Silver	ug/g dry	0.3	20 ug/g dry	0.5 ug/g dry	<0.2	<0.2	<0.2
Thallium	ug/g dry	1	1 ug/g dry	1 ug/g dry	0.16	0.28	0.21
Uranium	ug/g dry	1	23 ug/g dry	2.5 ug/g dry	0.38	0.41	0.49
Vanadium	ug/g dry	10	86 ug/g dry	86 ug/g dry	13	17	19
Zinc	ug/g dry	20	340 ug/g dry	290 ug/g dry	69	100	77

Sample exceeds MOECC Table 3 Residential Coarse-Grained Standard
(_) Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd No concentration identified above the MDL
MDL Method Detection Limit for Samples Submitted during 2020 Field Program

Table 2B: Analytical Test Results Groundwater Metals

Parameter	Units	MDL	Regulation	Regulation	MW17-1	MW17-2	MW17-2-GW1	MW17-3
Screened Interval (m)			**MECP Table 7 Non-Potable, Coarse**	**MECP Table 1 Non-Potable, Coarse**	**1.42-4.42m**	**1.42-4.42m**	**1.42-4.42m**	**1.42-4.42m**
Sample Date					**28-Feb-17**	**28-Feb-17**	**13-Sep-19**	**28-Feb-17**
Antimony	ug/L	0.5	16000 ug/L	1.5 ug/L	0.61	0.56	N/A	<0.5
Arsenic	ug/L	1	1500 ug/L	13 ug/L	<1.0	<1.0	N/A	<1.0
Barium	ug/L	1	23000 ug/L	610 ug/L	110	65	N/A	51
Beryllium	ug/L	0.5	53 ug/L	0.5 ug/L	<5.0	<5.0	N/A	<5.0
Boron	ug/L	10	36000 ug/L	1700 ug/L	240	130	N/A	50
Cadmium	ug/L	0.1	2.1 ug/L	0.5 ug/L	0.1	<0.1	N/A	<0.1
Chromium	ug/L	1	640 ug/L	11 ug/L	<5.0	<5.0	N/A	<5.0
Chromium (VI)	ug/L	10	25 ug/L	25 ug/L	<0.5	<0.5	N/A	<0.5
Cobalt	ug/L	0.5	52 ug/L	3.8 ug/L	0.92	<0.5	N/A	<0.5
Copper	ug/L	0.5	69 ug/L	5 ug/L	1.3	1.9	N/A	1.1
Lead	ug/L	0.1	20 ug/L	1.9 ug/L	<0.5	<0.5	N/A	<0.5
Mercury	ug/L	0.1	0.1 ug/L	0.1 ug/L	<0.1	<0.1	N/A	<0.1
Molybdenum	ug/L	0.5	7300 ug/L	23 ug/L	3.5	0.66	N/A	<0.5
Nickel	ug/L	1	390 ug/L	14 ug/L	9.2	2.3	N/A	2.5
Selenium	ug/L	1	50 ug/L	5 ug/L	<2.0	2.2	N/A	<2.0
Silver	ug/L	0.1	1.2 ug/L	0.3 ug/L	<0.1	<0.1	N/A	<0.1
Sodium	ug/L	200	1800000 ug/L	490000ug/L	320000	**(580000)**	416000	180000
Thallium	ug/L	0.1	400 ug/L	0.5 ug/L	0.13	0.10	N/A	0.073
Uranium	ug/L	0.1	330 ug/L	8.9 ug/L	1.8	0.94	N/A	0.97
Vanadium	ug/L	0.5	200 ug/L	3.9 ug/L	<0.5	<1.0	N/A	<0.5
Zinc	ug/L	5	890 ug/L	160 ug/L	<5.0	<5.0	N/A	<5.0

	Sample exceeds MECP Table 7 Residential Coarse-Grained Standard
(_)	Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd	No concentration identified above the MDL
MDL	Method Detection Limit for Samples Submitted during the Field Program
N/A	Parameter Not Analyzed

Table 3A: Analytical Test Results PAHs

Parameter	Units	MDL	Regulation	Regulation	MW17-1GS1	DUP (MW17-1GS)	MW17-2GS1	MW17-3GS1
Sample Depth (m)			**MECP Table 7 Residential Coarse**	**MECP Table 1 Residential Coarse**	**0.0-0.6m**	**0.0-0.6m**	**0.0-0.6m**	**0.0-0.6m**
Sample Date					**09-Feb-17**	**09-Feb-17**	**09-Feb-17**	**09-Feb-17**
Acenaphthene	ug/g dry	0.02	7.9 ug/g dry	0.072 ug/g dry	<0.05	<0.05	**(0.12)**	**(0.44)**
Acenaphthylene	ug/g dry	0.02	0.15 ug/g dry	0.093 ug/g dry	0.066	0.076	0.091	**(0.18)**
Anthracene	ug/g dry	0.02	0.67 ug/g dry	0.16 ug/g dry	0.12	0.14	**(0.35)**	**(1.4)**
Benzo[a]anthracene	ug/g dry	0.02	0.5 ug/g dry	0.36 ug/g dry	**(0.36)**	**(0.41)**	**(1.1)**	**(2.9)**
Benzo[a]pyrene	ug/g dry	0.02	0.3 ug/g dry	0.3 ug/g dry	**(0.42)**	**(0.48)**	**(1.1)**	**(2.5)**
Benzo[b]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	0.47 ug/g dry	**(0.57)**	**(0.63)**	**(1.5)**	**(3.3)**
Benzo[g,h,i]perylene	ug/g dry	0.02	6.6 ug/g dry	0.68 ug/g dry	0.33	0.37	**(0.73)**	**(1.5)**
Benzo[k]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	0.48 ug/g dry	0.19	0.23	**(0.55)**	1.2
Chrysene	ug/g dry	0.02	7 ug/g dry	2.8 ug/g dry	0.34	0.38	0.95	2.4
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1 ug/g dry	0.1 ug/g dry	0.073	0.079	**(0.19)**	**(0.4)**
Fluoranthene	ug/g dry	0.02	0.69 ug/g dry	0.56 ug/g dry	**(0.67)**	**(0.78)**	**(2.3)**	**(6.8)**
Fluorene	ug/g dry	0.02	62 ug/g dry	0.12 ug/g dry	<0.05	<0.05	**(0.12)**	**(0.67)**
Indeno [1,2,3-cd] pyrene	ug/g dry	0.02	0.38 ug/g dry	0.23 ug/g dry	**(0.35)**	**(0.39)**	**(0.83)**	**(1.7)**
1-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	0.59 ug/g dry	<0.05	<0.05	<0.05	0.13
2-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	0.59 ug/g dry	<0.05	<0.05	<0.05	0.19
Methylnaphthalene (1&2)	ug/g dry	0.04	0.99 ug/g dry	0.59 ug/g dry	<0.071	<0.071	<0.071	0.31
Naphthalene	ug/g dry	0.01	0.6 ug/g dry	0.09 ug/g dry	0.051	<0.05	<0.05	**(0.21)**
Phenanthrene	ug/g dry	0.02	6.2 ug/g dry	0.69 ug/g dry	0.42	0.46	**(1.4)**	**(5.2)**
Pyrene	ug/g dry	0.02	78 ug/g dry	1 ug/g dry	0.56	0.65	**(1.9)**	**(5.2)**

	Sample exceeds MECP Table 7 Residential Coarse-Grained Standard
(_)	Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd	No concentration identified above the MDL
MDL	Method Detection Limit for Samples Submitted during 2020 Field Program
N/A	Parameter Not Analyzec

Table 3B: Analytical Test Results Groundwater PAHs

Parameter	Units	MDL	Regulation	Regulation	MW17-1	MW17-1-GW1	MW17-1-GW2	MW17-1-GW	MW17-2	(DUP) MW17-2	MW17-3
Screened Interval (m)			MECP Table 7 Non-Potable, Coarse	MECP Table 1 Non-Potable, Coarse	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m	1.42-4.42m
Sample Date					28-Feb-17	13-Sep-19	24-Sep-19	23-Mar-22	28-Feb-17	28-Feb-17	28-Feb-17
Acenaphthene	ug/L	0.05	17 ug/L	4.1 ug/L	<0.05	nd	nd	nd	<0.05	<0.05	<0.05
Acenaphthylene	ug/L	0.05	1 ug/L	1 ug/L	<0.05	**(1.19)**	nd	nd	<0.05	<0.05	<0.05
Anthracene	ug/L	0.01	1 ug/L	0.1 ug/L	<0.05	**(0.52)**	nd	nd	<0.05	<0.05	<0.05
Benzo[a]anthracene	ug/L	0.01	1.8 ug/L	0.2 ug/L	<0.05	**(1.65)**	nd	nd	<0.05	<0.05	<0.05
Benzo[a]pyrene	ug/L	0.01	0.81 ug/L	0.01 ug/L	**(0.03)**	**(2.74)**	**(0.04)**	nd	<0.01	<0.01	<0.01
Benzo[b]fluoranthene	ug/L	0.05	0.75 ug/L	0.1 ug/L	0.05	**(3.74)**	nd	nd	<0.05	<0.05	<0.05
Benzo[g,h,i]perylene	ug/L	0.05	0.2 ug/L	0.2 ug/L	<0.05	**(2.47)**	nd	nd	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	ug/L	0.05	0.4 ug/L	0.1 ug/L	<0.05	**(1.91)**	nd	nd	<0.05	<0.05	<0.05
Chrysene	ug/L	0.05	0.7 ug/L	0.1 ug/L	<0.05	**(1.64)**	nd	nd	<0.05	<0.05	<0.05
Dibenzo[a,h]anthracene	ug/L	0.05	0.4 ug/L	0.2 ug/L	<0.05	**(0.65)**	nd	nd	<0.05	<0.05	<0.05
Fluoranthene	ug/L	0.01	44 ug/L	0.4 ug/L	0.07	**(2.01)**	0.02	0.02	<0.05	<0.05	<0.05
Fluorene	ug/L	0.05	290 ug/L	120 ug/L	<0.05	nd	nd	nd	<0.05	<0.05	<0.05
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2 ug/L	0.2 ug/L	<0.05	**(2.38)**	nd	nd	<0.05	<0.05	<0.05
1-Methylnaphthalene	ug/L	0.05	1500 ug/L	2 ug/L	<0.05	nd	nd	0.42	<0.05	<0.05	<0.05
2-Methylnaphthalene	ug/L	0.05	1500 ug/L	2 ug/L	<0.05	nd	nd	0.13	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	ug/L	0.10	1500 ug/L	2 ug/L	<0.071	nd	nd	0.54	<0.071	<0.05	<0.071
Naphthalene	ug/L	0.05	7 ug/L	7 ug/L	<0.05	0.05	nd	nd	<0.05	<0.05	<0.05
Phenanthrene	ug/L	0.05	380 ug/L	0.1 ug/L	<0.05	**(0.33)**	nd	nd	<0.05	<0.05	<0.05
Pyrene	ug/L	0.01	5.7 ug/L	0.2 ug/L	<0.05	**(2.31)**	nd	0.03	<0.05	<0.05	<0.05

	Sample exceeds MECP Table 7 Residential Coarse-Grained Standard
(_)	Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd	No concentration identified above the MDL
MDL	Method Detection Limit for Samples Submitted during the Field Program

Table 4A: Analytical Test Results VOCs

Parameter	Units	MDL	Regulation	Regulation	MW17-1GS1	MW17-2GS1	MW17-3GS1
Sample Depth (m)			MECP Table 7 Residential Coarse	MECP Table 1 Residential Coarse	0.0-0.6m	0.0-0.6m	0.0-0.6m
Sample Date					09-Feb-17	09-Feb-17	09-Feb-17
Acetone	ug/g dry	0.50	16 ug/g dry	0.5 ug/g dry	<0.5	<0.5	<0.5
Benzene	ug/g dry	0.02	0.21 ug/g dry	0.02 ug/g dry	<0.02	<0.02	<0.02
Bromodichloromethane	ug/g dry	0.05	13 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Bromoform	ug/g dry	0.05	0.27 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Bromomethane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Chlorobenzene	ug/g dry	0.05	2.4 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Chloroform	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Dibromochloromethane	ug/g dry	0.05	9.4 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Dichlorodifluoromethane	ug/g dry	0.05	16 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/g dry	0.05	3.4 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g dry	0.05	4.8 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/g dry	0.05	0.083 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,1-Dichloroethane	ug/g dry	0.05	3.5 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,2-Dichloroethane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,1-Dichloroethylene	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	ug/g dry	0.05	3.4 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.084 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,2-Dichloropropane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	ug/g dry	0.05			<0.03	<0.03	<0.03
trans-1,3-Dichloropropylene	ug/g dry	0.05			<0.04	<0.04	<0.04
1,3-Dichloropropene, total	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	0.05 ug/g dry	<0.02	<0.02	<0.02
Ethylene dibromide	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Hexane	ug/g dry	0.05	2.8 ug/g dry	0.05 ug/g dry	**(0.14)**	**(0.052)**	**(0.058)**
Methyl Ethyl Ketone	ug/g dry	0.50	16 ug/g dry	0.5 ug/g dry	<0.5	<0.5	<0.5
Methyl Isobutyl Ketone	ug/g dry	0.50	1.7 ug/g dry	0.5 ug/g dry	<0.5	<0.5	<0.5
Methyl tert-butyl ether	ug/g dry	0.05	0.75 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Methylene Chloride	ug/g dry	0.05	0.1 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Styrene	ug/g dry	0.05	0.7 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.058 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Tetrachloroethylene	ug/g dry	0.05	0.28 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Toluene	ug/g dry	0.05	2.3 ug/g dry	0.2 ug/g dry	0.047	0.03	0.035
1,1,1-Trichloroethane	ug/g dry	0.05	0.38 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	ug/g dry	0.05	0.05 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Trichloroethylene	ug/g dry	0.05	0.061 ug/g dry	0.05 ug/g dry	<0.05	<0.05	<0.05
Trichlorofluoromethane	ug/g dry	0.05	4 ug/g dry	0.25 ug/g dry	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g dry	0.02	0.02 ug/g dry	0.02 ug/g dry	<0.02	<0.02	<0.02
m/p-Xylene	ug/g dry	0.05			0.11	0.036	0.033
o-Xylene	ug/g dry	0.05			0.039	<0.02	<0.02
Xylenes, total	ug/g dry	0.05	3.1 ug/g dry	0.05 ug/g dry	**(0.15)**	0.036	0.033

	Sample exceeds MECP Table 7 Residential Coarse-Grained Standard
(_)	Sample exceeds MECP Table 1 Residential Coarse-Grained Standard
nd	No concentration identified above the MDL
MDL	Method Detection Limit for Samples Submitted during 2020 Field Program

Table 4B: Groundwater Analytical Test Results VOCs

Parameter	Units	MDL	Regulation	Regulation	MW17-1	MW17-1	MW17-2	MW17-3	MW17-3-GW
Screened Interval (m)			MECP Table 7 Non-Potable, Coarse	MECP Table 1 Non-Potable, Coarse	1.42-4.42 m	1.42-4.42 m	1.42-4.42 m	1.42-4.42 m	1.42-4.42 m
Sample Date					17-Feb-17	05-Apr-18	16-Feb-17	17-Feb-17	13-Sep-19
Acetone	ug/L	5.0	100000 ug/L	2700 ug/L	12	nd	<10	<10	nd
Benzene	ug/L	0.5	0.5 ug/L	0.5 ug/L	0.15	nd	<0.1	(0.89)	nd
Bromodichloromethane	ug/L	0.5	67000 ug/L	2 ug/L	0.8	nd	<0.1	1.1	nd
Bromoform	ug/L	0.5	5 ug/L	5 ug/L	<0.2	nd	<0.2	<0.2	nd
Bromomethane	ug/L	0.5	0.89 ug/L	0.89 ug/L	<0.5	nd	<0.5	<0.5	nd
Carbon Tetrachloride	ug/L	0.2	0.2 ug/L	0.2 ug/L	<0.1	nd	<0.1	<0.1	nd
Chlorobenzene	ug/L	0.5	140 ug/L	0.5 ug/L	<0.1	nd	<0.1	<0.1	nd
Chloroform	ug/L	0.5	2 ug/L	2 ug/L	(7.3)	nd	<0.1	(7.2)	nd
Dibromochloromethane	ug/L	0.5	65000 ug/L	2 ug/L	<0.2	nd	<0.2	<0.2	nd
Dichlorodifluoromethane	ug/L	1.0	3500 ug/L	590 ug/L	<0.2	nd	<0.2	<0.2	nd
1,2-Dichlorobenzene	ug/L	0.5	150 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
1,3-Dichlorobenzene	ug/L	0.5	7600 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
1,4-Dichlorobenzene	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
1,1-Dichloroethane	ug/L	0.5	11 ug/L	0.5 ug/L	<0.1	nd	<0.1	<0.1	nd
1,2-Dichloroethane	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
1,1-Dichloroethylene	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.1	nd	<0.1	<0.1	nd
cis-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	<0.2	nd	<0.2	<0.2	nd
trans-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	1.6 ug/L	<0.2	nd	<0.2	<0.2	nd
1,2-Dichloropropane	ug/L	0.5	0.58 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
cis-1,3-Dichloropropylene	ug/L	0.5			<0.1	nd	<0.1	<0.1	nd
trans-1,3-Dichloropropylene	ug/L	0.5			<0.1	nd	<0.1	<0.1	nd
1,3-Dichloropropene, total	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.28	nd	<0.28	<0.28	nd
Ethylbenzene	ug/L	0.5	54 ug/L	0.5 ug/L	<0.1	nd	<0.1	<0.1	nd
Ethylene dibromide (dibromoethane, 1,2-)	ug/L	0.2	0.2 ug/L	0.2 ug/L	<0.2	nd	<0.2	<0.2	nd
Hexane	ug/L	1.0	5 ug/L	5 ug/L	<0.2	nd	<0.2	<0.2	nd
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	21000 ug/L	400 ug/L	<0.2	nd	<0.2	<0.2	nd
Methyl Isobutyl Ketone	ug/L	5.0	5200 ug/L	640 ug/L	<0.5	nd	<0.5	<0.5	nd
Methyl tert-butyl ether	ug/L	2.0	15 ug/L	15 ug/L	<0.5	nd	<0.5	<0.5	nd
Methylene Chloride	ug/L	5.0	26 ug/L	5 ug/L	<0.2	nd	<0.2	<0.2	nd
Styrene	ug/L	0.5	43 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1 ug/L	1.1 ug/L	<0.1	nd	<0.1	<0.1	nd
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
Tetrachloroethylene	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
Toluene	ug/L	0.5	320 ug/L	0.8 ug/L	<0.2	nd	<0.2	(0.87)	nd
1,1,1-Trichloroethane	ug/L	0.5	23 ug/L	0.5 ug/L	<0.1	nd	<0.1	<0.1	nd
1,1,2-Trichloroethane	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
Trichloroethylene	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.1	nd	<0.1	<0.1	nd
Trichlorofluoromethane	ug/L	1.0	2000 ug/L	150 ug/L	<0.2	nd	<0.2	<0.2	nd
Vinyl Chloride	ug/L	0.5	0.5 ug/L	0.5 ug/L	<0.2	nd	<0.2	<0.2	nd
m/p-Xylene	ug/L	0.5			0.18	nd	<0.1	0.43	nd
o-Xylene	ug/L	0.5			<0.1	nd	<0.1	0.2	nd
Xylenes, total	ug/L	0.5	72 ug/L	72 ug/L	0.18	2.4	<0.1	0.63	nd

Sample exceeds MECP Table 7 Residential Coarse-Grained Standard

( ) Parameter exceeds the MECP Table 1 Residential Standards

nd No concentration identified above the MDL

MDL Method Detection Limit for Samples Submitted during the Field Program

Table E-1
Summary of Soil Analytical Results - 403 Richmond Road, Ottawa, ON
Phase II ESA and Preliminary Geotechnical Assessment
A.L. Tubman

Sample Location			MW17-1		MW17-2	MW17-3
Sample Date			9-Feb-17	9-Feb-17	9-Feb-17	9-Feb-17
Sample ID			MW17-1 GS1	MW17-1 GS1 Lab-Dup	MW17-2 GS1	MW17-3 GS1
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B728506	B728506	B728506	B728506
Laboratory Sample ID			DWX387	DWX387	DWX388	DWX389
Sample Type	Units	Ontario SCS		Lab Replicate		
General Chemistry						
Available (CaCl2) pH	S.U.	n/v	10.5	-	-	-
Moisture Content	%	n/v	7.5	-	11	9.4
Physical Properties						
Grain Size	%	n/v	FINE	-	-	-
Sieve - #200 (<0.075mm)	%	n/v	54	-	-	-
Sieve - #200 (>0.075mm)	%	n/v	46	-	-	-
Petroleum Hydrocarbons						
PHC F1 (C6-C10 range)	µg/g	$_{57}$[A]	<10	-	<10	<10
PHC F1 (C6-C10 range) minus BTEX	µg/g	25_{57}[A]	<10	-	<10	<10
PHC F2 (>C10-C16 range)	µg/g	10_{115}[A]	<10	-	<10	<10
PHC F3 (>C16-C34 range)	µg/g	240_{68}[A]	95	-	110	130
PHC F4 (>C34-C50 range)	µg/g	120_{510}[A]	**200[A]**	-	**190[A]**	120
PHC F4 (>C34) Gravimetric	µg/g	120_{510}[A]	**1200[A]**	-	**1100[A]**	**530[A]**
Chromatogram to baseline at C50	none	n/v	NO	-	NO	NO
Metals						
Antimony	µg/g	1.3[A]	0.90	-	1.6	0.64
Arsenic	µg/g	18[A]	1.6	-	4.4	2.4
Barium	µg/g	220[A]	130	-	140	160
Beryllium	µg/g	2.5[A]	0.29	-	0.42	0.33
Boron	µg/g	36[A]	11	-	12	7.3
Boron (Available)	µg/g	n/v	0.52	-	0.50	0.37
Cadmium	µg/g	1.2[A]	0.23	-	0.20	0.19
Chromium	µg/g	70[A]	14	-	19	18
Chromium (Hexavalent)	µg/g	0.66[A]	<0.2	-	<0.2	<0.2
Cobalt	µg/g	21[A]	3.8	-	6.1	5.5
Copper	µg/g	92[A]	11	-	36	19
Lead	µg/g	120[A]	84	-	89	**140[A]**
Mercury	µg/g	0.27[A]	0.091	-	0.080	0.067
Molybdenum	µg/g	2[A]	<0.50	-	0.85	0.72
Nickel	µg/g	82[A]	8.8	-	15	12
Selenium	µg/g	1.5[A]	<0.50	-	<0.50	<0.50
Silver	µg/g	0.5[A]	<0.20	-	<0.20	<0.20
Thallium	µg/g	1[A]	0.16	-	0.28	0.21
Uranium	µg/g	2.5[A]	0.38	-	0.41	0.49
Vanadium	µg/g	86[A]	13	-	17	19
Zinc	µg/g	290[A]	69	-	100	77
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	µg/g	0.072[A]	<0.050	<0.050	**0.12[A]**	**0.44[A]**
Acenaphthylene	µg/g	0.093[A]	0.066	0.076	0.091	**0.18[A]**
Anthracene	µg/g	0.16[A]	0.12	0.14	**0.35[A]**	**1.4[A]**
Benzo(a)anthracene	µg/g	0.36[A]	0.36	**0.41[A]**	**1.1[A]**	**2.9[A]**
Benzo(a)pyrene	µg/g	0.3[A]	**0.42[A]**	**0.48[A]**	**1.1[A]**	**2.5[A]**
Benzo(b/j)fluoranthene	µg/g	0.47_{32}[A]	**0.57[A]**	**0.63[A]**	**1.5[A]**	**3.3[A]**
Benzo(g,h,i)perylene	µg/g	0.68[A]	0.33	0.37	**0.73[A]**	**1.5[A]**
Benzo(k)fluoranthene	µg/g	0.48[A]	0.19	0.23	**0.55[A]**	**1.2[A]**
Chrysene	µg/g	2.8[A]	0.34	0.38	0.95	2.4
Dibenzo(a,h)anthracene	µg/g	0.1[A]	0.073	0.079	**0.19[A]**	**0.40[A]**
Fluoranthene	µg/g	0.56[A]	**0.67[A]**	**0.78[A]**	**2.3[A]**	**6.8[A]**
Fluorene	µg/g	0.12[A]	<0.050	<0.050	0.12	**0.67[A]**
Indeno(1,2,3-cd)pyrene	µg/g	0.23[A]	**0.35[A]**	**0.39[A]**	**0.83[A]**	**1.7[A]**
Methylnaphthalene (Total)	µg/g	0.59_{33}[A]	<0.071	-	<0.071	0.31
Methylnaphthalene, 1-	µg/g	$_{33}$[A]	<0.050	<0.050	<0.050	0.13
Methylnaphthalene, 2-	µg/g	$_{33}$[A]	<0.050	<0.050	<0.050	0.19
Naphthalene	µg/g	0.09[A]	0.051	<0.050	<0.050	**0.21[A]**
Phenanthrene	µg/g	0.69[A]	0.42	0.46	**1.4[A]**	**5.2[A]**
Pyrene	µg/g	1[A]	0.56	0.65	**1.9[A]**	**5.2[A]**

See notes on last page

Table E-1
Summary of Soil Analytical Results - 403 Richmond Road, Ottawa, ON
Phase II ESA and Preliminary Geotechnical Assessment
A.L. Tubman

Sample Location			MW17-1		MW17-2	MW17-3
Sample Date			9-Feb-17	9-Feb-17	9-Feb-17	9-Feb-17
Sample ID			MW17-1 GS1	MW17-1 GS1 Lab-Dup	MW17-2 GS1	MW17-3 GS1
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B728506	B728506	B728506	B728506
Laboratory Sample ID			DWX387	DWX387	DWX388	DWX389
Sample Type	Units	Ontario SCS		Lab Replicate		
Volatile Organic Compounds						
Acetone	µg/g	0.5[A]	<0.50	-	<0.50	<0.50
Benzene	µg/g	0.02[A]	<0.020	-	<0.020	<0.020
Bromodichloromethane	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Bromoform (Tribromomethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Bromomethane (Methyl bromide)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Carbon Tetrachloride (Tetrachloromethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Chlorobenzene (Monochlorobenzene)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Chloroform (Trichloromethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dibromochloromethane	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorobenzene, 1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorobenzene, 1,3-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorobenzene, 1,4-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorodifluoromethane (Freon 12)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethane, 1,1-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethane, 1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethene, 1,1-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethene, cis-1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethene, trans-1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloropropane, 1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/g	0.05[s11,A]	<0.050	-	<0.050	<0.050
Dichloropropene, cis-1,3-	µg/g	[s11,A]	<0.030	-	<0.030	<0.030
Dichloropropene, trans-1,3-	µg/g	[s11,A]	<0.040	-	<0.040	<0.040
Ethylbenzene	µg/g	0.05[A]	<0.020	-	<0.020	<0.020
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Hexane (n-Hexane)	µg/g	0.05[A]	**0.14[A]**	-	**0.052[A]**	**0.058[A]**
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/g	0.5[A]	<0.50	-	<0.50	<0.50
Methyl Isobutyl Ketone (MIBK)	µg/g	0.5[A]	<0.50	-	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Methylene Chloride (Dichloromethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Styrene	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Tetrachloroethene (PCE)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Toluene	µg/g	0.2[A]	0.047	-	0.030	0.035
Trichloroethane, 1,1,1-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Trichloroethane, 1,1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Trichloroethene (TCE)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Trichlorofluoromethane (Freon 11)	µg/g	0.25[A]	<0.050	-	<0.050	<0.050
Vinyl Chloride	µg/g	0.02[A]	<0.020	-	<0.020	<0.020
Xylene, m & p-	µg/g	[s1,A]	0.11	-	0.036	0.033
Xylene, o-	µg/g	[s1,A]	0.039	-	<0.020	<0.020
Xylenes, Total	µg/g	0.05[s1,A]	**0.15[A]**	-	0.036	0.033

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
[A]	Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
[s1]	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
[s2]	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
[s3]	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
[s7]	Standard is applicable to PHC in the F1 range minus BTEX.
[s8]	Standard is applicable to PHC in the F3 range, minus PAHs (other than naphthalene). If PAHs were not analyzed, the standard is applied to F3.
[s10]	If baseline is not reached during F4 analysis, then gravimetric analysis is to be performed, and the standard is applied to the higher of the two results.
[s11]	Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
[s15]	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.

Table E-2
Summary of Groundwater Analytical Results - 403 Richmond Road, Ottawa, ON
Phase II ESA and Preliminary Geotechnical Assessment
A.L. Tubman

Sample Location			MW17-1		MW17-2			MW17-3		
Sample Date			17-Feb-17	28-Feb-17	16-Feb-17	28-Feb-17	28-Feb-17	17-Feb-17	28-Feb-17	28-Feb-17
Sample ID			MW17-1	MW 17-1	MW17-2	MW 17-2	MW 17-2 Lab-Dup	MW17-3	MW 17-3	MW 17-3 Lab-Dup
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B733261	B740499	B733261	B740499	B740499	B733261	B740499	B740499
Laboratory Sample ID			DXT570	DZC368	DXT571	DZC369	DZC369	DXT572	DZC370	DZC370
Sample Type	Units	Ontario SCS					Lab Replicate			Lab Replicate
Petroleum Hydrocarbons										
PHC F1 (C6-C10 range)	µg/L	$_{s7}$[A]	<25	-	<25	-	-	<25	-	-
PHC F1 (C6-C10 range) minus BTEX	µg/L	420$_{s7}$[A]	<25	-	<25	-	-	<25	<25	-
PHC F2 (>C10-C16 range)	µg/L	150$_{s15}$[A]	<100	-	<100	<100	<100	<100	-	-
PHC F3 (>C16-C34 range)	µg/L	500$_{s8}$[A]	<200	-	**1200[A]**	<200	<200	<200	-	-
PHC F4 (>C34-C50 range)	µg/L	500$_{s10}$[A]	<200	-	270	<200	<200	<200	-	-
Chromatogram to baseline at C50	none	n/v	YES	-	YES	YES	YES	YES	-	-
Metals										
Antimony	µg/L	1.5[A]	-	0.61	-	0.56	-	-	<0.50	-
Arsenic	µg/L	13[A]	-	<1.0	-	<1.0	-	-	<1.0	-
Barium	µg/L	610[A]	-	110	-	65	-	-	51	-
Beryllium	µg/L	0.5[A]	-	<0.50	-	<0.50	-	-	<0.50	-
Boron	µg/L	1700[A]	-	240	-	130	-	-	50	-
Cadmium	µg/L	0.5[A]	-	0.10	-	<0.10	-	-	<0.10	-
Chromium	µg/L	11[A]	-	<5.0	-	<5.0	-	-	<5.0	-
Chromium (Hexavalent)	µg/L	25[A]	-	<0.50	-	<0.50	-	-	<0.50	<0.50
Cobalt	µg/L	3.8[A]	-	0.92	-	<0.50	-	-	<0.50	-
Copper	µg/L	5[A]	-	1.3	-	1.9	-	-	1.1	-
Lead	µg/L	1.9[A]	-	<0.50	-	<0.50	-	-	<0.50	-
Mercury	µg/L	0.1[A]	-	<0.1	-	<0.1	-	-	<0.1	-
Molybdenum	µg/L	23[A]	-	3.5	-	0.66	-	-	<0.50	-
Nickel	µg/L	14[A]	-	9.2	-	2.3	-	-	2.5	-
Selenium	µg/L	5[A]	-	<2.0	-	2.2	-	-	<2.0	-
Silver	µg/L	0.3[A]	-	<0.10	-	<0.10	-	-	<0.10	-
Sodium	µg/L	490000[A]	-	320000	-	**580000[A]**	-	-	180000	-
Thallium	µg/L	0.5[A]	-	0.13	-	0.10	-	-	0.073	-
Uranium	µg/L	8.9[A]	-	1.8	-	0.94	-	-	0.97	-
Vanadium	µg/L	3.9[A]	-	<0.50	-	<1.0	-	-	<0.50	-
Zinc	µg/L	160[A]	-	<5.0	-	<5.0	-	-	<5.0	-
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	µg/L	4.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Acenaphthylene	µg/L	1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Anthracene	µg/L	0.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(a)anthracene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(a)pyrene	µg/L	0.01[A]	-	**0.030[A]**	-	<0.010	<0.010	-	<0.010	-
Benzo(b/j)fluoranthene	µg/L	0.1$_{s2}$[A]	-	0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(g,h,i)perylene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(k)fluoranthene	µg/L	0.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Chrysene	µg/L	0.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Dibenzo(a,h)anthracene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Fluoranthene	µg/L	0.4[A]	-	0.070	-	<0.050	<0.050	-	<0.050	-
Fluorene	µg/L	120[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Indeno(1,2,3-cd)pyrene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Methylnaphthalene (Total)	µg/L	2$_{s3}$[A]	-	<0.071	-	<0.071	-	-	<0.071	-
Methylnaphthalene, 1-	µg/L	$_{s3}$[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Methylnaphthalene, 2-	µg/L	$_{s3}$[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Naphthalene	µg/L	7[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Phenanthrene	µg/L	0.1[A]	-	0.040	-	<0.030	<0.030	-	<0.030	-
Pyrene	µg/L	0.2[A]	-	0.080	-	<0.050	<0.050	-	<0.050	-
Volatile Organic Compounds										
Acetone	µg/L	2700[A]	12	-	<10	-	-	<10	-	-
Benzene	µg/L	0.5[A]	0.15	-	<0.10	-	-	**0.89[A]**	-	-
Bromodichloromethane	µg/L	2[A]	0.80	-	<0.10	-	-	1.1	-	-
Bromoform (Tribromomethane)	µg/L	5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Bromomethane (Methyl bromide)	µg/L	0.89[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Carbon Tetrachloride (Tetrachloromethane)	µg/L	0.2[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Chlorobenzene (Monochlorobenzene)	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Chloroform (Trichloromethane)	µg/L	2[A]	**7.3[A]**	-	<0.10	-	-	**7.2[A]**	-	-
Dibromochloromethane	µg/L	2[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorobenzene, 1,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorobenzene, 1,3-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorobenzene, 1,4-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorodifluoromethane (Freon 12)	µg/L	590[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Dichloroethane, 1,1-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloroethane, 1,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichloroethene, 1,1-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloroethene, cis-1,2-	µg/L	1.6[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloroethene, trans-1,2-	µg/L	1.6[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloropropane, 1,2-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/L	0.5$_{s11}$[A]	<0.28	-	<0.28	-	-	<0.28	-	-
Dichloropropene, cis-1,3-	µg/L	$_{s11}$[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichloropropene, trans-1,3-	µg/L	$_{s11}$[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Ethylbenzene	µg/L	0.5[A]	<0.10	-	<0.10	-	-	0.10	-	-
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.2[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Hexane (n-Hexane)	µg/L	5[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/L	400[A]	<5.0	-	<5.0	-	-	<5.0	-	-
Methyl Isobutyl Ketone (MIBK)	µg/L	640[A]	<5.0	-	<5.0	-	-	<5.0	-	-
Methyl tert-butyl ether (MTBE)	µg/L	15[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Methylene Chloride (Dichloromethane)	µg/L	5[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Styrene	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Tetrachloroethane, 1,1,1,2-	µg/L	1.1[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Tetrachloroethane, 1,1,2,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Tetrachloroethene (PCE)	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Toluene	µg/L	0.8[A]	<0.20	-	<0.20	-	-	**0.87[A]**	-	-
Trichloroethane, 1,1,1-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Trichloroethane, 1,1,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Trichloroethene (TCE)	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Trichlorofluoromethane (Freon 11)	µg/L	150[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Vinyl Chloride	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Xylene, m & p-	µg/L	$_{s1}$[A]	0.18	-	<0.10	-	-	0.43	-	-
Xylene, o-	µg/L	$_{s1}$[A]	<0.10	-	<0.10	-	-	0.20	-	-
Xylenes, Total	µg/L	72$_{s1}$[A]	0.18	-	<0.10	-	-	0.63	-	-

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act (MOE, 2011)
[A]	Table 1 - All Types of Property Uses
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s2	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
s3	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s7	Standard is applicable to PHC in the F1 range minus BTEX.
s8	Standard is applicable to PHC in the F3 range, minus PAHs (other than naphthalene). If PAHs were not analyzed, the standard is applied to F3.
s10	If baseline is not reached during F4 analysis, then gravimetric analysis is to be performed, and the standard is applied to the higher of the two results.
s11	Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
s15	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.

Table E-1
Summary of Soil Analytical Results - 403 Richmond Road, Ottawa, ON
Phase II ESA and Preliminary Geotechnical Assessment
A.L. Tubman

Sample Location			MW17-1		MW17-2	MW17-3
Sample Date			9-Feb-17	9-Feb-17	9-Feb-17	9-Feb-17
Sample ID			MW17-1 GS1	MW17-1 GS1 Lab-Dup	MW17-2 GS1	MW17-3 GS1
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B728506	B728506	B728506	B728506
Laboratory Sample ID			DWX387	DWX387	DWX388	DWX389
Sample Type	Units	Ontario SCS		Lab Replicate		
General Chemistry						
Available (CaCl2) pH	S.U.	n/v	10.5	-	-	-
Moisture Content	%	n/v	7.5	-	11	9.4
Physical Properties						
Grain Size	%	n/v	FINE	-	-	-
Sieve - #200 (<0.075mm)	%	n/v	54	-	-	-
Sieve - #200 (>0.075mm)	%	n/v	46	-	-	-
Petroleum Hydrocarbons						
PHC F1 (C6-C10 range)	µg/g	$_{s7}$[A]	<10	-	<10	<10
PHC F1 (C6-C10 range) minus BTEX	µg/g	25_{s7}[A]	<10	-	<10	<10
PHC F2 (>C10-C16 range)	µg/g	10_{s15}[A]	<10	-	<10	<10
PHC F3 (>C16-C34 range)	µg/g	240_{s8}[A]	95	-	110	130
PHC F4 (>C34-C50 range)	µg/g	120_{s10}[A]	**200**[A]	-	**190**[A]	120
PHC F4 (>C34) Gravimetric	µg/g	120_{s10}[A]	**1200**[A]	-	**1100**[A]	**530**[A]
Chromatogram to baseline at C50	none	n/v	NO	-	NO	NO
Metals						
Antimony	µg/g	1.3[A]	0.90	-	1.6	0.64
Arsenic	µg/g	18[A]	1.6	-	4.4	2.4
Barium	µg/g	220[A]	130	-	140	160
Beryllium	µg/g	2.5[A]	0.29	-	0.42	0.33
Boron	µg/g	36[A]	11	-	12	7.3
Boron (Available)	µg/g	n/v	0.52	-	0.50	0.37
Cadmium	µg/g	1.2[A]	0.23	-	0.20	0.19
Chromium	µg/g	70[A]	14	-	19	18
Chromium (Hexavalent)	µg/g	0.66[A]	<0.2	-	<0.2	<0.2
Cobalt	µg/g	21[A]	3.8	-	6.1	5.5
Copper	µg/g	92[A]	11	-	36	19
Lead	µg/g	120[A]	84	-	89	**140**[A]
Mercury	µg/g	0.27[A]	0.091	-	0.080	0.067
Molybdenum	µg/g	2[A]	<0.50	-	0.85	0.72
Nickel	µg/g	82[A]	8.8	-	15	12
Selenium	µg/g	1.5[A]	<0.50	-	<0.50	<0.50
Silver	µg/g	0.5[A]	<0.20	-	<0.20	<0.20
Thallium	µg/g	1[A]	0.16	-	0.28	0.21
Uranium	µg/g	2.5[A]	0.38	-	0.41	0.49
Vanadium	µg/g	86[A]	13	-	17	19
Zinc	µg/g	290[A]	69	-	100	77
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	µg/g	0.072[A]	<0.050	<0.050	**0.12**[A]	**0.44**[A]
Acenaphthylene	µg/g	0.093[A]	0.066	0.076	0.091	**0.18**[A]
Anthracene	µg/g	0.16[A]	0.12	0.14	**0.35**[A]	**1.4**[A]
Benzo(a)anthracene	µg/g	0.36[A]	0.36	**0.41**[A]	**1.1**[A]	**2.9**[A]
Benzo(a)pyrene	µg/g	0.3[A]	**0.42**[A]	**0.48**[A]	**1.1**[A]	**2.5**[A]
Benzo(b/j)fluoranthene	µg/g	0.47_{s2}[A]	**0.57**[A]	**0.63**[A]	**1.5**[A]	**3.3**[A]
Benzo(g,h,i)perylene	µg/g	0.68[A]	0.33	0.37	**0.73**[A]	**1.5**[A]
Benzo(k)fluoranthene	µg/g	0.48[A]	0.19	0.23	**0.55**[A]	**1.2**[A]
Chrysene	µg/g	2.8[A]	0.34	0.38	0.95	2.4
Dibenzo(a,h)anthracene	µg/g	0.1[A]	0.073	0.079	**0.19**[A]	**0.40**[A]
Fluoranthene	µg/g	0.56[A]	**0.67**[A]	**0.78**[A]	**2.3**[A]	**6.8**[A]
Fluorene	µg/g	0.12[A]	<0.050	<0.050	0.12	**0.67**[A]
Indeno(1,2,3-cd)pyrene	µg/g	0.23[A]	**0.35**[A]	**0.39**[A]	**0.83**[A]	**1.7**[A]
Methylnaphthalene (Total)	µg/g	0.59_{s3}[A]	<0.071	-	<0.071	0.31
Methylnaphthalene, 1-	µg/g	$_{s3}$[A]	<0.050	<0.050	<0.050	0.13
Methylnaphthalene, 2-	µg/g	$_{s3}$[A]	<0.050	<0.050	<0.050	0.19
Naphthalene	µg/g	0.09[A]	0.051	<0.050	<0.050	**0.21**[A]
Phenanthrene	µg/g	0.69[A]	0.42	0.46	**1.4**[A]	**5.2**[A]
Pyrene	µg/g	1[A]	0.56	0.65	**1.9**[A]	**5.2**[A]

See notes on last page

Table E-1
Summary of Soil Analytical Results - 403 Richmond Road, Ottawa, ON
Phase II ESA and Preliminary Geotechnical Assessment
A.L. Tubman

Sample Location			MW17-1		MW17-2	MW17-3
Sample Date			9-Feb-17	9-Feb-17	9-Feb-17	9-Feb-17
Sample ID			MW17-1 GS1	MW17-1 GS1 Lab-Dup	MW17-2 GS1	MW17-3 GS1
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B728506	B728506	B728506	B728506
Laboratory Sample ID			DWX387	DWX387	DWX388	DWX389
Sample Type	Units	Ontario SCS		Lab Replicate		
Volatile Organic Compounds						
Acetone	µg/g	0.5[A]	<0.50	-	<0.50	<0.50
Benzene	µg/g	0.02[A]	<0.020	-	<0.020	<0.020
Bromodichloromethane	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Bromoform (Tribromomethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Bromomethane (Methyl bromide)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Carbon Tetrachloride (Tetrachloromethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Chlorobenzene (Monochlorobenzene)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Chloroform (Trichloromethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dibromochloromethane	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorobenzene, 1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorobenzene, 1,3-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorobenzene, 1,4-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichlorodifluoromethane (Freon 12)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethane, 1,1-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethane, 1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethene, 1,1-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethene, cis-1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloroethene, trans-1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloropropane, 1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/g	0.05[s11,A]	<0.050	-	<0.050	<0.050
Dichloropropene, cis-1,3-	µg/g	[s11,A]	<0.030	-	<0.030	<0.030
Dichloropropene, trans-1,3-	µg/g	[s11,A]	<0.040	-	<0.040	<0.040
Ethylbenzene	µg/g	0.05[A]	<0.020	-	<0.020	<0.020
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Hexane (n-Hexane)	µg/g	0.05[A]	**0.14[A]**	-	**0.052[A]**	**0.058[A]**
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/g	0.5[A]	<0.50	-	<0.50	<0.50
Methyl Isobutyl Ketone (MIBK)	µg/g	0.5[A]	<0.50	-	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Methylene Chloride (Dichloromethane)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Styrene	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Tetrachloroethene (PCE)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Toluene	µg/g	0.2[A]	0.047	-	0.030	0.035
Trichloroethane, 1,1,1-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Trichloroethane, 1,1,2-	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Trichloroethene (TCE)	µg/g	0.05[A]	<0.050	-	<0.050	<0.050
Trichlorofluoromethane (Freon 11)	µg/g	0.25[A]	<0.050	-	<0.050	<0.050
Vinyl Chloride	µg/g	0.02[A]	<0.020	-	<0.020	<0.020
Xylene, m & p-	µg/g	[s1,A]	0.11	-	0.036	0.033
Xylene, o-	µg/g	[s1,A]	0.039	-	<0.020	<0.020
Xylenes, Total	µg/g	0.05[s1,A]	**0.15[A]**	-	0.036	0.033

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
[A]	Table 1 - Residential / Parkland / Institutional / Industrial / Commercial / Community Property Use
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
[s1]	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
[s2]	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
[s3]	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
[s7]	Standard is applicable to PHC in the F1 range minus BTEX.
[s8]	Standard is applicable to PHC in the F3 range, minus PAHs (other than naphthalene). If PAHs were not analyzed, the standard is applied to F3.
[s10]	If baseline is not reached during F4 analysis, then gravimetric analysis is to be performed, and the standard is applied to the higher of the two results.
[s11]	Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
[s15]	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.

Table E-2
Summary of Groundwater Analytical Results - 403 Richmond Road, Ottawa, ON
Phase II ESA and Preliminary Geotechnical Assessment
A.L. Tubman

Sample Location			MW17-1		MW17-2			MW17-3		
Sample Date			17-Feb-17	28-Feb-17	16-Feb-17	28-Feb-17	28-Feb-17	17-Feb-17	28-Feb-17	28-Feb-17
Sample ID			MW17-1	MW 17-1	MW17-2	MW 17-2	MW 17-2 Lab-Dup	MW17-3	MW 17-3	MW 17-3 Lab-Dup
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B733261	B740499	B733261	B740499	B740499	B733261	B740499	B740499
Laboratory Sample ID			DXT570	DZC368	DXT571	DZC369	DZC369	DXT572	DZC370	DZC370
Sample Type	Units	Ontario SCS					Lab Replicate			Lab Replicate
Petroleum Hydrocarbons										
PHC F1 (C6-C10 range)	µg/L	$_{s7}$[A]	<25	-	<25	-	-	<25	-	-
PHC F1 (C6-C10 range) minus BTEX	µg/L	420$_{s7}$[A]	<25	-	<25	-	-	<25	<25	-
PHC F2 (>C10-C16 range)	µg/L	150$_{s15}$[A]	<100	-	<100	<100	<100	<100	-	-
PHC F3 (>C16-C34 range)	µg/L	500$_{s8}$[A]	<200	-	**1200**[A]	<200	<200	<200	-	-
PHC F4 (>C34-C50 range)	µg/L	500$_{s10}$[A]	<200	-	270	<200	<200	<200	-	-
Chromatogram to baseline at C50	none	n/v	YES	-	YES	YES	YES	YES	-	-
Metals										
Antimony	µg/L	1.5[A]	-	0.61	-	0.56	-	-	<0.50	-
Arsenic	µg/L	13[A]	-	<1.0	-	<1.0	-	-	<1.0	-
Barium	µg/L	610[A]	-	110	-	65	-	-	51	-
Beryllium	µg/L	0.5[A]	-	<0.50	-	<0.50	-	-	<0.50	-
Boron	µg/L	1700[A]	-	240	-	130	-	-	50	-
Cadmium	µg/L	0.5[A]	-	0.10	-	<0.10	-	-	<0.10	-
Chromium	µg/L	11[A]	-	<5.0	-	<5.0	-	-	<5.0	-
Chromium (Hexavalent)	µg/L	25[A]	-	<0.50	-	<0.50	-	-	<0.50	<0.50
Cobalt	µg/L	3.8[A]	-	0.92	-	<0.50	-	-	<0.50	-
Copper	µg/L	5[A]	-	1.3	-	1.9	-	-	1.1	-
Lead	µg/L	1.9[A]	-	<0.50	-	<0.50	-	-	<0.50	-
Mercury	µg/L	0.1[A]	-	<0.1	-	<0.1	-	-	<0.1	-
Molybdenum	µg/L	23[A]	-	3.5	-	0.66	-	-	<0.50	-
Nickel	µg/L	14[A]	-	9.2	-	2.3	-	-	2.5	-
Selenium	µg/L	5[A]	-	<2.0	-	2.2	-	-	<2.0	-
Silver	µg/L	0.3[A]	-	<0.10	-	<0.10	-	-	<0.10	-
Sodium	µg/L	490000[A]	-	320000	-	**580000**[A]	-	-	180000	-
Thallium	µg/L	0.5[A]	-	0.13	-	0.10	-	-	0.073	-
Uranium	µg/L	8.9[A]	-	1.8	-	0.94	-	-	0.97	-
Vanadium	µg/L	3.9[A]	-	<0.50	-	<1.0	-	-	<0.50	-
Zinc	µg/L	160[A]	-	<5.0	-	<5.0	-	-	<5.0	-
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	µg/L	4.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Acenaphthylene	µg/L	1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Anthracene	µg/L	0.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(a)anthracene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(a)pyrene	µg/L	0.01[A]	-	**0.030**[A]	-	<0.010	<0.010	-	<0.010	-
Benzo(b/j)fluoranthene	µg/L	0.1$_{s2}$[A]	-	0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(g,h,i)perylene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Benzo(k)fluoranthene	µg/L	0.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Chrysene	µg/L	0.1[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Dibenzo(a,h)anthracene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Fluoranthene	µg/L	0.4[A]	-	0.070	-	<0.050	<0.050	-	<0.050	-
Fluorene	µg/L	120[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Indeno(1,2,3-cd)pyrene	µg/L	0.2[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Methylnaphthalene (Total)	µg/L	2$_{s3}$[A]	-	<0.071	-	<0.071	-	-	<0.071	-
Methylnaphthalene, 1-	µg/L	$_{s3}$[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Methylnaphthalene, 2-	µg/L	$_{s3}$[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Naphthalene	µg/L	7[A]	-	<0.050	-	<0.050	<0.050	-	<0.050	-
Phenanthrene	µg/L	0.1[A]	-	0.040	-	<0.030	<0.030	-	<0.030	-
Pyrene	µg/L	0.2[A]	-	0.080	-	<0.050	<0.050	-	<0.050	-
Volatile Organic Compounds										
Acetone	µg/L	2700[A]	12	-	<10	-	-	<10	-	-
Benzene	µg/L	0.5[A]	0.15	-	<0.10	-	-	**0.89**[A]	-	-
Bromodichloromethane	µg/L	2[A]	0.80	-	<0.10	-	-	1.1	-	-
Bromoform (Tribromomethane)	µg/L	5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Bromomethane (Methyl bromide)	µg/L	0.89[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Carbon Tetrachloride (Tetrachloromethane)	µg/L	0.2[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Chlorobenzene (Monochlorobenzene)	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Chloroform (Trichloromethane)	µg/L	2[A]	**7.3**[A]	-	<0.10	-	-	**7.2**[A]	-	-
Dibromochloromethane	µg/L	2[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorobenzene, 1,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorobenzene, 1,3-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorobenzene, 1,4-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichlorodifluoromethane (Freon 12)	µg/L	590[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Dichloroethane, 1,1-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloroethane, 1,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichloroethene, 1,1-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloroethene, cis-1,2-	µg/L	1.6[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloroethene, trans-1,2-	µg/L	1.6[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloropropane, 1,2-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/L	0.5$_{s11}$[A]	<0.28	-	<0.28	-	-	<0.28	-	-
Dichloropropene, cis-1,3-	µg/L	$_{s11}$[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Dichloropropene, trans-1,3-	µg/L	$_{s11}$[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Ethylbenzene	µg/L	0.5[A]	<0.10	-	<0.10	-	-	0.10	-	-
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.2[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Hexane (n-Hexane)	µg/L	5[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/L	400[A]	<5.0	-	<5.0	-	-	<5.0	-	-
Methyl Isobutyl Ketone (MIBK)	µg/L	640[A]	<5.0	-	<5.0	-	-	<5.0	-	-
Methyl tert-butyl ether (MTBE)	µg/L	15[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Methylene Chloride (Dichloromethane)	µg/L	5[A]	<0.50	-	<0.50	-	-	<0.50	-	-
Styrene	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Tetrachloroethane, 1,1,1,2-	µg/L	1.1[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Tetrachloroethane, 1,1,2,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Tetrachloroethene (PCE)	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Toluene	µg/L	0.8[A]	<0.20	-	<0.20	-	-	**0.87**[A]	-	-
Trichloroethane, 1,1,1-	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Trichloroethane, 1,1,2-	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Trichloroethene (TCE)	µg/L	0.5[A]	<0.10	-	<0.10	-	-	<0.10	-	-
Trichlorofluoromethane (Freon 11)	µg/L	150[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Vinyl Chloride	µg/L	0.5[A]	<0.20	-	<0.20	-	-	<0.20	-	-
Xylene, m & p-	µg/L	$_{s1}$[A]	0.18	-	<0.10	-	-	0.43	-	-
Xylene, o-	µg/L	$_{s1}$[A]	<0.10	-	<0.10	-	-	0.20	-	-
Xylenes, Total	µg/L	72$_{s1}$[A]	0.18	-	<0.10	-	-	0.63	-	-

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
[A]	Table 1 - All Types of Property Uses
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s2	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
s3	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s7	Standard is applicable to PHC in the F1 range minus BTEX.
s8	Standard is applicable to PHC in the F3 range, minus PAHs (other than naphthalene). If PAHs were not analyzed, the standard is applied to F3.
s10	If baseline is not reached during F4 analysis, then gravimetric analysis is to be performed, and the standard is applied to the higher of the two results.
s11	Standard is applicable to 1,3-Dichloropropene, and the individual isomers (cis + trans) should be added for comparison.
s15	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.

APPENDIX 1

SAMPLING AND ANALYSIS PLAN

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Paterson Group Inc.

Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

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patersongroup

Sampling & Analysis Plan

Phase II Environmental Site Assessment
389 Roosevelt Avenue and 403 Richmond Road
Ottawa, Ontario

Prepared For

Starwood Group

April 2018 – March 2022

Report: PE4744-SAP

TABLE OF CONTENTS

1.0 SAMPLING PROGRAM

Paterson Group Inc. (Paterson) was commissioned by Mr. Bruce Greenberg of Starwood Group Inc. to conduct a Phase II Environmental Site Assessment (ESA) for the Phase II ESA Property addressed 3890 Roosevelt Avenue and 403 Richmond Road, Ottawa, Ontario.

The Phase II ESA was carried out to address the APECs identified on the Phase I Property. The initial subsurface program was completed by Stantec in 2017, which consisted of placing three (3) boreholes on the southern portion of the Phase I Property.

A supplemental groundwater sampling program was to be carried out by Paterson to re-assess the potential contaminants of concern on April 4, 2018, September 17 and 24, 2019, and on March 23, 2022. A summary of the sampling events is provided in the Table below.

Groundwater Samples Submitted and Analyzed Parameters							
Sample ID	**Screened Interval (m)**	**Parameters Analyzed**					**Rationale**
		BTEX	**PHCs (F1-F4)**	**VOCs**	**PAHs**	**Metals[a]**	
April 4, 2018 (Paterson)							
MW17-1	1.42-4.42m Bedrock	X	X	X			Confirm that the existing groundwater conditions for the analyzed parameters remain in compliance from the previous sampling event.
September 13, 2019 (Paterson)							
MW17-1-GW1	1.42-4.42m Bedrock				X		Re-assess the groundwater conditions regarding exceedances identified in the previous sampling event.
MW17-2-GW1[e]	1.42-4.42m Bedrock				X	X	
MW17-3-GW1	1.42-4.42m Bedrock	X		X			
September 24, 2019 (Paterson)							
MW17-1-GW2	1.42-4.42m Bedrock				X		Re-assess the groundwater conditions regarding exceedances identified in the previous sampling event.

Groundwater Samples Submitted and Analyzed Parameters

Sample ID	Screened Interval (m)	Parameters Analyzed					Rationale
		BTEX	PHCs (F1-F4)	VOCs	PAHs	Metals[a]	
March 23, 2022 (Paterson)							
MW17-1-GW	1.42-4.42m Bedrock				X		Re-assess the groundwater conditions regarding exceedances identified in the previous sampling event.
MW17-2-GW	1.42-4.42m Bedrock		X				Confirm that the existing groundwater conditions for the analyzed parameters remain in compliance from the previous sampling event.
MW17-3-GW	1.42-4.42m Bedrock	X					

[a] Metals analysis includes Hexavalent Chromium (CRVI) and Mercury (Hg)
[b] PHCs (F2-F4) only
[c] PHC, F1 only
[d] CrVI, only
[e] Sodium, only

2.0 ANALYTICAL TESTING PROGRAM

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

- ❒ At least one sample from each borehole should be submitted, in order to delineate the horizontal extent of contamination across the site.
- ❒ At least one sample from each stratigraphic unit should be submitted, in order to delineate the vertical extent of contamination at the site.
- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MECP's site condition standards.
- ❒ In boreholes with evidence of contamination as described above, a sample should be submitted from the stratigraphic unit below the 'worst-case' sample to determine whether the contaminant(s) have migrated downward.
- ❒ Parameters analyzed should be consistent with the Contaminants of Potential Concern identified in the Phase I ESA.

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

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

3.0 STANDARD OPERATING PROCEDURES

3.1 Environmental Drilling Procedure

Purpose

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

Equipment

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

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

Determining Borehole Locations

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

After drilling is completed a plan with the borehole locations must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Elevations were surveyed at geodetic elevations by Paterson personnel.

Drilling Procedure

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

- ❒ Continuous split spoon samples (every 0.6 m or 2') or semi-continuous (every 0.76 m or 2'6") are required.
- ❒ Make sure samples are well sealed in plastic bags with no holes prior to screening and are kept cool but unfrozen.
- ❒ If sampling for VOCs, BTEX, or PHCs F1, a soil core from each soil sample which may be analyzed must be taken and placed in the laboratory-provided methanol vial.
- ❒ Note all and any odours or discolouration of samples.
- ❒ Split spoon samplers must be washed between samples.
- ❒ If obvious contamination is encountered, continue sampling until vertical extent of contamination is delineated.
- ❒ As a general rule, environmental boreholes should be deep enough to intercept the groundwater table (unless this is impossible/impractical - call project manager to discuss).
- ❒ If at all possible, soil samples should be submitted to a preliminary screening procedure on site, either using a RKI Eagle, PID, etc. depending on type of suspected contamination.

Spoon Washing Procedure

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

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

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

Screening Procedure

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

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

- ❒ Samples should be brought to room temperature; this is specifically important in colder weather. Soil must not be frozen.
- ❒ Turn instrument on and allow to come to zero - calibrate if necessary
- ❒ If using RKI Eagle, ensure instrument is in methane elimination mode unless otherwise directed.
- ❒ Ensure measurement units are ppm (parts per million) initially. RKI Eagle will automatically switch to %LEL (lower explosive limit) if higher concentrations are encountered.
- ❒ Break up large lumps of soil in the sample bag, taking care not to puncture bag.
- ❒ Insert probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in bag while observing instrument readings.
- ❒ Record the highest value obtained in the first 15 to 25 seconds
- ❒ Make sure to indicate scale (ppm or LEL); also note which instrument was used (RKI Eagle 1 or 2, or MiniRae).
- ❒ Jar samples and refrigerate as per Sampling and Analysis Plan.

3.2 Monitoring Well Installation Procedure

Equipment

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

Procedure

- ❒ Drill borehole to required depth, using drilling and sampling procedures described above.
- ❒ If borehole is deeper than required monitoring well, backfill with bentonite chips to required depth. This should only be done on wells where contamination is not suspected, in order to prevent downward migration of contamination.
- ❒ Only one monitoring well should be installed per borehole.
- ❒ Monitoring wells should not be screened across more than one stratigraphic unit to prevent potential migration of contaminants between units.
- ❒ Where LNAPLs are the suspected contaminants of concern, monitoring wells should be screened straddling the water table in order to capture any free product floating on top of the water table.
- ❒ Thread the end cap onto a section of screen. Thread second section of screen if required. Thread risers onto screen. Lower into borehole to required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials entering well.
- ❒ As drillers remove augers, backfill borehole annulus with silica sand until the level of sand is approximately 0.3 m above the top of the screen.
- ❒ Backfill with holeplug until at least 0.3 m of holeplug is present above the top of the silica sand.
- ❒ Backfill remainder of borehole with holeplug or with auger cuttings (if contamination is not suspected).
- ❒ Install flushmount casing. Seal space between flushmount and borehole annulus with concrete, cold patch, or holeplug to match surrounding ground surface.

3.3 Monitoring Well Sampling Procedure

Equipment

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

Sampling Procedure

- ❒ Locate well and use socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to existing ground surface, using water level meter or interface probe. If using interface probe on suspected NAPL site, measure the thickness of free product.
- ❒ Measure total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate volume of standing water within well and record.
- ❒ Insert polyethylene tubing into well and attach to peristaltic pump. Turn on peristaltic pump and purge into graduated bucket. Purge at least three well volumes of water from the well. Measure and record field chemistry. Continue to purge, measuring field chemistry after every well volume purged, until appearance or field chemistry stabilizes.
- ❒ Note appearance of purge water, including colour, opacity (clear, cloudy, silty), sheen, presence of LNAPL, and odour. Note any other unusual features (particulate matter, effervescence (bubbling) of dissolved gas, etc.).
- ❒ Fill required sample bottles. If sampling for metals, attach 75-micron filter to discharge tube and filter metals sample. If sampling for VOCs, use low flow rate to ensure continuous stream of non-turbulent flow into sample bottles. Ensure no headspace is present in VOC vials.
- ❒ Replace well cap and flushmount casing cap.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

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

- ❒ All non-dedicated sampling equipment (split spoons) will be decontaminated according to the SOPs listed above.
- ❒ All groundwater sampling equipment is dedicated (polyethylene and flexible peristaltic tubing is replaced for each well).
- ❒ Where groundwater samples are to be analyzed for VOCs, one laboratory-provided trip blank will be submitted for analysis with every laboratory submission.
- ❒ Approximately one (1) field duplicate will be submitted for every ten (10) samples submitted for laboratory analysis. A minimum of one (1) field duplicate per project will be submitted. Field duplicates will be submitted for soil and groundwater samples
- ❒ Where combo pens are used to measure field chemistry, they will be calibrated on an approximately monthly basis, according to frequency of use.

5.0 DATA QUALITY OBJECTIVES

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

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

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

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

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

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

These considerations are discussed in the body of the report.

Monitoring Well: MW17-1

Project:	Phase II ESA and Geotechnical Assessment	**Drilling method:**	Solid Stem Auger / HQ Core
Client:	A. L. Tubman Ltd.	**Date started/completed:**	09-Feb-2017
Location:	403 Richmond Road, Ottawa, ON	**Ground surface elevation:**	99.53 m RTD
Number:	122170005.200	**Top of casing elevation:**	99.39 m RTD
Field investigator:	R. Lee	**Easting:**	440745
Contractor:	George Downing Estate Drilling Ltd.	**Northing:**	5026659

SUBSURFACE PROFILE				SAMPLE DETAILS								INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	RQD	Fractures per 1.52m	N Value	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV ● Comb 200 400 600 800	Diagram	Description
			Ground Surface	99.53										
			100 mm ASPHALT	0.00										
			FILL: light to dark brown, silty sand, some gravel	99.43 0.10										
			Light to dark brown, SILTY SAND (possible fill)	99.23 0.30	1	GS	n/a	n/a	n/a	n/a	Metals, PAH, pH, PHC F1-F4, VOC	<5		Flushmount protective cover with concrete seal
2														Backfilled with bentonite
					2	SS	50%	n/a	n/a	60		<5		50 mm ID schedule 40 PVC pipe
	1			98.56										
4			Fair quality, light grey LIMESTONE - Iron oxidation in fractures	0.97										
6				97.70	B1	CORE	100%	34" 59%	2.5	n/a				
	2		Fair quality, interlayered grey LIMESTONE and dark grey SHALE	1.83										
8														
														Backfilled with silica sand
10	3													50 mm ID slotted schedule 40 PVC pipe
				96.18										
12			Fair quality, light grey LIMESTONE to SHALEY LIMESTONE	3.35	B2	CORE	100%	40.5" 52%	2.5	n/a				Groundwater Level: 3.48 m BGS 17-Feb-17
	4													
14				95.11										
			End of Borehole	4.42										
16	5													

Screen Interval: 1.37 - 4.42 m BGS
Sand Pack Interval: 0.61 - 4.42 m BGS
Well Seal Interval: 0.23 - 0.61 m BGS

Notes:
m BGS - metres below ground surface
SS - split-spoon sample
GS - grab sample
ppm - parts per million by volume
n/a - not available

CORE - HQ core size
PAH - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

Easting and Northing coordinates based on UTM 17T projection

Drawn By/Checked By: M. Ford / R. Lee

Monitoring Well: MW17-2

Project:	Phase II ESA and Geotechnical Assessment	**Drilling method:**	Solid Stem Auger / HQ Core
Client:	A. L. Tubman Ltd.	**Date started/completed:**	09-Feb-2017
Location:	403 Richmond Road, Ottawa, ON	**Ground surface elevation:**	99.26 m RTD
Number:	122170005.200	**Top of casing elevation:**	99.16 m RTD
Field investigator:	R. Lee	**Easting:**	440744
Contractor:	George Downing Estate Drilling Ltd.	**Northing:**	5026703

SUBSURFACE PROFILE				SAMPLE DETAILS								INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	RQD	Fractures per 1.52m	N Value	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV ● Comb 200 400 600 800	Diagram	Description
			Ground Surface	99.26										
			ASPHALT	0.00										
			FILL: dark brown, clayey sand to sandy clay, with gravel	99.16 / 0.10										
			Dark brown, SILTY SAND, with some clay (possible fill)	98.95 / 0.30	1	GS	n/a	n/a	n/a	n/a	Metals, PAH, PHC F1-F4, VOC	1%		Flushmount protective cover with concrete seal
2														Backfilled with bentonite
	1			98.19	2	SS	50%	n/a	n/a	60		1%		50 mm ID schedule 40 PVC pipe
4			Good quality, light grey LIMESTONE with SHALE laminations	1.07										
			- Iron oxidation in fractures											
6					B1	CORE	100%	46.5" 78%	2.5	n/a				
	2													
8														
				96.51										
			Poor quality, dark grey interlayered SHALE and LIMESTONE	2.74										Backfilled with silica sand
10	3													50 mm ID slotted schedule 40 PVC pipe
					B2	CORE	100%	43.5" 63%	2.5	n/a				
12				95.55										
			Fair quality, grey LIMESTONE to SHALEY LIMESTONE	3.70										Groundwater Level: 3.70 m BGS 17-Feb-17
	4													
14				94.84										
			End of Borehole	4.42										
16	5													

Screen Interval: 1.37 - 4.42 m BGS
Sand Pack Interval: 0.61 - 4.42 m BGS
Well Seal Interval: 0.23 - 0.61 m BGS

Notes:
m BGS - metres below ground surface
SS - split-spoon sample
GS - grab sample
ppm - parts per million by volume
n/a - not available

CORE - HQ core size
PAH - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

Easting and Northing coordinates based on UTM 17T projection

Stantec

Drawn By/Checked By: M. Ford / R. Lee

Monitoring Well: MW17-3

Project:	Phase II ESA and Geotechnical Assessment	**Drilling method:**	Solid Stem Auger / HQ Core
Client:	A. L. Tubman Ltd.	**Date started/completed:**	09-Feb-2017
Location:	403 Richmond Road, Ottawa, ON	**Ground surface elevation:**	99.27 m RTD
Number:	122170005.200	**Top of casing elevation:**	99.19 m RTD
Field investigator:	R. Lee	**Easting:**	440729
Contractor:	George Downing Estate Drilling Ltd.	**Northing:**	5026693

SUBSURFACE PROFILE				SAMPLE DETAILS								INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m RTD) Depth (m BGS)	Sample Number	Sample Type	Recovery	RQD	Fractures per 1.52m	N Value	Lab Analyses	%LEL Comb▲ 20 40 60 80 / ppm OTOV ● Comb 200 400 600 800	Diagram	Description
			Ground Surface	99.27										
			100 mm ASPHALT	0.00										Flushmount protective cover with concrete seal
			FILL: dark brown, clayey sand, with gravel	99.17 / 0.10 / 98.97										Backfilled with bentonite
			Dark brown, SILTY SAND, with some clay (possible fill)	0.30	1	GS	n/a	n/a	n/a	n/a	Metals, PAH, PHC F1-F4, VOC	<5		50 mm ID schedule 40 PVC pipe
2					2	SS	50%	n/a	n/a	50 / 0.1 m		<5		
	1			98.21										
4			Poor quality, light grey LIMESTONE	1.07										
			- Highly fractured and highly weathered zone between 1.4 to 1.6 mBGS		B1	CORE	100%	10" 20%	10	n/a				
6	2		- Highly fractured and highly weathered zone between 2.1 to 2.3 m BGS	96.99										
			Good quality, dark grey interlayered LIMESTONE and SHALE	2.29	B2	CORE	100%	18" 75%	5	n/a				Backfilled with silica sand
8														
10	3													50 mm ID slotted schedule 40 PVC pipe
				95.92										Groundwater Level: 3.16 m BGS 17-Feb-17
			Good quality, light grey SHALEY LIMETONE to LIMESTONE	3.35										
12					B3	CORE	100%	46" 80%	5	n/a				
	4													
14				94.85										
			End of Borehole	4.42										
16	5													

Screen Interval: 1.37 - 4.42 m BGS
Sand Pack Interval: 0.61 - 4.42 m BGS
Well Seal Interval: 0.23 - 0.61 m BGS

Notes:
m BGS - metres below ground surface
SS - split-spoon sample
GS - grab sample
ppm - parts per million by volume
n/a - not available

CORE - HQ core size
PAH - polycyclic aromatic hydrocarbons
PHC F1-F4 - petroleum hydrocarbon fractions 1 to 4
VOC - volatile organic compounds

Easting and Northing coordinates based on UTM 17T projection

Drawn By/Checked By: M. Ford / R. Lee

SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

The standard terminology to describe the relative strength of cohesionless soils is the compactness condition, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

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

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity, S_t, is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

ROCK DESCRIPTION

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

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

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

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

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

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

CONSOLIDATION TEST

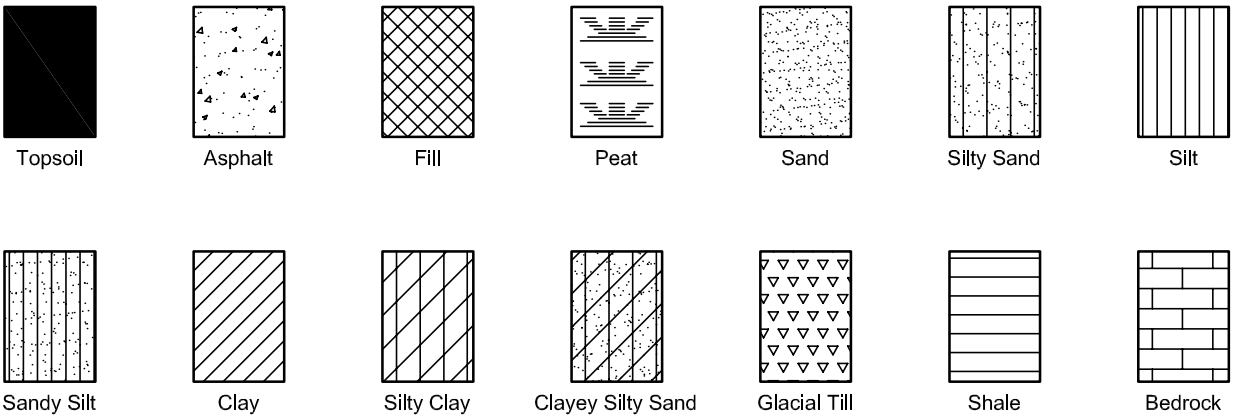
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

PERMEABILITY TEST

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

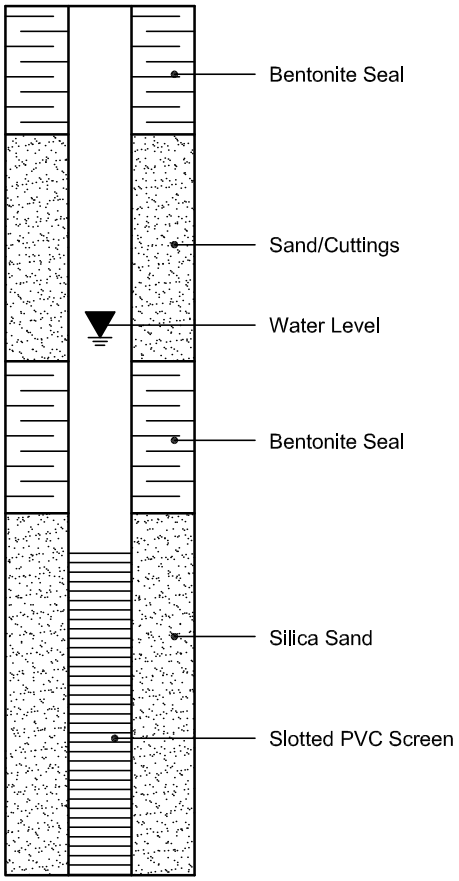
SYMBOLS AND TERMS (continued)

STRATA PLOT

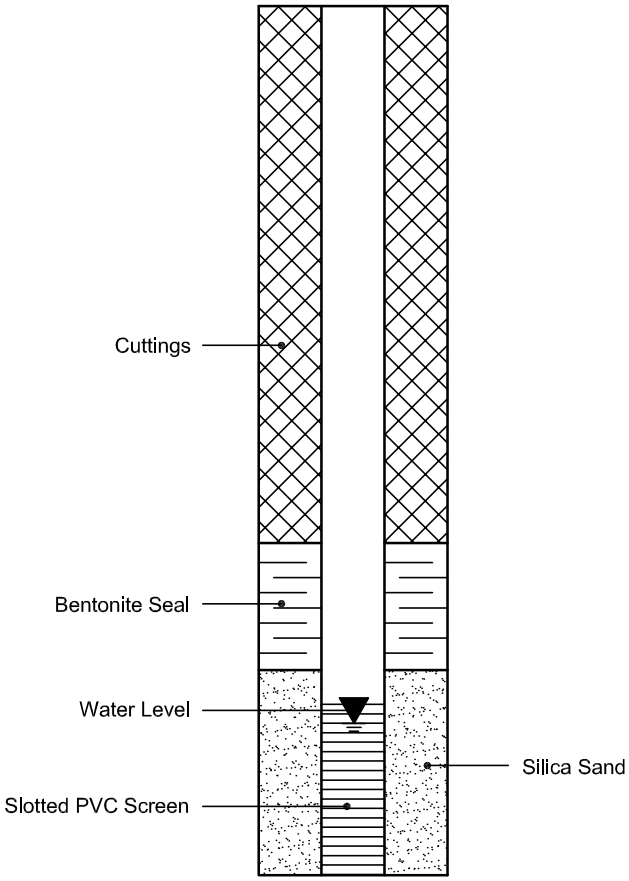


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



6.0 PHYSICAL IMPEDIMENTS TO SAMPLING & ANALYSIS PLAN

Physical impediments to the Sampling and Analysis plan may include:

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

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

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 23724
Project: PE4046
Custody: 116598

Report Date: 10-Apr-2018
Order Date: 6-Apr-2018

Order #: 1814460

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

Paracel ID	Client ID
1814460-01	MW17-1

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23724

Report Date: 10-Apr-2018
Order Date: 6-Apr-2018
Project Description: PE4046

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	6-Apr-18	6-Apr-18
PHC F1	CWS Tier 1 - P&T GC-FID	6-Apr-18	6-Apr-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	9-Apr-18	9-Apr-18

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23724

Report Date: 10-Apr-2018

Order Date: 6-Apr-2018

Project Description: PE4046

	Client ID:	MW17-1	-	-	-
	Sample Date:	04/05/2018 09:00	-	-	-
	Sample ID:	1814460-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
Toluene-d8	Surrogate	108%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23724

Report Date: 10-Apr-2018
Order Date: 6-Apr-2018
Project Description: PE4046

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						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*83.1*		*ug/L*		*104*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23724

Report Date: 10-Apr-2018
Order Date: 6-Apr-2018
Project Description: PE4046

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	
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Toluene	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: Toluene-d8	*84.8*		*ug/L*		*106*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23724

Report Date: 10-Apr-2018
Order Date: 6-Apr-2018
Project Description: PE4046

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2060	25	ug/L		103	68-117			
F2 PHCs (C10-C16)	1750	100	ug/L		97.3	60-140			
F3 PHCs (C16-C34)	3130	100	ug/L		84.0	60-140			
F4 PHCs (C34-C50)	2360	100	ug/L		95.4	60-140			
Volatiles									
Benzene	33.0	0.5	ug/L		82.6	60-130			
Ethylbenzene	38.4	0.5	ug/L		95.9	60-130			
Toluene	33.0	0.5	ug/L		82.5	60-130			
m,p-Xylenes	76.0	0.5	ug/L		95.0	60-130			
o-Xylene	37.7	0.5	ug/L		94.2	60-130			
Surrogate: Toluene-d8	*79.5*		*ug/L*		*99.4*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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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Paracel ID: 1814460

Chain of Custody (Lab Use Only)
№ 116598

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE4046	**Turnaround Time:**	
Contact Name: Mark D'Arcy	Quote #	☐ 1 Day	☐ 3 Day
Address: 154 Colonnade Rd. S Ottawa	PO # 23724	☐ 2 Day	☒ Regular
Telephone: 613-226-7381	Email Address: mdarcy@patersongroup.ca	Date Required:	

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

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

Paracel Order Number: 1814460

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	MW17-1	GW		3	Apr 3/18		✓												
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Should read april 5th as per arc. DDOM april 6, 18

Comments: ⊳ :- Sample date on PHC + a VOC's read = APR 05, 2018.

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: T. Keane	Received at Lab: Sudeepora Doumai	Verified By: [signature]
Relinquished By (Print):	Date/Time: 06/04/18 10:00	Date/Time: APR 06, 2018 11:46	Date/Time: Apr 6/18 12:37
Date/Time:	Temperature: °C AH	Temperature: 16.1 °C	pH Verified [ ] By: N/A

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 23724
Project: PE4046
Custody: 116598

Report Date: 16-Sep-2019
Order Date: 6-Apr-2018

Revised Report **Order #: 1814460**

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

Paracel ID	Client ID
1814460-01	MW17-1

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23724

Report Date: 16-Sep-2019
Order Date: 6-Apr-2018
Project Description: PE4046

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	6-Apr-18	6-Apr-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	9-Apr-18	9-Apr-18
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	6-Apr-18	6-Apr-18

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23724

Report Date: 16-Sep-2019

Order Date: 6-Apr-2018

Project Description: PE4046

Client ID:		MW17-1	-	-	-
Sample Date:		05-Apr-18 09:00	-	-	-
Sample ID:		1814460-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethan	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23724

Report Date: 16-Sep-2019

Order Date: 6-Apr-2018

Project Description: PE4046

	Client ID:	MW17-1	-	-	-
	Sample Date:	05-Apr-18 09:00	-	-	-
	Sample ID:	1814460-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
4-Bromofluorobenzene	Surrogate	105%	-	-	-
Dibromofluoromethane	Surrogate	114%	-	-	-
Toluene-d8	Surrogate	108%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

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						
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*90.8*		*ug/L*		*113*	*50-140*			
Surrogate: Dibromofluoromethane	*83.4*		*ug/L*		*104*	*50-140*			
Surrogate: Toluene-d8	*83.1*		*ug/L*		*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
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	
Chloroform	1.84	0.5	ug/L	1.83			0.5	30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	2.08	0.5	ug/L	2.03			2.4	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*88.9*		*ug/L*		*111*	*50-140*			
Surrogate: Dibromofluoromethane	*78.1*		*ug/L*		*97.6*	*50-140*			
Surrogate: Toluene-d8	*84.8*		*ug/L*		*106*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2060	25	ug/L		103	68-117			
F2 PHCs (C10-C16)	1750	100	ug/L		97.3	60-140			
F3 PHCs (C16-C34)	3130	100	ug/L		84.0	60-140			
F4 PHCs (C34-C50)	2360	100	ug/L		95.4	60-140			
Volatiles									
Acetone	86.4	5.0	ug/L		86.4	50-140			
Benzene	33.0	0.5	ug/L		82.6	60-130			
Bromodichloromethane	33.4	0.5	ug/L		83.4	60-130			
Bromoform	34.2	0.5	ug/L		85.6	60-130			
Bromomethane	30.0	0.5	ug/L		75.0	50-140			
Carbon Tetrachloride	32.6	0.2	ug/L		81.5	60-130			
Chlorobenzene	33.0	0.5	ug/L		82.6	60-130			
Chloroform	32.0	0.5	ug/L		80.1	60-130			
Dibromochloromethane	34.6	0.5	ug/L		86.6	60-130			
Dichlorodifluoromethane	25.0	1.0	ug/L		62.4	50-140			
1,2-Dichlorobenzene	35.5	0.5	ug/L		88.7	60-130			
1,3-Dichlorobenzene	36.2	0.5	ug/L		90.6	60-130			
1,4-Dichlorobenzene	34.2	0.5	ug/L		85.4	60-130			
1,1-Dichloroethane	30.2	0.5	ug/L		75.5	60-130			
1,2-Dichloroethane	31.4	0.5	ug/L		78.5	60-130			
1,1-Dichloroethylene	33.0	0.5	ug/L		82.6	60-130			
cis-1,2-Dichloroethylene	30.3	0.5	ug/L		75.6	60-130			
trans-1,2-Dichloroethylene	35.6	0.5	ug/L		89.0	60-130			
1,2-Dichloropropane	32.8	0.5	ug/L		82.1	60-130			
cis-1,3-Dichloropropylene	30.8	0.5	ug/L		77.0	60-130			
trans-1,3-Dichloropropylene	36.7	0.5	ug/L		91.8	60-130			
Ethylbenzene	38.4	0.5	ug/L		95.9	60-130			
Ethylene dibromide (dibromoethane	33.2	0.2	ug/L		83.1	60-130			
Hexane	32.9	1.0	ug/L		82.3	60-130			
Methyl Ethyl Ketone (2-Butanone)	80.9	5.0	ug/L		80.9	50-140			
Methyl Isobutyl Ketone	90.8	5.0	ug/L		90.8	50-140			
Methyl tert-butyl ether	83.0	2.0	ug/L		83.0	50-140			
Methylene Chloride	32.5	5.0	ug/L		81.3	60-130			
Styrene	36.2	0.5	ug/L		90.6	60-130			
1,1,1,2-Tetrachloroethane	35.8	0.5	ug/L		89.4	60-130			
1,1,2,2-Tetrachloroethane	33.9	0.5	ug/L		84.8	60-130			
Tetrachloroethylene	34.4	0.5	ug/L		86.1	60-130			
Toluene	33.0	0.5	ug/L		82.5	60-130			
1,1,1-Trichloroethane	33.1	0.5	ug/L		82.7	60-130			
1,1,2-Trichloroethane	33.6	0.5	ug/L		84.1	60-130			
Trichloroethylene	31.7	0.5	ug/L		79.2	60-130			
Trichlorofluoromethane	33.5	1.0	ug/L		83.6	60-130			
Vinyl chloride	28.9	0.5	ug/L		72.3	50-140			
m,p-Xylenes	76.0	0.5	ug/L		95.0	60-130			
o-Xylene	37.7	0.5	ug/L		94.2	60-130			
Surrogate: 4-Bromofluorobenzene	*84.5*		*ug/L*		*106*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 This report includes additional data for VOCs per client.

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.
- When reported, data for F4G has been processed using a silica gel cleanup.

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Paracel ID: 1814460

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№ 116598

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE4046	Turnaround Time:	
Contact Name: Mark D'Arcy	Quote #	☐ 1 Day	☐ 3 Day
Address: 154 Colonnade Rd. S Ottawa	PO # 23724	☐ 2 Day	☑ Regular
Telephone: 613-226-7381	Email Address: mdarcy@patersongroup.ca	Date Required:	

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

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

Paracel Order Number: 1814460

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	MW17-1	GW		3	Apr 3/18		✓													
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Should read april 5th as per arc. [illegible] april 6, 18

Comments: ① : Sample date on PHC + & VOC'S read = APR 05, 2018.

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: Sunderpern Doumai	Verified By: [signature]
Relinquished By (Print):	Date/Time: 06/04/18 10:00	Date/Time: APR 06, 2018 11:46	Date/Time: Apr 6/18 12:27
Date/Time:	Temperature: °C AH	Temperature: 6.1 °C	pH Verified [ ] By: N/A

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 27115
Project: PE4744
Custody: 123214

Report Date: 17-Sep-2019
Order Date: 13-Sep-2019

Order #: 1937606

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

Paracel ID	Client ID
1937606-01	MW17-2-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27115

Report Date: 17-Sep-2019
Order Date: 13-Sep-2019
Project Description: PE4744

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 200.8 - ICP-MS	16-Sep-19	17-Sep-19

Sample and QC Qualifiers Notes

1- 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.

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27115

Report Date: 17-Sep-2019
Order Date: 13-Sep-2019
Project Description: PE4744

Sample Results

Sodium

Matrix: Water
Sample Date: 12-Sep-19

Paracel ID	Client ID	Units	MDL	Result
1937606-01	MW17-2-GW1	ug/L	200	416000

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Sodium	**ND**	**200**	**ug/L**						
Matrix Duplicate									
Sodium	**1310**	**200**	**ug/L**	**28700**			**183.0**	**20**	**QR-01**
Matrix Spike									
Sodium	9590		ug/L		95.9	80-120			

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Paracel ID: 1937606

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Chain of Custody (Lab Use Only) № 123214

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE 4744		**Turnaround Time:**
Contact Name: Mark D'Arcy	Quote #		☐ 1 Day ☐ 3 Day
Address: 154 Colonnade Rd, Nepean, On	PO # 27115		☐ 2 Day ☑ Regular
Telephone: 613-226-7381	Email Address: mdarcy@patersongroup.ca		Date Required:

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

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

Paracel Order Number: 1937606

Required Analyses

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Sodium						
1	MW17-2-GW1	GW		1	Sep 12/19	12:00PM								✓						
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Parcel

Relinquished By (Sign): [signature]	Received by Driver/Depot: M. Dcouse	Received at Lab: Juneeporn Dehmai	Verified By: [signature]
Relinquished By (Print): Nicholas Doucette	Date/Time: 14/09/19 12:30 PM	Date/Time: SEP 13, 2019 01:20	Date/Time: 09/13/19 15:59
Date/Time:	Temperature: 13	Temperature: 10.8 °C	pH Verified ✓ By: RJ

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 27503
Project: PE4744
Custody: 123253

Report Date: 27-Sep-2019
Order Date: 25-Sep-2019

Order #: 1939395

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

Paracel ID	Client ID
1939395-01	MW17-1-GW2

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27503

Report Date: 27-Sep-2019
Order Date: 25-Sep-2019
Project Description: PE4744

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	27-Sep-19	27-Sep-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27503

Report Date: 27-Sep-2019

Order Date: 25-Sep-2019

Project Description: PE4744

	Client ID:	MW17-1-GW2	-	-	-
	Sample Date:	24-Sep-19 10:15	-	-	-
	Sample ID:	1939395-01	-	-	-
	MDL/Units	Water	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	0.04	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	0.02	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	<0.01	-	-	-
2-Fluorobiphenyl	Surrogate	96.7%	-	-	-
Terphenyl-d14	Surrogate	92.3%	-	-	-

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						
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	*19.0*		*ug/L*		*95.2*	*50-140*			
Surrogate: Terphenyl-d14	*23.4*		*ug/L*		*117*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Semi-Volatiles									
Acenaphthene	4.90	0.05	ug/L		98.1	50-140			
Acenaphthylene	3.82	0.05	ug/L		76.4	50-140			
Anthracene	4.40	0.01	ug/L		88.1	50-140			
Benzo [a] anthracene	5.03	0.01	ug/L		101	50-140			
Benzo [a] pyrene	4.07	0.01	ug/L		81.4	50-140			
Benzo [b] fluoranthene	5.23	0.05	ug/L		105	50-140			
Benzo [g,h,i] perylene	3.88	0.05	ug/L		77.5	50-140			
Benzo [k] fluoranthene	4.86	0.05	ug/L		97.2	50-140			
Chrysene	5.74	0.05	ug/L		115	50-140			
Dibenzo [a,h] anthracene	3.89	0.05	ug/L		77.8	50-140			
Fluoranthene	4.39	0.01	ug/L		87.8	50-140			
Fluorene	5.14	0.05	ug/L		103	50-140			
Indeno [1,2,3-cd] pyrene	3.96	0.05	ug/L		79.2	50-140			
1-Methylnaphthalene	4.44	0.05	ug/L		88.9	50-140			
2-Methylnaphthalene	4.77	0.05	ug/L		95.3	50-140			
Naphthalene	5.00	0.05	ug/L		99.9	50-140			
Phenanthrene	4.18	0.05	ug/L		83.6	50-140			
Pyrene	4.86	0.01	ug/L		97.2	50-140			
Surrogate: 2-Fluorobiphenyl	*22.9*		*ug/L*		*114*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

Paracel ID: 1939395

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Chain of Custody (Lab Use Only)

№ 123253

Page 1 of 1

Client Name: Paterson Group	Project Reference: PE 4744		**Turnaround Time:**
Contact Name: Mark D'Arcy	Quote #		☐ 1 Day ☐ 3 Day
Address: 154 Colonnade Rd, Nepean, On	PO # 27503		☑ 2 Day ☐ Regular
Telephone: 613-226-7381	Email Address: mdarcy@patersongroup.ca		Date Required:

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

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

Paracel Order Number: 1938395

Required Analyses

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	MW17-1-GW2	GW		1	Sept 24/19	10:15 AM			✓											
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: Suneeporn Dokmai	Verified By: [signature]
Relinquished By (Print): Nicholas Doucette	Date/Time: 25/09/19 3:40	Date/Time: Sep 25, 2019 04.41	Date/Time: 09/25/19 18:14
Date/Time:	Temperature: °C	Temperature: 19.8 °C	pH Verified [ ] By: NA

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 27118
Project: PE4744
Custody: 123217

Report Date: 20-Sep-2019
Order Date: 16-Sep-2019

Order #: 1938121

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

Paracel ID	Client ID
1938121-01	MW17-1
1938121-02	MW17-3

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27118

Report Date: 20-Sep-2019
Order Date: 16-Sep-2019
Project Description: PE4744

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	19-Sep-19	20-Sep-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	18-Sep-19	19-Sep-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27118

Report Date: 20-Sep-2019

Order Date: 16-Sep-2019

Project Description: PE4744

	Client ID:	MW17-1	MW17-3	-	-
	Sample Date:	13-Sep-19 09:00	13-Sep-19 09:00	-	-
	Sample ID:	1938121-01	1938121-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	-	<5.0	-	-
Benzene	0.5 ug/L	-	<0.5	-	-
Bromodichloromethane	0.5 ug/L	-	<0.5	-	-
Bromoform	0.5 ug/L	-	<0.5	-	-
Bromomethane	0.5 ug/L	-	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	-	<0.2	-	-
Chlorobenzene	0.5 ug/L	-	<0.5	-	-
Chloroform	0.5 ug/L	-	<0.5	-	-
Dibromochloromethane	0.5 ug/L	-	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	-	<1.0	-	-
1,2-Dichlorobenzene	0.5 ug/L	-	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	-	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	-	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	-	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	-	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	-	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	-	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	-	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	-	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	-	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	-	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	-	<0.5	-	-
Ethylbenzene	0.5 ug/L	-	<0.5	-	-
Ethylene dibromide (dibromoethan	0.2 ug/L	-	<0.2	-	-
Hexane	1.0 ug/L	-	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	-	<5.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	-	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	-	<2.0	-	-
Methylene Chloride	5.0 ug/L	-	<5.0	-	-
Styrene	0.5 ug/L	-	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	-	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	-	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	-	<0.5	-	-
Toluene	0.5 ug/L	-	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	-	<0.5	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27118

Report Date: 20-Sep-2019
Order Date: 16-Sep-2019
Project Description: PE4744

	Client ID:	MW17-1	MW17-3	-	-
	Sample Date:	13-Sep-19 09:00	13-Sep-19 09:00	-	-
	Sample ID:	1938121-01	1938121-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2-Trichloroethane	0.5 ug/L	-	<0.5	-	-
Trichloroethylene	0.5 ug/L	-	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	-	<1.0	-	-
Vinyl chloride	0.5 ug/L	-	<0.5	-	-
m,p-Xylenes	0.5 ug/L	-	<0.5	-	-
o-Xylene	0.5 ug/L	-	<0.5	-	-
Xylenes, total	0.5 ug/L	-	<0.5	-	-
4-Bromofluorobenzene	Surrogate	-	93.6%	-	-
Dibromofluoromethane	Surrogate	-	110%	-	-
Toluene-d8	Surrogate	-	98.8%	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	1.19	-	-	-
Anthracene	0.01 ug/L	0.52	-	-	-
Benzo [a] anthracene	0.01 ug/L	1.65	-	-	-
Benzo [a] pyrene	0.01 ug/L	2.74	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	3.74	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	2.47	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	1.91	-	-	-
Chrysene	0.05 ug/L	1.64	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	0.65	-	-	-
Fluoranthene	0.01 ug/L	2.01	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	2.38	-	-	-
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	0.33	-	-	-
Pyrene	0.01 ug/L	2.31	-	-	-
2-Fluorobiphenyl	Surrogate	76.5%	-	-	-
Terphenyl-d14	Surrogate	121%	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27118

Report Date: 20-Sep-2019
Order Date: 16-Sep-2019
Project Description: PE4744

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*77.4*		*ug/L*		*96.8*	*50-140*			
Surrogate: Dibromofluoromethane	*85.5*		*ug/L*		*107*	*50-140*			
Surrogate: Toluene-d8	*79.4*		*ug/L*		*99.3*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	4.45	0.5	ug/L	4.42			0.7	30	
cis-1,2-Dichloroethylene	152	0.5	ug/L	154			1.3	30	
trans-1,2-Dichloroethylene	2.32	0.5	ug/L	2.11			9.5	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	
Ethylene dibromide (dibromoethane	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	11.7	0.5	ug/L	11.6			0.9	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	3460	0.5	ug/L	3660			5.6	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*75.7*		*ug/L*		*94.6*	*50-140*			
Surrogate: Dibromofluoromethane	*81.6*		*ug/L*		*102*	*50-140*			
Surrogate: Toluene-d8	*78.2*		*ug/L*		*97.7*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	133	5.0	ug/L		133	50-140			
Benzene	39.9	0.5	ug/L		99.8	60-130			
Bromodichloromethane	38.1	0.5	ug/L		95.3	60-130			
Bromoform	38.8	0.5	ug/L		96.9	60-130			
Bromomethane	48.5	0.5	ug/L		121	50-140			
Carbon Tetrachloride	41.1	0.2	ug/L		103	60-130			
Chlorobenzene	36.6	0.5	ug/L		91.6	60-130			
Chloroform	43.4	0.5	ug/L		108	60-130			
Dibromochloromethane	34.8	0.5	ug/L		87.0	60-130			
Dichlorodifluoromethane	43.3	1.0	ug/L		108	50-140			
1,2-Dichlorobenzene	31.7	0.5	ug/L		79.2	60-130			
1,3-Dichlorobenzene	31.0	0.5	ug/L		77.4	60-130			
1,4-Dichlorobenzene	32.3	0.5	ug/L		80.8	60-130			
1,1-Dichloroethane	44.8	0.5	ug/L		112	60-130			
1,2-Dichloroethane	36.1	0.5	ug/L		90.3	60-130			
1,1-Dichloroethylene	47.4	0.5	ug/L		119	60-130			
cis-1,2-Dichloroethylene	38.7	0.5	ug/L		96.8	60-130			
trans-1,2-Dichloroethylene	41.9	0.5	ug/L		105	60-130			
1,2-Dichloropropane	37.8	0.5	ug/L		94.5	60-130			
cis-1,3-Dichloropropylene	36.3	0.5	ug/L		90.8	60-130			
trans-1,3-Dichloropropylene	39.8	0.5	ug/L		99.5	60-130			
Ethylbenzene	34.9	0.5	ug/L		87.2	60-130			
Ethylene dibromide (dibromoethane	34.2	0.2	ug/L		85.4	60-130			
Hexane	31.6	1.0	ug/L		79.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	121	5.0	ug/L		121	50-140			
Methyl Isobutyl Ketone	97.3	5.0	ug/L		97.3	50-140			
Methyl tert-butyl ether	115	2.0	ug/L		115	50-140			
Methylene Chloride	40.6	5.0	ug/L		101	60-130			
Styrene	34.8	0.5	ug/L		87.0	60-130			
1,1,1,2-Tetrachloroethane	35.9	0.5	ug/L		89.7	60-130			
1,1,2,2-Tetrachloroethane	48.4	0.5	ug/L		121	60-130			
Tetrachloroethylene	35.0	0.5	ug/L		87.4	60-130			
Toluene	37.0	0.5	ug/L		92.5	60-130			
1,1,1-Trichloroethane	38.0	0.5	ug/L		95.1	60-130			
1,1,2-Trichloroethane	41.8	0.5	ug/L		104	60-130			
Trichloroethylene	34.5	0.5	ug/L		86.2	60-130			
Trichlorofluoromethane	43.2	1.0	ug/L		108	60-130			
Vinyl chloride	36.1	0.5	ug/L		90.3	50-140			
m,p-Xylenes	75.2	0.5	ug/L		94.0	60-130			
o-Xylene	37.2	0.5	ug/L		92.9	60-130			
Surrogate: 4-Bromofluorobenzene	*73.3*		*ug/L*		*91.7*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

PARACEL LABORATORIES LTD.

Paracel ID: 1938121

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

Chain of Custody (Lab Use Only)
№ 123217

Page 1 of 1

Client Name: Paterson Group		Project Reference: PE47[illegible]44	
Contact Name: Mark D'Arcy		Quote #	
Address:		PO # 27118	
Telephone: 226-7381		Email Address:	

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

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

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

Paracel Order Number: 1938121

Required Analyses

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	MW17-1	GW	-	1	Sept.13/19				✓											
2	MW17-3	GW	-	2	"	"		✓												
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments: Project Reference is PE4744.

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: M. Trouse	Received at Lab: DGama	Verified By: [signature]
Relinquished By (Print): Nicholas Doucette	Date/Time: 16/09/19 3:15 PM	Date/Time: 16 Sep 19 16:12	Date/Time: 9-6-19 1620
Date/Time:	Temperature:	Temperature: 8.6 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 27336
Project: PE4744
Custody: 63347

Report Date: 30-Mar-2022
Order Date: 24-Mar-2022

Order #: 2213503

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

Paracel ID	Client ID
2213503-01	MW17-1-GW
2213503-02	MW17-2-GW
2213503-03	MW17-3-GW

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27336

Report Date: 30-Mar-2022

Order Date: 24-Mar-2022

Project Description: PE4744

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	26-Mar-22	26-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	25-Mar-22	26-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	28-Mar-22	29-Mar-22
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	29-Mar-22	29-Mar-22

PARACEL LABORATORIES LTD.

Order #: 2213503

Certificate of Analysis

Report Date: 30-Mar-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 24-Mar-2022

Client PO: **27336**

Project Description: **PE4744**

	Client ID:	MW17-1-GW	MW17-2-GW	MW17-3-GW	-
	Sample Date:	23-Mar-22 09:00	23-Mar-22 09:00	23-Mar-22 09:00	-
	Sample ID:	2213503-01	2213503-02	2213503-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Benzene	0.5 ug/L	-	-	<0.5	-
Ethylbenzene	0.5 ug/L	-	-	<0.5	-
Toluene	0.5 ug/L	-	-	<0.5	-
m,p-Xylenes	0.5 ug/L	-	-	<0.5	-
o-Xylene	0.5 ug/L	-	-	<0.5	-
Xylenes, total	0.5 ug/L	-	-	<0.5	-
Toluene-d8	Surrogate	-	-	104%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	-	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	-	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	-	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	-	<100	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	0.02	-	-	-
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	0.42	-	-	-
2-Methylnaphthalene	0.05 ug/L	0.13	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	0.54	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	0.03	-	-	-
2-Fluorobiphenyl	Surrogate	68.1%	-	-	-
Terphenyl-d14	Surrogate	101%	-	-	-

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						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*14.9*		*ug/L*		*74.6*	*50-140*			
Surrogate: Terphenyl-d14	*15.2*		*ug/L*		*76.0*	*50-140*			
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*95.6*		*ug/L*		*119*	*50-140*			

Certificate of Analysis

Report Date: 30-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 24-Mar-2022

Client PO: 27336

Project Description: PE4744

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*91.0*		*ug/L*		*114*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1890	25	ug/L	ND	94.6	68-117			
F2 PHCs (C10-C16)	1220	100	ug/L	ND	76.1	60-140			
F3 PHCs (C16-C34)	3410	100	ug/L	ND	87.0	60-140			
F4 PHCs (C34-C50)	2550	100	ug/L	ND	103	60-140			
Semi-Volatiles									
Acenaphthene	3.58	0.05	ug/L	ND	71.7	50-140			
Acenaphthylene	3.11	0.05	ug/L	ND	62.2	50-140			
Anthracene	3.53	0.01	ug/L	ND	70.5	50-140			
Benzo [a] anthracene	3.50	0.01	ug/L	ND	69.9	50-140			
Benzo [a] pyrene	4.12	0.01	ug/L	ND	82.4	50-140			
Benzo [b] fluoranthene	4.19	0.05	ug/L	ND	83.7	50-140			
Benzo [g,h,i] perylene	3.93	0.05	ug/L	ND	78.5	50-140			
Benzo [k] fluoranthene	4.11	0.05	ug/L	ND	82.3	50-140			
Chrysene	4.32	0.05	ug/L	ND	86.3	50-140			
Dibenzo [a,h] anthracene	4.03	0.05	ug/L	ND	80.6	50-140			
Fluoranthene	3.69	0.01	ug/L	ND	73.7	50-140			
Fluorene	3.33	0.05	ug/L	ND	66.5	50-140			
Indeno [1,2,3-cd] pyrene	4.42	0.05	ug/L	ND	88.3	50-140			
1-Methylnaphthalene	4.78	0.05	ug/L	ND	95.6	50-140			
2-Methylnaphthalene	5.11	0.05	ug/L	ND	102	50-140			
Naphthalene	4.69	0.05	ug/L	ND	93.9	50-140			
Phenanthrene	3.75	0.05	ug/L	ND	75.0	50-140			
Pyrene	3.67	0.01	ug/L	ND	73.5	50-140			
Surrogate: 2-Fluorobiphenyl	*19.3*		*ug/L*		*96.5*	*50-140*			
Surrogate: Terphenyl-d14	*21.6*		*ug/L*		*108*	*50-140*			
Volatiles									
Benzene	36.6	0.5	ug/L	ND	91.5	60-130			
Ethylbenzene	38.1	0.5	ug/L	ND	95.3	60-130			
Toluene	40.4	0.5	ug/L	ND	101	60-130			
m,p-Xylenes	80.8	0.5	ug/L	ND	101	60-130			
o-Xylene	40.7	0.5	ug/L	ND	102	60-130			
Surrogate: Toluene-d8	*87.0*		*ug/L*		*109*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD

Paracel ID: 2213503

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2213503	№ 64437

Client Name: PATERSON	Project Ref: PE 4744	Page 1 of 1
Contact Name: Michael Beaudoin	Quote #:	Turnaround Time
Address: 154 Colonnade Rd	PO #: 27336	☐ 1 day ☐ 3 day
	E-mail: MBeaudoin@PatersonGroup.ca BDrieschner@PatersonGroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analysis: PHCs (F1-F4)	BTEX	PAHs
1	MW17-1-GW	GW	4	1	23-MAR-22				X
2	MW17-2-GW	GW	8	3	↓		X		
3	MW17-3-GW	GW	2	2	↓			X	
4									
5									
6									
7									
8									
9									
10									

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): BDrieschner	Received By Driver/Depot: T. Leane	Received at Lab:	Verified By:
Relinquished By (Print): Beau Drieschner	Date/Time: 24/03/22 4:02	Date/Time: Mar 24 2022 4:40	Date/Time: Mar 24 2022 5:40
Date/Time: 24-MAR-22	Temperature: °C PH	Temperature: 9.7 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 27336
Project: PE4744
Custody: 63347

Report Date: 30-Mar-2022
Order Date: 24-Mar-2022

Order #: 2213503

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

Paracel ID	Client ID
2213503-01	MW17-1-GW
2213503-02	MW17-2-GW
2213503-03	MW17-3-GW

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27336

Report Date: 30-Mar-2022

Order Date: 24-Mar-2022

Project Description: PE4744

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	26-Mar-22	26-Mar-22
PHC F1	CWS Tier 1 - P&T GC-FID	25-Mar-22	26-Mar-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	28-Mar-22	29-Mar-22
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	29-Mar-22	29-Mar-22

PARACEL LABORATORIES LTD.

Order #: 2213503

Certificate of Analysis

Report Date: 30-Mar-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 24-Mar-2022

Client PO: **27336**

Project Description: **PE4744**

	Client ID:	MW17-1-GW	MW17-2-GW	MW17-3-GW	-
	Sample Date:	23-Mar-22 09:00	23-Mar-22 09:00	23-Mar-22 09:00	-
	Sample ID:	2213503-01	2213503-02	2213503-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Benzene	0.5 ug/L	-	-	<0.5	-
Ethylbenzene	0.5 ug/L	-	-	<0.5	-
Toluene	0.5 ug/L	-	-	<0.5	-
m,p-Xylenes	0.5 ug/L	-	-	<0.5	-
o-Xylene	0.5 ug/L	-	-	<0.5	-
Xylenes, total	0.5 ug/L	-	-	<0.5	-
Toluene-d8	Surrogate	-	-	104%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	-	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	-	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	-	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	-	<100	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	0.02	-	-	-
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	0.42	-	-	-
2-Methylnaphthalene	0.05 ug/L	0.13	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	0.54	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	0.03	-	-	-
2-Fluorobiphenyl	Surrogate	68.1%	-	-	-
Terphenyl-d14	Surrogate	101%	-	-	-

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						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*14.9*		*ug/L*		*74.6*	*50-140*			
Surrogate: Terphenyl-d14	*15.2*		*ug/L*		*76.0*	*50-140*			
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*95.6*		*ug/L*		*119*	*50-140*			

Certificate of Analysis

Report Date: 30-Mar-2022

Client: Paterson Group Consulting Engineers

Order Date: 24-Mar-2022

Client PO: 27336

Project Description: PE4744

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*91.0*		*ug/L*		*114*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1890	25	ug/L	ND	94.6	68-117			
F2 PHCs (C10-C16)	1220	100	ug/L	ND	76.1	60-140			
F3 PHCs (C16-C34)	3410	100	ug/L	ND	87.0	60-140			
F4 PHCs (C34-C50)	2550	100	ug/L	ND	103	60-140			
Semi-Volatiles									
Acenaphthene	3.58	0.05	ug/L	ND	71.7	50-140			
Acenaphthylene	3.11	0.05	ug/L	ND	62.2	50-140			
Anthracene	3.53	0.01	ug/L	ND	70.5	50-140			
Benzo [a] anthracene	3.50	0.01	ug/L	ND	69.9	50-140			
Benzo [a] pyrene	4.12	0.01	ug/L	ND	82.4	50-140			
Benzo [b] fluoranthene	4.19	0.05	ug/L	ND	83.7	50-140			
Benzo [g,h,i] perylene	3.93	0.05	ug/L	ND	78.5	50-140			
Benzo [k] fluoranthene	4.11	0.05	ug/L	ND	82.3	50-140			
Chrysene	4.32	0.05	ug/L	ND	86.3	50-140			
Dibenzo [a,h] anthracene	4.03	0.05	ug/L	ND	80.6	50-140			
Fluoranthene	3.69	0.01	ug/L	ND	73.7	50-140			
Fluorene	3.33	0.05	ug/L	ND	66.5	50-140			
Indeno [1,2,3-cd] pyrene	4.42	0.05	ug/L	ND	88.3	50-140			
1-Methylnaphthalene	4.78	0.05	ug/L	ND	95.6	50-140			
2-Methylnaphthalene	5.11	0.05	ug/L	ND	102	50-140			
Naphthalene	4.69	0.05	ug/L	ND	93.9	50-140			
Phenanthrene	3.75	0.05	ug/L	ND	75.0	50-140			
Pyrene	3.67	0.01	ug/L	ND	73.5	50-140			
Surrogate: 2-Fluorobiphenyl	*19.3*		*ug/L*		*96.5*	*50-140*			
Surrogate: Terphenyl-d14	*21.6*		*ug/L*		*108*	*50-140*			
Volatiles									
Benzene	36.6	0.5	ug/L	ND	91.5	60-130			
Ethylbenzene	38.1	0.5	ug/L	ND	95.3	60-130			
Toluene	40.4	0.5	ug/L	ND	101	60-130			
m,p-Xylenes	80.8	0.5	ug/L	ND	101	60-130			
o-Xylene	40.7	0.5	ug/L	ND	102	60-130			
Surrogate: Toluene-d8	*87.0*		*ug/L*		*109*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD

Paracel ID: 2213503

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2213503	№ 64437

Client Name: PATERSON	Project Ref: PE 4744	Page 1 of 1
Contact Name: Michael Beaudoin	Quote #:	Turnaround Time
Address: 154 Colonnade Rd	PO #: 27336	☐ 1 day ☐ 3 day
	E-mail: MBeaudoin@PatersonGroup.ca BDrieschner@PatersonGroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analysis: PHCs (F1-F4)	BTEX	PAHs
1	MW17-1-GW	GW	4	1	23-MAR-22				X
2	MW17-2-GW	GW	8	3	↓		X		
3	MW17-3-GW	GW	2	2	↓			X	
4									
5									
6									
7									
8									
9									
10									

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): BDrieschner	Received By Driver/Depot: T. Leane	Received at Lab:	Verified By:
Relinquished By (Print): Beau Drieschner	Date/Time: 24/03/22 4:02	Date/Time: Mar 24 2022 4:40	Date/Time: Mar 24 2022 5:40
Date/Time: 24-MAR-22	Temperature: °C PH	Temperature: 9.7 °C	pH Verified: ☐ By:

Your Project #: 122170005.200
Your C.O.C. #: 597431-01-01

Attention:Allen MacGarvie

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/02/21
Report #: R4364294
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B728506
Received: 2017/02/09, 17:25

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	3	N/A	2017/02/17	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	3	2017/02/13	2017/02/13	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	3	N/A	2017/02/14		EPA 8260C m
Hexavalent Chromium in Soil by IC (1, 2)	3	2017/02/13	2017/02/14	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	3	2017/02/15	2017/02/16	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	3	2017/02/16	2017/02/16	CAM SOP-00316	CCME PHC-CWS m
Strong Acid Leachable Metals by ICPMS (1)	3	2017/02/13	2017/02/13	CAM SOP-00447	EPA 6020B m
Moisture (1)	3	N/A	2017/02/13	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	3	2017/02/15	2017/02/16	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT (1)	1	2017/02/14	2017/02/14	CAM SOP-00413	EPA 9045 D m
Sieve, 75um (1)	1	N/A	2017/02/15	CAM SOP-00467	Carter 2nd ed m
Volatile Organic Compounds and F1 PHCs (1)	3	N/A	2017/02/13	CAM SOP-00230	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 122170005.200
Your C.O.C. #: 597431-01-01

Attention:Allen MacGarvie

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/02/21
Report #: R4364294
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B728506
Received: 2017/02/09, 17:25

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

O.REG 153 METALS PACKAGE (SOIL)

Maxxam ID		DWX387	DWX388	DWX389		
Sampling Date		2017/02/09 11:30	2017/02/09 13:30	2017/02/09 14:30		
COC Number		597431-01-01	597431-01-01	597431-01-01		
	UNITS	MW17-1 GS1	MW17-2 GS1	MW17-3 GS1	RDL	QC Batch
Inorganics						
Moisture	%	7.5	11	9.4	1.0	4862252
Chromium (VI)	ug/g	<0.2	<0.2	<0.2	0.2	4861521
Metals						
Hot Water Ext. Boron (B)	ug/g	0.52	0.50	0.37	0.050	4861387
Acid Extractable Antimony (Sb)	ug/g	0.90	1.6	0.64	0.20	4861369
Acid Extractable Arsenic (As)	ug/g	1.6	4.4	2.4	1.0	4861369
Acid Extractable Barium (Ba)	ug/g	130	140	160	0.50	4861369
Acid Extractable Beryllium (Be)	ug/g	0.29	0.42	0.33	0.20	4861369
Acid Extractable Boron (B)	ug/g	11	12	7.3	5.0	4861369
Acid Extractable Cadmium (Cd)	ug/g	0.23	0.20	0.19	0.10	4861369
Acid Extractable Chromium (Cr)	ug/g	14	19	18	1.0	4861369
Acid Extractable Cobalt (Co)	ug/g	3.8	6.1	5.5	0.10	4861369
Acid Extractable Copper (Cu)	ug/g	11	36	19	0.50	4861369
Acid Extractable Lead (Pb)	ug/g	84	89	140	1.0	4861369
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.85	0.72	0.50	4861369
Acid Extractable Nickel (Ni)	ug/g	8.8	15	12	0.50	4861369
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	0.50	4861369
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	0.20	4861369
Acid Extractable Thallium (Tl)	ug/g	0.16	0.28	0.21	0.050	4861369
Acid Extractable Uranium (U)	ug/g	0.38	0.41	0.49	0.050	4861369
Acid Extractable Vanadium (V)	ug/g	13	17	19	5.0	4861369
Acid Extractable Zinc (Zn)	ug/g	69	100	77	5.0	4861369
Acid Extractable Mercury (Hg)	ug/g	0.091	0.080	0.067	0.050	4861369

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

O.REG 153 PAHS (SOIL)

Maxxam ID		DWX387	DWX387	DWX388	DWX389		
Sampling Date		2017/02/09 11:30	2017/02/09 11:30	2017/02/09 13:30	2017/02/09 14:30		
COC Number		597431-01-01	597431-01-01	597431-01-01	597431-01-01		
	UNITS	MW17-1 GS1	MW17-1 GS1 Lab-Dup	MW17-2 GS1	MW17-3 GS1	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/g	<0.071		<0.071	0.31	0.071	4859582
Polyaromatic Hydrocarbons							
Acenaphthene	ug/g	<0.050	<0.050	0.12	0.44	0.050	4864148
Acenaphthylene	ug/g	0.066	0.076	0.091	0.18	0.050	4864148
Anthracene	ug/g	0.12	0.14	0.35	1.4	0.050	4864148
Benzo(a)anthracene	ug/g	0.36	0.41	1.1	2.9	0.050	4864148
Benzo(a)pyrene	ug/g	0.42	0.48	1.1	2.5	0.050	4864148
Benzo(b/j)fluoranthene	ug/g	0.57	0.63	1.5	3.3	0.050	4864148
Benzo(g,h,i)perylene	ug/g	0.33	0.37	0.73	1.5	0.050	4864148
Benzo(k)fluoranthene	ug/g	0.19	0.23	0.55	1.2	0.050	4864148
Chrysene	ug/g	0.34	0.38	0.95	2.4	0.050	4864148
Dibenz(a,h)anthracene	ug/g	0.073	0.079	0.19	0.40	0.050	4864148
Fluoranthene	ug/g	0.67	0.78	2.3	6.8	0.050	4864148
Fluorene	ug/g	<0.050	<0.050	0.12	0.67	0.050	4864148
Indeno(1,2,3-cd)pyrene	ug/g	0.35	0.39	0.83	1.7	0.050	4864148
1-Methylnaphthalene	ug/g	<0.050	<0.050	<0.050	0.13	0.050	4864148
2-Methylnaphthalene	ug/g	<0.050	<0.050	<0.050	0.19	0.050	4864148
Naphthalene	ug/g	0.051	<0.050	<0.050	0.21	0.050	4864148
Phenanthrene	ug/g	0.42	0.46	1.4	5.2	0.050	4864148
Pyrene	ug/g	0.56	0.65	1.9	5.2	0.050	4864148
Surrogate Recovery (%)							
D10-Anthracene	%	115	119	113	101		4864148
D14-Terphenyl (FS)	%	101	101	101	97		4864148
D8-Acenaphthylene	%	94	95	94	88		4864148

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DWX387	DWX388	DWX389		
Sampling Date		2017/02/09 11:30	2017/02/09 13:30	2017/02/09 14:30		
COC Number		597431-01-01	597431-01-01	597431-01-01		
	UNITS	MW17-1 GS1	MW17-2 GS1	MW17-3 GS1	RDL	QC Batch
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	0.050	4859583
Volatile Organics						
Acetone (2-Propanone)	ug/g	<0.50	<0.50	<0.50	0.50	4861607
Benzene	ug/g	<0.020	<0.020	<0.020	0.020	4861607
Bromodichloromethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Bromoform	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Bromomethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Carbon Tetrachloride	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Chlorobenzene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Chloroform	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Dibromochloromethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,1-Dichloroethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,2-Dichloroethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,1-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,2-Dichloropropane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	0.030	4861607
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	0.040	4861607
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	0.020	4861607
Ethylene Dibromide	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Hexane	ug/g	0.14	0.052	0.058	0.050	4861607
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	<0.50	0.50	4861607
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	<0.50	0.50	4861607
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Styrene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Tetrachloroethylene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Toluene	ug/g	0.047	0.030	0.035	0.020	4861607

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DWX387	DWX388	DWX389		
Sampling Date		2017/02/09 11:30	2017/02/09 13:30	2017/02/09 14:30		
COC Number		597431-01-01	597431-01-01	597431-01-01		
	UNITS	MW17-1 GS1	MW17-2 GS1	MW17-3 GS1	RDL	QC Batch
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Trichloroethylene	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	<0.050	0.050	4861607
Vinyl Chloride	ug/g	<0.020	<0.020	<0.020	0.020	4861607
p+m-Xylene	ug/g	0.11	0.036	0.033	0.020	4861607
o-Xylene	ug/g	0.039	<0.020	<0.020	0.020	4861607
Total Xylenes	ug/g	0.15	0.036	0.033	0.020	4861607
F1 (C6-C10)	ug/g	<10	<10	<10	10	4861607
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	10	4861607
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	10	4865439
F3 (C16-C34 Hydrocarbons)	ug/g	95	110	130	50	4865439
F4 (C34-C50 Hydrocarbons)	ug/g	200	190	120	50	4865439
Reached Baseline at C50	ug/g	No	No	No		4865439
Surrogate Recovery (%)						
o-Terphenyl	%	87	85	86		4865439
4-Bromofluorobenzene	%	98	98	98		4861607
D10-o-Xylene	%	100	97	92		4861607
D4-1,2-Dichloroethane	%	103	104	104		4861607
D8-Toluene	%	94	93	93		4861607

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

RESULTS OF ANALYSES OF SOIL

Maxxam ID		DWX387		
Sampling Date		2017/02/09 11:30		
COC Number		597431-01-01		
	UNITS	**MW17-1 GS1**	**RDL**	**QC Batch**
Inorganics				
Available (CaCl2) pH	pH	10.5		4862643
Miscellaneous Parameters				
Grain Size	%	FINE	N/A	4862973
Sieve - #200 (<0.075mm)	%	54	1	4862973
Sieve - #200 (>0.075mm)	%	46	1	4862973

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		DWX387	DWX388	DWX389		
Sampling Date		2017/02/09 11:30	2017/02/09 13:30	2017/02/09 14:30		
COC Number		597431-01-01	597431-01-01	597431-01-01		
	UNITS	MW17-1 GS1	MW17-2 GS1	MW17-3 GS1	RDL	QC Batch
F2-F4 Hydrocarbons						
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	1200	1100	530	100	4866611

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

TEST SUMMARY

Maxxam ID: DWX387
Sample ID: MW17-1 GS1
Matrix: Soil

Collected: 2017/02/09
Shipped:
Received: 2017/02/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4859582	N/A	2017/02/17	Automated Statchk
Hot Water Extractable Boron	ICP	4861387	2017/02/13	2017/02/13	Jolly John
1,3-Dichloropropene Sum	CALC	4859583	N/A	2017/02/14	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4861521	2017/02/13	2017/02/14	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4865439	2017/02/15	2017/02/16	Zhiyue (Frank) Zhu
F4G (CCME Hydrocarbons Gravimetric)	BAL	4866611	2017/02/16	2017/02/16	Yeldho Mathai
Strong Acid Leachable Metals by ICPMS	ICP/MS	4861369	2017/02/13	2017/02/13	Viviana Canzonieri
Moisture	BAL	4862252	N/A	2017/02/13	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4864148	2017/02/15	2017/02/16	Mitesh Raj
pH CaCl2 EXTRACT	AT	4862643	2017/02/14	2017/02/14	Neil Dassanayake
Sieve, 75um	SIEV	4862973	N/A	2017/02/15	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4861607	N/A	2017/02/13	John Wu

Maxxam ID: DWX387 Dup
Sample ID: MW17-1 GS1
Matrix: Soil

Collected: 2017/02/09
Shipped:
Received: 2017/02/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4864148	2017/02/15	2017/02/16	Mitesh Raj

Maxxam ID: DWX388
Sample ID: MW17-2 GS1
Matrix: Soil

Collected: 2017/02/09
Shipped:
Received: 2017/02/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4859582	N/A	2017/02/17	Automated Statchk
Hot Water Extractable Boron	ICP	4861387	2017/02/13	2017/02/13	Jolly John
1,3-Dichloropropene Sum	CALC	4859583	N/A	2017/02/14	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4861521	2017/02/13	2017/02/14	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4865439	2017/02/15	2017/02/16	Zhiyue (Frank) Zhu
F4G (CCME Hydrocarbons Gravimetric)	BAL	4866611	2017/02/16	2017/02/16	Yeldho Mathai
Strong Acid Leachable Metals by ICPMS	ICP/MS	4861369	2017/02/13	2017/02/13	Viviana Canzonieri
Moisture	BAL	4862252	N/A	2017/02/13	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4864148	2017/02/15	2017/02/16	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4861607	N/A	2017/02/13	John Wu

Maxxam ID: DWX389
Sample ID: MW17-3 GS1
Matrix: Soil

Collected: 2017/02/09
Shipped:
Received: 2017/02/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4859582	N/A	2017/02/17	Automated Statchk
Hot Water Extractable Boron	ICP	4861387	2017/02/13	2017/02/13	Jolly John
1,3-Dichloropropene Sum	CALC	4859583	N/A	2017/02/14	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4861521	2017/02/13	2017/02/14	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4865439	2017/02/15	2017/02/16	Zhiyue (Frank) Zhu

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Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

TEST SUMMARY

Maxxam ID: DWX389
Sample ID: MW17-3 GS1
Matrix: Soil

Collected: 2017/02/09
Shipped:
Received: 2017/02/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
F4G (CCME Hydrocarbons Gravimetric)	BAL	4866611	2017/02/16	2017/02/16	Yeldho Mathai
Strong Acid Leachable Metals by ICPMS	ICP/MS	4861369	2017/02/13	2017/02/13	Viviana Canzonieri
Moisture	BAL	4862252	N/A	2017/02/13	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4864148	2017/02/15	2017/02/16	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4861607	N/A	2017/02/13	John Wu

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.3°C

Custody seal was not present on the cooler.
The samples were received at the laboratory on the sampling date with ice in the cooler.

Revised Report (2017/02/13): Sieve analysis has been included in this report.

Revised Report (2017/02/16): F4G analysis has been included in this report.
PAH Analysis: Due to the sample matrix, samples required dilution. Detection limits were adjusted accordingly.

Revised Report (2017/02/21): Client sample IDs changed as per client request.

Results relate only to the items tested.

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Maxxam Job #: B728506
Report Date: 2017/02/21

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4861607	4-Bromofluorobenzene	2017/02/13	106	60 - 140	106	60 - 140	97	%				
4861607	D10-o-Xylene	2017/02/13	103	60 - 130	93	60 - 130	85	%				
4861607	D4-1,2-Dichloroethane	2017/02/13	104	60 - 140	105	60 - 140	103	%				
4861607	D8-Toluene	2017/02/13	101	60 - 140	100	60 - 140	95	%				
4864148	D10-Anthracene	2017/02/15	112	50 - 130	96	50 - 130	86	%				
4864148	D14-Terphenyl (FS)	2017/02/15	88	50 - 130	80	50 - 130	82	%				
4864148	D8-Acenaphthylene	2017/02/15	97	50 - 130	94	50 - 130	80	%				
4865439	o-Terphenyl	2017/02/16	99	60 - 130	96	60 - 130	98	%				
4861369	Acid Extractable Antimony (Sb)	2017/02/13	100	75 - 125	105	80 - 120	<0.20	ug/g	NC	30		
4861369	Acid Extractable Arsenic (As)	2017/02/13	97	75 - 125	100	80 - 120	<1.0	ug/g	NC	30		
4861369	Acid Extractable Barium (Ba)	2017/02/13	99	75 - 125	103	80 - 120	<0.50	ug/g	6.1	30		
4861369	Acid Extractable Beryllium (Be)	2017/02/13	99	75 - 125	98	80 - 120	<0.20	ug/g	NC	30		
4861369	Acid Extractable Boron (B)	2017/02/13	97	75 - 125	96	80 - 120	<5.0	ug/g	NC	30		
4861369	Acid Extractable Cadmium (Cd)	2017/02/13	99	75 - 125	103	80 - 120	<0.10	ug/g	NC	30		
4861369	Acid Extractable Chromium (Cr)	2017/02/13	98	75 - 125	102	80 - 120	<1.0	ug/g	1.1	30		
4861369	Acid Extractable Cobalt (Co)	2017/02/13	96	75 - 125	102	80 - 120	<0.10	ug/g	3.5	30		
4861369	Acid Extractable Copper (Cu)	2017/02/13	96	75 - 125	97	80 - 120	<0.50	ug/g	15	30		
4861369	Acid Extractable Lead (Pb)	2017/02/13	98	75 - 125	102	80 - 120	<1.0	ug/g	NC	30		
4861369	Acid Extractable Mercury (Hg)	2017/02/13	93	75 - 125	101	80 - 120	<0.050	ug/g				
4861369	Acid Extractable Molybdenum (Mo)	2017/02/13	101	75 - 125	103	80 - 120	<0.50	ug/g	NC	30		
4861369	Acid Extractable Nickel (Ni)	2017/02/13	98	75 - 125	99	80 - 120	<0.50	ug/g	0.67	30		
4861369	Acid Extractable Selenium (Se)	2017/02/13	102	75 - 125	103	80 - 120	<0.50	ug/g	NC	30		
4861369	Acid Extractable Silver (Ag)	2017/02/13	102	75 - 125	103	80 - 120	<0.20	ug/g	NC	30		
4861369	Acid Extractable Thallium (Tl)	2017/02/13	98	75 - 125	103	80 - 120	<0.050	ug/g	NC	30		
4861369	Acid Extractable Uranium (U)	2017/02/13	97	75 - 125	101	80 - 120	<0.050	ug/g	2.9	30		
4861369	Acid Extractable Vanadium (V)	2017/02/13	NC	75 - 125	98	80 - 120	<5.0	ug/g	NC	30		
4861369	Acid Extractable Zinc (Zn)	2017/02/13	100	75 - 125	98	80 - 120	<5.0	ug/g	NC	30		
4861387	Hot Water Ext. Boron (B)	2017/02/13	103	75 - 125	102	75 - 125	<0.050	ug/g	NC	40		
4861521	Chromium (VI)	2017/02/14	0 (1)	75 - 125	82	80 - 120	<0.2	ug/g	NC	35		
4861607	1,1,1,2-Tetrachloroethane	2017/02/13	99	60 - 140	106	60 - 130	<0.050	ug/g	NC	50		
4861607	1,1,1-Trichloroethane	2017/02/13	92	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		

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Maxxam Job #: B728506
Report Date: 2017/02/21

QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4861607	1,1,2,2-Tetrachloroethane	2017/02/13	104	60 - 140	113	60 - 130	<0.050	ug/g	NC	50		
4861607	1,1,2-Trichloroethane	2017/02/13	97	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4861607	1,1-Dichloroethane	2017/02/13	91	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4861607	1,1-Dichloroethylene	2017/02/13	91	60 - 140	95	60 - 130	<0.050	ug/g	NC	50		
4861607	1,2-Dichlorobenzene	2017/02/13	96	60 - 140	104	60 - 130	<0.050	ug/g	NC	50		
4861607	1,2-Dichloroethane	2017/02/13	93	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4861607	1,2-Dichloropropane	2017/02/13	93	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4861607	1,3-Dichlorobenzene	2017/02/13	94	60 - 140	100	60 - 130	<0.050	ug/g	NC	50		
4861607	1,4-Dichlorobenzene	2017/02/13	97	60 - 140	104	60 - 130	<0.050	ug/g	NC	50		
4861607	Acetone (2-Propanone)	2017/02/13	101	60 - 140	108	60 - 140	<0.50	ug/g	NC	50		
4861607	Benzene	2017/02/13	92	60 - 140	97	60 - 130	<0.020	ug/g	NC	50		
4861607	Bromodichloromethane	2017/02/13	98	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4861607	Bromoform	2017/02/13	107	60 - 140	117	60 - 130	<0.050	ug/g	NC	50		
4861607	Bromomethane	2017/02/13	96	60 - 140	101	60 - 140	<0.050	ug/g	NC	50		
4861607	Carbon Tetrachloride	2017/02/13	93	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4861607	Chlorobenzene	2017/02/13	98	60 - 140	103	60 - 130	<0.050	ug/g	NC	50		
4861607	Chloroform	2017/02/13	93	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4861607	cis-1,2-Dichloroethylene	2017/02/13	99	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4861607	cis-1,3-Dichloropropene	2017/02/13	102	60 - 140	106	60 - 130	<0.030	ug/g	NC	50		
4861607	Dibromochloromethane	2017/02/13	102	60 - 140	111	60 - 130	<0.050	ug/g	NC	50		
4861607	Dichlorodifluoromethane (FREON 12)	2017/02/13	65	60 - 140	69	60 - 140	<0.050	ug/g	NC	50		
4861607	Ethylbenzene	2017/02/13	95	60 - 140	99	60 - 130	<0.020	ug/g	NC	50		
4861607	Ethylene Dibromide	2017/02/13	103	60 - 140	110	60 - 130	<0.050	ug/g	NC	50		
4861607	F1 (C6-C10) - BTEX	2017/02/13					<10	ug/g	NC	30		
4861607	F1 (C6-C10)	2017/02/13	94	60 - 140	91	80 - 120	<10	ug/g	NC	30		
4861607	Hexane	2017/02/13	90	60 - 140	92	60 - 130	<0.050	ug/g	NC	50		
4861607	Methyl Ethyl Ketone (2-Butanone)	2017/02/13	108	60 - 140	117	60 - 140	<0.50	ug/g	NC	50		
4861607	Methyl Isobutyl Ketone	2017/02/13	110	60 - 140	120	60 - 130	<0.50	ug/g	NC	50		
4861607	Methyl t-butyl ether (MTBE)	2017/02/13	96	60 - 140	101	60 - 130	<0.050	ug/g	NC	50		
4861607	Methylene Chloride(Dichloromethane)	2017/02/13	101	60 - 140	108	60 - 130	<0.050	ug/g	NC	50		
4861607	o-Xylene	2017/02/13	95	60 - 140	100	60 - 130	<0.020	ug/g	NC	50		

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Maxxam Job #: B728506
Report Date: 2017/02/21

QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4861607	p+m-Xylene	2017/02/13	95	60 - 140	98	60 - 130	<0.020	ug/g	NC	50		
4861607	Styrene	2017/02/13	99	60 - 140	105	60 - 130	<0.050	ug/g	NC	50		
4861607	Tetrachloroethylene	2017/02/13	93	60 - 140	98	60 - 130	<0.050	ug/g	NC	50		
4861607	Toluene	2017/02/13	89	60 - 140	93	60 - 130	<0.020	ug/g	NC	50		
4861607	Total Xylenes	2017/02/13					<0.020	ug/g	NC	50		
4861607	trans-1,2-Dichloroethylene	2017/02/13	92	60 - 140	97	60 - 130	<0.050	ug/g	NC	50		
4861607	trans-1,3-Dichloropropene	2017/02/13	106	60 - 140	109	60 - 130	<0.040	ug/g	NC	50		
4861607	Trichloroethylene	2017/02/13	94	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4861607	Trichlorofluoromethane (FREON 11)	2017/02/13	93	60 - 140	99	60 - 130	<0.050	ug/g	NC	50		
4861607	Vinyl Chloride	2017/02/13	88	60 - 140	94	60 - 130	<0.020	ug/g	NC	50		
4862252	Moisture	2017/02/13							2.1	20		
4862643	Available (CaCl2) pH	2017/02/14			99	97 - 103			0.18	N/A		
4862973	Sieve - #200 (<0.075mm)	2017/02/15							1.9	20	56	53 - 58
4862973	Sieve - #200 (>0.075mm)	2017/02/15							4.6	20	44	42 - 47
4864148	1-Methylnaphthalene	2017/02/16	134 (2)	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40		
4864148	2-Methylnaphthalene	2017/02/16	152 (2)	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40		
4864148	Acenaphthene	2017/02/16	114	50 - 130	101	50 - 130	<0.0050	ug/g	NC	40		
4864148	Acenaphthylene	2017/02/16	117	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40		
4864148	Anthracene	2017/02/16	82	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40		
4864148	Benzo(a)anthracene	2017/02/16	109	50 - 130	112	50 - 130	<0.0050	ug/g	14	40		
4864148	Benzo(a)pyrene	2017/02/16	83	50 - 130	103	50 - 130	<0.0050	ug/g	14	40		
4864148	Benzo(b/j)fluoranthene	2017/02/16	96	50 - 130	102	50 - 130	<0.0050	ug/g	11	40		
4864148	Benzo(g,h,i)perylene	2017/02/16	114	50 - 130	110	50 - 130	<0.0050	ug/g	12	40		
4864148	Benzo(k)fluoranthene	2017/02/16	89	50 - 130	111	50 - 130	<0.0050	ug/g	NC	40		
4864148	Chrysene	2017/02/16	100	50 - 130	107	50 - 130	<0.0050	ug/g	13	40		
4864148	Dibenz(a,h)anthracene	2017/02/16	108	50 - 130	106	50 - 130	<0.0050	ug/g	NC	40		
4864148	Fluoranthene	2017/02/16	91	50 - 130	104	50 - 130	<0.0050	ug/g	15	40		
4864148	Fluorene	2017/02/16	130 (2)	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40		
4864148	Indeno(1,2,3-cd)pyrene	2017/02/16	106	50 - 130	113	50 - 130	<0.0050	ug/g	12	40		
4864148	Naphthalene	2017/02/16	137 (2)	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40		
4864148	Phenanthrene	2017/02/16	76	50 - 130	104	50 - 130	<0.0050	ug/g	9.7	40		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4864148	Pyrene	2017/02/16	100	50 - 130	106	50 - 130	<0.0050	ug/g	15	40		
4865439	F2 (C10-C16 Hydrocarbons)	2017/02/16	107	50 - 130	105	80 - 120	<10	ug/g	NC	30		
4865439	F3 (C16-C34 Hydrocarbons)	2017/02/16	101	50 - 130	99	80 - 120	<50	ug/g	NC	30		
4865439	F4 (C34-C50 Hydrocarbons)	2017/02/16	99	50 - 130	95	80 - 120	<50	ug/g	NC	30		
4866611	F4G-sg (Grav. Heavy Hydrocarbons)	2017/02/16	98	65 - 135	103	65 - 135	<100	ug/g	NC	50		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The matrix spike was reanalyzed to confirm result.

(2) The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte.

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Maxxam Job #: B728506
Report Date: 2017/02/21

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: 122170005.200
Your C.O.C. #: 598659-01-01

Attention:Allen MacGarvie

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/02/27
Report #: R4371644
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B733261
Received: 2017/02/17, 11:15

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
1,3-Dichloropropene Sum (1)	3	N/A	2017/02/23		EPA 8260C m
Petroleum Hydro. CCME F1 & BTEX in Water	3	N/A	2017/02/22	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water (2)	3	2017/02/20	2017/02/21	OTT SOP-00001	CCME Hydrocarbons
Volatile Organic Compounds in Water (1)	3	N/A	2017/02/23	CAM SOP-00226	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Your Project #: 122170005.200
Your C.O.C. #: 598659-01-01

Attention:Allen MacGarvie

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/02/27
Report #: R4371644
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B733261
Received: 2017/02/17, 11:15

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B733261
Report Date: 2017/02/27

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

O.REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		DXT570		DXT571	DXT572		
Sampling Date		2017/02/17 10:00		2017/02/16 13:00	2017/02/17 09:45		
	UNITS	MW17-1	QC Batch	MW17-2	MW17-3	RDL	QC Batch
BTEX & F1 Hydrocarbons							
F1 (C6-C10)	ug/L	<25	4866183	<25	<25	25	4870106
F1 (C6-C10) - BTEX	ug/L	<25	4866183	<25	<25	25	4870106
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	<100	4869718	<100	<100	100	4869718
F3 (C16-C34 Hydrocarbons)	ug/L	<200	4869718	1200	<200	200	4869718
F4 (C34-C50 Hydrocarbons)	ug/L	<200	4869718	270	<200	200	4869718
Reached Baseline at C50	ug/L	Yes	4869718	Yes	Yes		4869718
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	110	4866183	108	107		4870106
4-Bromofluorobenzene	%	104	4866183	104	100		4870106
D10-Ethylbenzene	%	119	4866183	128	123		4870106
D4-1,2-Dichloroethane	%	113	4866183	107	110		4870106
o-Terphenyl	%	98	4869718	99	98		4869718

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B733261
Report Date: 2017/02/27

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

O.REG 153 VOLATILE ORGANICS (WATER)

Maxxam ID		DXT570	DXT571	DXT572		
Sampling Date		2017/02/17 10:00	2017/02/16 13:00	2017/02/17 09:45		
	UNITS	MW17-1	MW17-2	MW17-3	RDL	QC Batch
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/L	<0.28	<0.28	<0.28	0.28	4867689
Volatile Organics						
Acetone (2-Propanone)	ug/L	12	<10	<10	10	4870027
Benzene	ug/L	0.15	<0.10	0.89	0.10	4870027
Bromodichloromethane	ug/L	0.80	<0.10	1.1	0.10	4870027
Bromoform	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Bromomethane	ug/L	<0.50	<0.50	<0.50	0.50	4870027
Carbon Tetrachloride	ug/L	<0.10	<0.10	<0.10	0.10	4870027
Chlorobenzene	ug/L	<0.10	<0.10	<0.10	0.10	4870027
Chloroform	ug/L	7.3	<0.10	7.2	0.10	4870027
Dibromochloromethane	ug/L	<0.20	<0.20	<0.20	0.20	4870027
1,2-Dichlorobenzene	ug/L	<0.20	<0.20	<0.20	0.20	4870027
1,3-Dichlorobenzene	ug/L	<0.20	<0.20	<0.20	0.20	4870027
1,4-Dichlorobenzene	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	<0.50	<0.50	0.50	4870027
1,1-Dichloroethane	ug/L	<0.10	<0.10	<0.10	0.10	4870027
1,2-Dichloroethane	ug/L	<0.20	<0.20	<0.20	0.20	4870027
1,1-Dichloroethylene	ug/L	<0.10	<0.10	<0.10	0.10	4870027
cis-1,2-Dichloroethylene	ug/L	<0.10	<0.10	<0.10	0.10	4870027
trans-1,2-Dichloroethylene	ug/L	<0.10	<0.10	<0.10	0.10	4870027
1,2-Dichloropropane	ug/L	<0.10	<0.10	<0.10	0.10	4870027
cis-1,3-Dichloropropene	ug/L	<0.20	<0.20	<0.20	0.20	4870027
trans-1,3-Dichloropropene	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Ethylbenzene	ug/L	<0.10	<0.10	0.10	0.10	4870027
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Hexane	ug/L	<0.50	<0.50	<0.50	0.50	4870027
Methylene Chloride(Dichloromethane)	ug/L	<0.50	<0.50	<0.50	0.50	4870027
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	<5.0	<5.0	5.0	4870027
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	5.0	4870027
Methyl t-butyl ether (MTBE)	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Styrene	ug/L	<0.20	<0.20	<0.20	0.20	4870027
1,1,1,2-Tetrachloroethane	ug/L	<0.20	<0.20	<0.20	0.20	4870027
1,1,2,2-Tetrachloroethane	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Tetrachloroethylene	ug/L	<0.10	<0.10	<0.10	0.10	4870027
Toluene	ug/L	<0.20	<0.20	0.87	0.20	4870027
1,1,1-Trichloroethane	ug/L	<0.10	<0.10	<0.10	0.10	4870027

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B733261
Report Date: 2017/02/27

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

O.REG 153 VOLATILE ORGANICS (WATER)

Maxxam ID		DXT570	DXT571	DXT572		
Sampling Date		2017/02/17 10:00	2017/02/16 13:00	2017/02/17 09:45		
	UNITS	MW17-1	MW17-2	MW17-3	RDL	QC Batch
1,1,2-Trichloroethane	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Trichloroethylene	ug/L	<0.10	<0.10	<0.10	0.10	4870027
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	<0.20	<0.20	0.20	4870027
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	0.20	4870027
p+m-Xylene	ug/L	0.18	<0.10	0.43	0.10	4870027
o-Xylene	ug/L	<0.10	<0.10	0.20	0.10	4870027
Total Xylenes	ug/L	0.18	<0.10	0.63	0.10	4870027
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	100	99	100		4870027
D4-1,2-Dichloroethane	%	108	108	107		4870027
D8-Toluene	%	100	98	99		4870027

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B733261
Report Date: 2017/02/27

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

TEST SUMMARY

Maxxam ID: DXT570
Sample ID: MW17-1
Matrix: Water

Collected: 2017/02/17
Shipped:
Received: 2017/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4867689	N/A	2017/02/23	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4866183	N/A	2017/02/22	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4869718	2017/02/20	2017/02/21	Liliana Gaburici
Volatile Organic Compounds in Water	P&T/MS	4870027	N/A	2017/02/23	Rebecca Schultz

Maxxam ID: DXT571
Sample ID: MW17-2
Matrix: Water

Collected: 2017/02/16
Shipped:
Received: 2017/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4867689	N/A	2017/02/23	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4870106	N/A	2017/02/22	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4869718	2017/02/20	2017/02/21	Liliana Gaburici
Volatile Organic Compounds in Water	P&T/MS	4870027	N/A	2017/02/23	Rebecca Schultz

Maxxam ID: DXT572
Sample ID: MW17-3
Matrix: Water

Collected: 2017/02/17
Shipped:
Received: 2017/02/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4867689	N/A	2017/02/23	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4870106	N/A	2017/02/22	Lyndsey Hart
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4869718	2017/02/20	2017/02/21	Liliana Gaburici
Volatile Organic Compounds in Water	P&T/MS	4870027	N/A	2017/02/23	Rebecca Schultz

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Maxxam Job #: B733261
Report Date: 2017/02/27

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.7°C

Custody seal was not present on the cooler.
The samples were received at the laboratory with ice in the cooler.

Results relate only to the items tested.

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Maxxam Job #: B733261
Report Date: 2017/02/27

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4866183	1,4-Difluorobenzene	2017/02/21	107	70 - 130	102	70 - 130	111	%		
4866183	4-Bromofluorobenzene	2017/02/21	103	70 - 130	96	70 - 130	101	%		
4866183	D10-Ethylbenzene	2017/02/21	118	70 - 130	105	70 - 130	118	%		
4866183	D4-1,2-Dichloroethane	2017/02/21	108	70 - 130	102	70 - 130	113	%		
4869718	o-Terphenyl	2017/02/20	102	30 - 130	101	30 - 130	99	%		
4870027	4-Bromofluorobenzene	2017/02/22	100	70 - 130	101	70 - 130	98	%		
4870027	D4-1,2-Dichloroethane	2017/02/22	105	70 - 130	105	70 - 130	107	%		
4870027	D8-Toluene	2017/02/22	99	70 - 130	99	70 - 130	98	%		
4870106	1,4-Difluorobenzene	2017/02/22	104	70 - 130	107	70 - 130	108	%		
4870106	4-Bromofluorobenzene	2017/02/22	100	70 - 130	100	70 - 130	104	%		
4870106	D10-Ethylbenzene	2017/02/22	112	70 - 130	104	70 - 130	107	%		
4870106	D4-1,2-Dichloroethane	2017/02/22	107	70 - 130	106	70 - 130	109	%		
4866183	F1 (C6-C10) - BTEX	2017/02/21					<25	ug/L	NC	40
4866183	F1 (C6-C10)	2017/02/21	95	70 - 130	102	70 - 130	<25	ug/L	NC	40
4869718	F2 (C10-C16 Hydrocarbons)	2017/02/21	91	50 - 130	90	80 - 120	<100	ug/L	NC	50
4869718	F3 (C16-C34 Hydrocarbons)	2017/02/21	91	50 - 130	90	80 - 120	<200	ug/L	NC	50
4869718	F4 (C34-C50 Hydrocarbons)	2017/02/21	91	50 - 130	90	80 - 120	<200	ug/L	NC	50
4870027	1,1,1,2-Tetrachloroethane	2017/02/23	106	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
4870027	1,1,1-Trichloroethane	2017/02/23	100	70 - 130	90	70 - 130	<0.10	ug/L	NC	30
4870027	1,1,2,2-Tetrachloroethane	2017/02/23	109	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
4870027	1,1,2-Trichloroethane	2017/02/23	104	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
4870027	1,1-Dichloroethane	2017/02/23	98	70 - 130	91	70 - 130	<0.10	ug/L	NC	30
4870027	1,1-Dichloroethylene	2017/02/23	100	70 - 130	89	70 - 130	<0.10	ug/L	NC	30
4870027	1,2-Dichlorobenzene	2017/02/23	108	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
4870027	1,2-Dichloroethane	2017/02/23	103	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
4870027	1,2-Dichloropropane	2017/02/23	103	70 - 130	94	70 - 130	<0.10	ug/L	NC	30
4870027	1,3-Dichlorobenzene	2017/02/23	106	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
4870027	1,4-Dichlorobenzene	2017/02/23	107	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
4870027	Acetone (2-Propanone)	2017/02/23	116	60 - 140	100	60 - 140	<10	ug/L	NC	30
4870027	Benzene	2017/02/23	100	70 - 130	90	70 - 130	<0.10	ug/L	NC	30
4870027	Bromodichloromethane	2017/02/23	106	70 - 130	97	70 - 130	<0.10	ug/L	NC	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4870027	Bromoform	2017/02/23	110	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
4870027	Bromomethane	2017/02/23	96	60 - 140	84	60 - 140	<0.50	ug/L	NC	30
4870027	Carbon Tetrachloride	2017/02/23	105	70 - 130	94	70 - 130	<0.10	ug/L	NC	30
4870027	Chlorobenzene	2017/02/23	106	70 - 130	97	70 - 130	<0.10	ug/L	NC	30
4870027	Chloroform	2017/02/23	99	70 - 130	91	70 - 130	<0.10	ug/L	NC	30
4870027	cis-1,2-Dichloroethylene	2017/02/23	101	70 - 130	91	70 - 130	<0.10	ug/L	NC	30
4870027	cis-1,3-Dichloropropene	2017/02/23	105	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
4870027	Dibromochloromethane	2017/02/23	106	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
4870027	Dichlorodifluoromethane (FREON 12)	2017/02/22	64	60 - 140	56 (1)	60 - 140	<0.50	ug/L		
4870027	Ethylbenzene	2017/02/23	106	70 - 130	97	70 - 130	<0.10	ug/L	NC	30
4870027	Ethylene Dibromide	2017/02/23	105	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
4870027	Hexane	2017/02/22	95	70 - 130	84	70 - 130	<0.50	ug/L		
4870027	Methyl Ethyl Ketone (2-Butanone)	2017/02/23	107	60 - 140	94	60 - 140	<5.0	ug/L	NC	30
4870027	Methyl Isobutyl Ketone	2017/02/23	112	70 - 130	101	70 - 130	<5.0	ug/L	NC	30
4870027	Methyl t-butyl ether (MTBE)	2017/02/23	101	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
4870027	Methylene Chloride(Dichloromethane)	2017/02/23	88	70 - 130	81	70 - 130	<0.50	ug/L	NC	30
4870027	o-Xylene	2017/02/23	104	70 - 130	96	70 - 130	<0.10	ug/L	NC	30
4870027	p+m-Xylene	2017/02/23	105	70 - 130	95	70 - 130	<0.10	ug/L	NC	30
4870027	Styrene	2017/02/23	104	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
4870027	Tetrachloroethylene	2017/02/23	101	70 - 130	90	70 - 130	<0.10	ug/L	NC	30
4870027	Toluene	2017/02/23	103	70 - 130	92	70 - 130	<0.20	ug/L	NC	30
4870027	Total Xylenes	2017/02/23					<0.10	ug/L	NC	30
4870027	trans-1,2-Dichloroethylene	2017/02/23	94	70 - 130	83	70 - 130	<0.10	ug/L	NC	30
4870027	trans-1,3-Dichloropropene	2017/02/23	106	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
4870027	Trichloroethylene	2017/02/23	100	70 - 130	88	70 - 130	<0.10	ug/L	NC	30
4870027	Trichlorofluoromethane (FREON 11)	2017/02/23	96	70 - 130	85	70 - 130	<0.20	ug/L	NC	30
4870027	Vinyl Chloride	2017/02/23	91	70 - 130	80	70 - 130	<0.20	ug/L	NC	30
4870106	F1 (C6-C10) - BTEX	2017/02/22					<25	ug/L	NC	40

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Report Date: 2017/02/27

QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4870106	F1 (C6-C10)	2017/02/22	90	70 - 130	97	70 - 130	<25	ug/L	NC	40

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

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Maxxam Job #: B733261
Report Date: 2017/02/27

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: BC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Services

Steve Roberts, Ottawa Lab Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam
A Bureau Veritas Group Company

Your Project #: 122170005.200
Your C.O.C. #: 600334-01-01

Attention:Allen MacGarvie

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/03/03
Report #: R4379740
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B740499
Received: 2017/02/28, 14:50

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	3	N/A	2017/03/03	CAM SOP-00301	EPA 8270D m
Chromium (VI) in Water (1)	3	N/A	2017/03/01	CAM SOP-00436	EPA 7199 m
Petroleum Hydro. CCME F1 & BTEX in Water	1	N/A	2017/03/02	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water (2)	1	2017/03/02	2017/03/02	OTT SOP-00001	CCME Hydrocarbons
Mercury (1)	3	2017/03/02	2017/03/02	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS (1)	3	N/A	2017/03/02	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM)	3	2017/03/02	2017/03/03	OTT SOP-00011	EPA 8270D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

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Your Project #: 122170005.200
Your C.O.C. #: 600334-01-01

Attention:Allen MacGarvie

Stantec Consulting Ltd
1331 Clyde Avenue
Suite 400
Ottawa, ON
K2C 3G4

Report Date: 2017/03/03
Report #: R4379740
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B740499
Received: 2017/02/28, 14:50

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (613) 274-0573
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B740499
Report Date: 2017/03/03

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		DZC369	DZC369	DZC370		
Sampling Date		2017/02/28 12:10	2017/02/28 12:10	2017/02/28 13:40		
COC Number		600334-01-01	600334-01-01	600334-01-01		
	UNITS	MW 17-2	MW 17-2 Lab-Dup	MW 17-3	RDL	QC Batch
BTEX & F1 Hydrocarbons						
Benzene	ug/L			<0.20	0.20	4881734
Toluene	ug/L			<0.20	0.20	4881734
Ethylbenzene	ug/L			<0.20	0.20	4881734
o-Xylene	ug/L			<0.20	0.20	4881734
p+m-Xylene	ug/L			<0.40	0.40	4881734
Total Xylenes	ug/L			<0.40	0.40	4881734
F1 (C6-C10) - BTEX	ug/L			<25	25	4881734
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100		100	4883753
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200		200	4883753
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200		200	4883753
Reached Baseline at C50	ug/L	Yes	Yes			4883753
Surrogate Recovery (%)						
1,4-Difluorobenzene	%			98		4881734
4-Bromofluorobenzene	%			93		4881734
D10-Ethylbenzene	%			102		4881734
D4-1,2-Dichloroethane	%			102		4881734
o-Terphenyl	%	98	93			4883753

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Report Date: 2017/03/03

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

O.REG 153 METALS PACKAGE (WATER)

Maxxam ID		DZC368		DZC369		DZC370	DZC370		
Sampling Date		2017/02/28 11:15		2017/02/28 12:10		2017/02/28 13:40	2017/02/28 13:40		
COC Number		600334-01-01		600334-01-01		600334-01-01	600334-01-01		
	UNITS	MW 17-1	RDL	MW 17-2	RDL	MW 17-3	MW 17-3 Lab-Dup	RDL	QC Batch
Metals									
Chromium (VI)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	<0.50	0.50	4881758
Mercury (Hg)	ug/L	<0.1	0.1	<0.1	0.1	<0.1		0.1	4883043
Dissolved Antimony (Sb)	ug/L	0.61	0.50	0.56	0.50	<0.50		0.50	4882635
Dissolved Arsenic (As)	ug/L	<1.0	1.0	<1.0	1.0	<1.0		1.0	4882635
Dissolved Barium (Ba)	ug/L	110	2.0	65	2.0	51		2.0	4882635
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	0.50	<0.50		0.50	4882635
Dissolved Boron (B)	ug/L	240	10	130	10	50		10	4882635
Dissolved Cadmium (Cd)	ug/L	0.10	0.10	<0.10	0.10	<0.10		0.10	4882635
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	<5.0		5.0	4882635
Dissolved Cobalt (Co)	ug/L	0.92	0.50	<0.50	0.50	<0.50		0.50	4882635
Dissolved Copper (Cu)	ug/L	1.3	1.0	1.9	1.0	1.1		1.0	4882635
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	0.50	<0.50		0.50	4882635
Dissolved Molybdenum (Mo)	ug/L	3.5	0.50	0.66	0.50	<0.50		0.50	4882635
Dissolved Nickel (Ni)	ug/L	9.2	1.0	2.3	1.0	2.5		1.0	4882635
Dissolved Selenium (Se)	ug/L	<2.0	2.0	2.2	2.0	<2.0		2.0	4882635
Dissolved Silver (Ag)	ug/L	<0.10	0.10	<0.10	0.10	<0.10		0.10	4882635
Dissolved Sodium (Na)	ug/L	320000	100	580000	100	180000		100	4882635
Dissolved Thallium (Tl)	ug/L	0.13	0.050	0.10	0.050	0.073		0.050	4882635
Dissolved Uranium (U)	ug/L	1.8	0.10	0.94	0.10	0.97		0.10	4882635
Dissolved Vanadium (V)	ug/L	<0.50	0.50	<1.0	1.0	<0.50		0.50	4882635
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	<5.0		5.0	4882635

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Client Project #: 122170005.200
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O.REG 153 PAHS (WATER)

Maxxam ID		DZC368	DZC369	DZC369	DZC370		
Sampling Date		2017/02/28 11:15	2017/02/28 12:10	2017/02/28 12:10	2017/02/28 13:40		
COC Number		600334-01-01	600334-01-01	600334-01-01	600334-01-01		
	UNITS	MW 17-1	MW 17-2	MW 17-2 Lab-Dup	MW 17-3	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/L	<0.071	<0.071		<0.071	0.071	4880401
Polyaromatic Hydrocarbons							
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Benzo(a)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Benzo(a)pyrene	ug/L	0.030	<0.010	<0.010	<0.010	0.010	4883258
Benzo(b/j)fluoranthene	ug/L	0.050	<0.050	<0.050	<0.050	0.050	4883258
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Fluoranthene	ug/L	0.070	<0.050	<0.050	<0.050	0.050	4883258
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Naphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	4883258
Phenanthrene	ug/L	0.040	<0.030	<0.030	<0.030	0.030	4883258
Pyrene	ug/L	0.080	<0.050	<0.050	<0.050	0.050	4883258
Surrogate Recovery (%)							
D10-Anthracene	%	85	91	85	92		4883258
D14-Terphenyl (FS)	%	84	81	77	78		4883258
D8-Acenaphthylene	%	79	79	78	79		4883258

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TEST SUMMARY

Maxxam ID: DZC368
Sample ID: MW 17-1
Matrix: Water

Collected: 2017/02/28
Shipped:
Received: 2017/02/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4880401	N/A	2017/03/03	Steve Roberts
Chromium (VI) in Water	IC	4881758	N/A	2017/03/01	Lang Le
Mercury	CV/AA	4883043	2017/03/02	2017/03/02	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4882635	N/A	2017/03/02	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4883258	2017/03/02	2017/03/03	Arezoo Habibagahi

Maxxam ID: DZC369
Sample ID: MW 17-2
Matrix: Water

Collected: 2017/02/28
Shipped:
Received: 2017/02/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4880401	N/A	2017/03/03	Steve Roberts
Chromium (VI) in Water	IC	4881758	N/A	2017/03/01	Lang Le
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4883753	2017/03/02	2017/03/02	Liliana Gaburici
Mercury	CV/AA	4883043	2017/03/02	2017/03/02	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4882635	N/A	2017/03/02	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4883258	2017/03/02	2017/03/03	Arezoo Habibagahi

Maxxam ID: DZC369 Dup
Sample ID: MW 17-2
Matrix: Water

Collected: 2017/02/28
Shipped:
Received: 2017/02/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4883753	2017/03/02	2017/03/02	Liliana Gaburici
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4883258	2017/03/02	2017/03/03	Arezoo Habibagahi

Maxxam ID: DZC370
Sample ID: MW 17-3
Matrix: Water

Collected: 2017/02/28
Shipped:
Received: 2017/02/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4880401	N/A	2017/03/03	Steve Roberts
Chromium (VI) in Water	IC	4881758	N/A	2017/03/01	Lang Le
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4881734	N/A	2017/03/02	Lyndsey Hart
Mercury	CV/AA	4883043	2017/03/02	2017/03/02	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4882635	N/A	2017/03/02	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4883258	2017/03/02	2017/03/03	Arezoo Habibagahi

Maxxam ID: DZC370 Dup
Sample ID: MW 17-3
Matrix: Water

Collected: 2017/02/28
Shipped:
Received: 2017/02/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	4881758	N/A	2017/03/01	Lang Le

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.0°C

Cooler custody seal was present and intact.
The samples were received at the laboratory on the sampling date with ice in the cooler.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 122170005.200
Sampler Initials: RL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4881734	1,4-Difluorobenzene	2017/03/02	100	70 - 130	102	70 - 130	104	%		
4881734	4-Bromofluorobenzene	2017/03/02	96	70 - 130	96	70 - 130	93	%		
4881734	D10-Ethylbenzene	2017/03/02	113	70 - 130	107	70 - 130	114	%		
4881734	D4-1,2-Dichloroethane	2017/03/02	98	70 - 130	99	70 - 130	97	%		
4883258	D10-Anthracene	2017/03/03	87	50 - 130	90	50 - 130	86	%		
4883258	D14-Terphenyl (FS)	2017/03/03	83	50 - 130	82	50 - 130	81	%		
4883258	D8-Acenaphthylene	2017/03/03	83	50 - 130	82	50 - 130	78	%		
4883753	o-Terphenyl	2017/03/02	98	30 - 130	100	30 - 130	96	%		
4881734	Benzene	2017/03/02	96	70 - 130	121	70 - 130	<0.20	ug/L	NC	40
4881734	Ethylbenzene	2017/03/02	100	70 - 130	122	70 - 130	<0.20	ug/L	NC	40
4881734	F1 (C6-C10) - BTEX	2017/03/02					<25	ug/L	NC	40
4881734	o-Xylene	2017/03/02	104	70 - 130	120	70 - 130	<0.20	ug/L	NC	40
4881734	p+m-Xylene	2017/03/02	92	70 - 130	105	70 - 130	<0.40	ug/L	NC	40
4881734	Toluene	2017/03/02	88	70 - 130	92	70 - 130	<0.20	ug/L	NC	40
4881734	Total Xylenes	2017/03/02					<0.40	ug/L	NC	40
4881758	Chromium (VI)	2017/03/01	102	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Antimony (Sb)	2017/03/02	117	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Arsenic (As)	2017/03/02	107	80 - 120	99	80 - 120	<1.0	ug/L	5.7	20
4882635	Dissolved Barium (Ba)	2017/03/02	113	80 - 120	98	80 - 120	<2.0	ug/L	1.1	20
4882635	Dissolved Beryllium (Be)	2017/03/02	101	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Boron (B)	2017/03/02	97	80 - 120	97	80 - 120	<10	ug/L	0.73	20
4882635	Dissolved Cadmium (Cd)	2017/03/02	107	80 - 120	98	80 - 120	<0.10	ug/L	NC	20
4882635	Dissolved Chromium (Cr)	2017/03/02	104	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
4882635	Dissolved Cobalt (Co)	2017/03/02	98	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Copper (Cu)	2017/03/02	108	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
4882635	Dissolved Lead (Pb)	2017/03/02	94	80 - 120	94	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Molybdenum (Mo)	2017/03/02	116	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Nickel (Ni)	2017/03/02	95	80 - 120	95	80 - 120	<1.0	ug/L	NC	20
4882635	Dissolved Selenium (Se)	2017/03/02	98	80 - 120	97	80 - 120	<2.0	ug/L	NC	20
4882635	Dissolved Silver (Ag)	2017/03/02	98	80 - 120	94	80 - 120	<0.10	ug/L	NC	20
4882635	Dissolved Sodium (Na)	2017/03/02	NC	80 - 120	96	80 - 120	<100	ug/L	3.0	20

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4882635	Dissolved Thallium (Tl)	2017/03/02	93	80 - 120	94	80 - 120	<0.050	ug/L	NC	20
4882635	Dissolved Uranium (U)	2017/03/02	100	80 - 120	96	80 - 120	<0.10	ug/L	1.0	20
4882635	Dissolved Vanadium (V)	2017/03/02	106	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
4882635	Dissolved Zinc (Zn)	2017/03/02	95	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
4883043	Mercury (Hg)	2017/03/02	103	75 - 125	90	80 - 120	<0.1	ug/L	NC	20
4883258	1-Methylnaphthalene	2017/03/03	60	50 - 130	58	50 - 130	<0.050	ug/L	NC	30
4883258	2-Methylnaphthalene	2017/03/03	61	50 - 130	59	50 - 130	<0.050	ug/L	NC	30
4883258	Acenaphthene	2017/03/03	75	50 - 130	70	50 - 130	<0.050	ug/L	NC	30
4883258	Acenaphthylene	2017/03/03	70	50 - 130	66	50 - 130	<0.050	ug/L	NC	30
4883258	Anthracene	2017/03/03	68	50 - 130	69	50 - 130	<0.050	ug/L	NC	30
4883258	Benzo(a)anthracene	2017/03/03	80	50 - 130	79	50 - 130	<0.050	ug/L	NC	30
4883258	Benzo(a)pyrene	2017/03/03	65	50 - 130	65	50 - 130	<0.010	ug/L	NC	30
4883258	Benzo(b/j)fluoranthene	2017/03/03	65	50 - 130	73	50 - 130	<0.050	ug/L	NC	30
4883258	Benzo(g,h,i)perylene	2017/03/03	61	50 - 130	62	50 - 130	<0.050	ug/L	NC	30
4883258	Benzo(k)fluoranthene	2017/03/03	57	50 - 130	52	50 - 130	<0.050	ug/L	NC	30
4883258	Chrysene	2017/03/03	74	50 - 130	75	50 - 130	<0.050	ug/L	NC	30
4883258	Dibenz(a,h)anthracene	2017/03/03	59	50 - 130	58	50 - 130	<0.050	ug/L	NC	30
4883258	Fluoranthene	2017/03/03	72	50 - 130	73	50 - 130	<0.050	ug/L	NC	30
4883258	Fluorene	2017/03/03	72	50 - 130	68	50 - 130	<0.050	ug/L	NC	30
4883258	Indeno(1,2,3-cd)pyrene	2017/03/03	61	50 - 130	64	50 - 130	<0.050	ug/L	NC	30
4883258	Naphthalene	2017/03/03	54	50 - 130	59	50 - 130	<0.050	ug/L	NC	30
4883258	Phenanthrene	2017/03/03	67	50 - 130	67	50 - 130	<0.030	ug/L	NC	30
4883258	Pyrene	2017/03/03	70	50 - 130	72	50 - 130	<0.050	ug/L	NC	30
4883753	F2 (C10-C16 Hydrocarbons)	2017/03/02	95	50 - 130	96	80 - 120	<100	ug/L	NC	50
4883753	F3 (C16-C34 Hydrocarbons)	2017/03/02	95	50 - 130	96	80 - 120	<200	ug/L	NC	50

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QUALITY ASSURANCE REPORT(CONT'D)

Stantec Consulting Ltd
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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4883753	F4 (C34-C50 Hydrocarbons)	2017/03/02	95	50 - 130	96	80 - 120	<200	ug/L	NC	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Steve Roberts, Ottawa Lab Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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