Peto MacCallum Ltd.
CONSULTING ENGINEERS

ADDENDUM TO PHASE TWO ENVIRONMENTAL SITE ASSESSMENT: DELINEATION HALTON DISTRICT SCHOOL BOARD SURPLUS LAND ON STONEHAVEN DRIVE STONEHAVEN DRIVE BURLINGTON, ONTARIO

for

HALTON DISTRICT SCHOOL BOARD

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Peto MacCallum Ltd.
CONSULTING ENGINEERS

August 14, 2013

PML Ref.: 13HX002
Report: 4

Mr. Domenico Renzella
Halton District School Board
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Dear Mr. Renzella

Addendum to
Phase Two Environmental Site Assessment: Delineation
Halton District School Board Surplus Land on Stonehaven Drive
Stonehaven Drive
Burlington, Ontario

This report presents the results of delineation of soil contamination completed for a parcel of land located on Stonehaven Drive in Burlington, Ontario. Authorization to proceed with this project was provided under revised Purchase Order No. 4500046552, dated January 16, 2013 with Engineering Services Agreements (Change Order No. 1) to be signed and returned.

This report represents an Addendum to a Phase Two Environmental Site Assessment (ESA) and addresses delineation of soil contamination at the above site and must be read in conjunction with the Phase Two ESA dated May 8, 2013 (PML Ref.: 13HX002, Report 2)

Included in this report are the findings of the delineation and our conclusions and recommendations together with the appendices. The assignment is subject to the Statement of Limitations that is included in Appendix C and must be read in conjunction with this report.

We trust the information presented in this report is sufficient for your present purposes. If you have any questions, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

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Associate
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Table 1 – Summary of Samples Submitted for Chemical Analysis
List of Abbreviations
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Drawing 4-1 – Delineation Site Plan
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Appendix C – Statement of Limitations

1. INTRODUCTION

Delineation of contaminated soil has been completed under the supervision of Peto MacCallum Ltd. (PML) for portions of the property located at 2474 Sutton Drive in Burlington, Ontario as shown on Drawing 4-1 (referred to herein as the 'Site'). This report constitutes an Addendum to a Phase Two Environmental Site Assessment (ESA), which addresses delineation of soil contamination at the Site and which must be read in conjunction with the Phase Two ESA report dated May 8, 2013 (PML Ref.: 13HX002, Report 2). This report is a continuation of the mandatory Table of Contents Delineation Section as required under Part XII, Schedule E, Table 1 of O. Reg. 153/04, as amended. Only pertinent report sections are included.

In accordance with the current regulatory requirements, all environmental site assessment work was carried out under the supervision of a Qualified Person as defined in O. Reg. 153/04, as amended.

This assignment addresses three discreet areas of documented soil contamination (Areas 1 through 3) and a topsoil stockpile.

1.1 Applicable Site Condition Standard

The Phase Two ESA provided the rationale for and determined the applicable Site Condition Standards. The Table 3 (T3) Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition (T3 RPI) apply to the Site.

2. BACKGROUND INFORMATION

2.1 Past Investigations

2.1.1 Historical Investigations

In addition to the Phase One and Two ESAs recently completed for the Site (PML Ref.: 13HX002 Reports 1 and 2), the following previous environmental investigation reports for the Site and surrounding properties were made available for this assignment by the HDSB, or obtained from PML's archived files.

- Document 1: Phase I ESA, 2506 Orchard Road, Burlington, PML Ref.: 06HX011, Report 1, dated April 13, 2006;

- Document 2: Phase II ESA, 2506 Orchard Road, Burlington, PML Ref.: 06HX011A, Report 1, dated July 10, 2006;
- Document 4: Preliminary Findings, Phase I ESA Update, Bucci Property – Sutton Drive and Dundas Street, Burlington, PML Ref.: 06HX045, Report 1, dated November 23, 2006;
- Document 5: Phase I ESA, Part of Lots 3 and 4, Concession 1, S.D.S., Orchard Road and Dundas Street, Burlington, Terraprobe Ref.: 983140, dated January 11, 1999;
- Document 6: Phase I ESA, Proposed Orchard North Subdivision, Burlington, Soil-Mat Project No.: SM 021089-E, dated June 28, 2002; and
- Document 7: Environmental Investigation, Contractor Access Area, Dundas Street, Ontario, Terraprobe File No. 13-12-2106, dated October 24, 2012.

Pertinent information from the above mentioned reports is summarized in the Phase Two ESA.

Decommissioning of the ground water monitoring wells installed during the Phase Two ESA was carried out in conjunction with this assignment, the results of which are reported under separate cover (PML Ref.: 13HX002, Report 3).

2.2 Phase Two ESA Conclusions and Recommendation

The Phase Two ESA provided the following discussion relevant to this assignment.

2.2.1 Topsoil Stockpile

Regarding the topsoil stockpile, it is not known if divestiture of Area C is planned to include this material. It is noted that previous testing of this material indicated that it did not meet the T3 RPI Standards currently applicable to the Site for EC. With the exception of the sample from TP12 + TP13, which represents an area of the stockpile which appears to be no longer present, the other previous EC results met or were very close to the T2 or T3 ICC standards for EC. While the chemical testing of the existing stockpile does not meet the current SCSs and requires removal for the current property use it does not necessarily require disposal to a landfill. It may be re-useable at an ICC property.

2.2.2 Area 1

Soil analysis from the 2006 Phase II ESA for sample TP9 GS2, which met the PHC Fraction F3 Standard at the time, no longer meets the current T3 RPI Standards. Additionally, chemical testing from the 2012 Terraprobe report identified PHC Fraction F3 and F4 exceedances in the

vicinity of TP9 GS2. Chemical testing of soil from BH111 met the T3 RPI Standards, however PHCs were detected.

PHC soil contamination in Area 1 has not yet been effectively delineated using the current clean to clean methodology and hence no quantity of contaminated soil in this area is provided. It is noted that not all sample results from this area exceeded the T3 RPI Standards and the contamination is confined to the relatively shallow surface soil.

2.2.3 Area 2

While boron hot water extractable (HWS) exceedances were not encountered during this investigation, previous studies identified boron (HWS) contamination at the Site. It is noted that the boron (HWS) Standard applies only to surface soil, whereas total boron applies to subsurface soil. While the boron (HWS) exceedances were all encountered in the surface soil and require removal from this position in order to meet the RPI or ICC Standards, this soil may not require disposal to a landfill. It may be re-used either on site or off site at RPI and ICC properties, provided it is placed below 1.5 m as subsurface soil.

This area of contamination has not yet been effectively delineated using the current clean to clean methodology and hence no quantity of contaminated soil in this area is provided. It is noted that not all sample results from this area exceeded the T3 RPI Standards and contamination is confined to the relatively shallow surface soil.

2.2.4 Area 3

Soil analysis from the 2006 Phase II ESA indicated that PHC contamination was present in the fill soils in this area and an estimated volume was provided. Subsequent soil analysis completed by Terraprobe in 2012 and in this Phase Two ESA indicated that PHC and now cadmium and boron HWS contamination was documented beyond the 2006 delineation. As with Area 1, soil contamination in this area has not yet been effectively delineated, however based on a very conservative clean to clean approach the area of contamination may cover a plan area of 3515 m^2, which equates to a volume of 3515 m^3, or 7030 tonnes (based on an average density of 2.0 tonnes/m^3)

2.2.5 Next Steps

Regard the topsoil stockpile, it is recommended that the stockpile be surveyed in order to determine an accurate quantity and once a possible ICC receiving site is found for this material a program of additional soil sampling and chemical testing be completed for the stockpiled material in accordance with the receiving site requirements.

Regarding Area 2, boron (HWS) contamination of surface soils, it is recommended that this area be remediated in order to meet the current T3 RPI SCSs, however soil with elevated boron HWS does not require landfill disposal.

Regarding, the PHC and cadmium contamination, it is recommended that this area be remediated in order to meet the current T3 RPI SCSs and that contaminated soil be disposed of to a landfill.

For Areas 1 and 3 the following options are provided:

1. Proceed directly to site remediation with an unknown quantity of contaminated soil which requires disposal to landfill; or
2. Complete a program of delineation in order to provide a detailed estimate of quantities, which require disposal to landfill, so that an estimated budget can be prepared.

3. SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The Addendum to Phase Two ESA: Delineation, consisting of a soil sampling and chemical testing program, was conducted for the Site in order to address the recommendations in the Phase Two ESA and to provide an estimated quantity of soil which requires remediation.

The scope of this assignment included:

- Excavation of test pits,
- Soil sampling,
- Chemical analysis of soil samples,

- Data compilation and evaluation of the information gathered, and
- Preparation of this report, discussing the information compiled and the corresponding conclusions and recommendations.

3.2 Media Investigated

Based on the Phase Two ESA, the media impacted at the Site was soil. No ground water contamination was identified and no sediment was present.

3.3 Deviations from Sampling and Analysis Plan

Copies of the Geoenvironmental Field Instruction Sheet / Sampling and Analysis Plan are included in Appendix A. During completion of this assignment no significant deviations were encountered from the sampling and analysis plan.

3.4 Impediments

No physical impediments occurred during the course of this assignment.

4. INVESTIGATION METHOD

4.1 General

The field work for the Addendum to Phase Two ESA: Delineation was carried out on June 18, 2013. Thirty-two test pits (TP 101 through BH 132) were excavated to depths of 0.7 to 1.6 m below grade.

The test pits were strategically located on Site in relation to the areas of soil contamination identified during the Phase Two ESA. A copy of the Geoenvironmental Field Instructions and Sampling & Analysis plan is included in Appendix A.

The test pit (TP) locations were established in the field by PML as shown on Drawing 4-1, appended.

In addition, three grab samples were obtained from the topsoil stockpile.

4.2 Excavation

The test pits were excavated using John Deere 410J rubber tire backhoe, supplied and operated by G. Mason Construction, working under the full time supervision of a member of our technical staff.

Appropriate precautions were taken and equipment and sampling tools decontamination was carried out during field work to minimize potential cross-contamination between samples and test pit locations.

In an effort to minimize potential cross-contamination between samples and boreholes, sampling and sample handling equipment were decontaminated prior to and between taking samples. New nitrile gloves were used for handling each sample.

During the field work, soil samples in the test pits were collected at near continuous depth intervals, sampling each stratum encountered discretely.

4.3 Soil: Sampling

During the field work, soil samples were collected using hand sampling techniques, generally from the backhoe bucket. The soil samples were field logged and examined for geoenvironmental classification, placed in laboratory provided airtight amber glass containers and/or vials containing methanol preservative and stored in an insulated cooler with ice for transportation to our laboratory for additional examination. As well, a portion of each sample was placed in a sealed plastic bag for vapour screening. Particular attention was applied to visual and olfactory evidence of potential contamination such as odours and staining during the course of the field work.

The three topsoil stockpile grab samples were also obtained using hand sampling methods. The sampling was facilitated by digging approximately 0.3 m deep into the pile using a washed shovel. The soil samples were field logged and examined for geoenvironmental classification, placed in laboratory provided airtight amber glass containers and stored in an insulated cooler with ice for transportation to our laboratory for additional examination.

The soil sampling and sample handling procedures were carried out according to the supporting documents of O. Reg. 153/04, as amended and established standards.

4.3.1 Summarized Subsurface Conditions

Reference is made to the appended Drawing 4-1, Log of Test Pit Sheets TP101 through TP132 for details of the field work including sampling locations, visual soil classification, standard penetration test N values (where applicable) and inferred stratigraphy, soil vapour concentrations.

Due to soil sampling procedures and limited sample size, the depth/elevation demarcations on the borehole logs must be viewed as transitional zones between layers, and cannot be construed as exact geologic boundaries between layers.

The subsurface stratigraphy revealed in the test pits typically comprised sand and gravel fill or topsoil or over native silts and clays.

4.3.1.1 Topsoil

Topsoil was contacted surficially in TP103, 104, 110, 112, 113, 115, 116, 117, 119, 120 and 124. The topsoil fill layer ranged in thickness from 100 to 900 mm and was generally underlain by native silt till. Native organic clay was encountered underlying the fill in TP108 and extended to the depth extent of the test pit.

4.3.1.2 Fill

Mixed fill comprising varying quantities of sand, gravel, silt and clay was contacted surficially in TP101, 102, 105 through 109, 111, 114, 118, 121 through 123 and 125 through 132. Locally the fill included asphalt fragments in TP101, 106 through 109, 121 through 123, 127, 128 and 131. A 100 mm layer of asphalt was encountered within the fill in TP123 and 131. The fill occasionally included metal plastic or brick fragments. The fill layer extended to depths between 0.3 and 1.6 m below grade and was generally underlain by clay or silt till. The fill layer was not penetrated in TP125.

4.3.1.3 Clay Till

Silty clay till was encountered beneath the fill in TP101, 123, 126, 127 and 131. The clay till was unoxidized grey, contained occasional red shale fragments and extended to the depth extent of the test pits in all except TP 127 and 131 where it was underlain by silt till at depths of 1.5 and 1.1 m, respectively.

4.3.1.4 Silt Till

Silt to sandy silt till was contacted in TP 102 through 107, 109 through 122, 124, 127 through 132. The silt till was generally oxidized brown, contained trace gravel and occasional shale fragments and extended to the depth extent of the test pits.

4.4 Field Screening Measurements

Soil samples were not screened in the field, however following completion of the field work, the soil samples were transported back to PML's laboratory where soil vapour concentrations (SVCs) were measured in the headspace of samples, which had sufficient recovery. The bagged soil samples were screened using a RKI Eagle Portable Gas Detector. The RKI Eagle detects a combination of combustible gases in parts per million (ppm) and was utilized with the methane response in the off position (to exclude methane). The accuracy of the RKI Eagle Portable Gas Detector is +/- 2% and the equipment is regularly calibrated using hexane by Argus-Hazco.

There are no regulatory criteria for soil vapours; however, soil vapours are often used as a screening tool to identify PHC impacted soils. Elevated SVCs, typically in the % of LEL range, are generally indicative of the presence of volatile products, such as gasoline or chlorinated degreasing solvents, and to a lesser extent diesel and fuel oil. It should be noted that 1% LEL is equivalent to 110 ppm based on a hexane calibration; the % LEL scale is typically used for soil vapours in excess of 500 ppm.

The correlation between combustible vapour concentrations and PHCs in soil is highly dependent on the soil type, moisture content and characteristics of the contaminant of concern. The results of the screening are used as a tool in establishing relative SVCs among samples and borehole locations.

4.5 Analytical Testing

Selected soil and ground water samples were submitted for chemical analysis to AGAT Laboratories Limited (AGAT), a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory in Mississauga, Ontario. The chemical analysis conducted by AGAT was in accordance with the O. Reg. 153/04 Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act dated March 9, 2004, amended as of July 1, 2011.

The rationale for sample selection was based on visual and olfactory evidence of potential contamination and known contamination documented in the Phase Two ESA.

The soil samples were analyzed for the contaminants of concern (COC), namely metals, boron hot water soluble (HWS), electrical conductivity (EC), petroleum hydrocarbon (PHC) Fractions F1 to F4, and benzene, toluene, ethylbenzene and xylenes (BTEX).

A summary listing of all soil samples submitted for analysis is included as Table 1, appended.

4.6 Residue Management Procedures

Excavated soil from test pitting operations was used to backfill the test pits upon completion.

4.7 Elevation Surveying

The borehole locations were selected and established in the field by PML. Ground surface elevations were established based on the relative elevations to boreholes surveyed during the Phase Two ESA.

4.8 Quality Assurance and Quality Control Measures

Soil samples were field logged and examined for geoenvironmental classification, placed in laboratory provided airtight amber glass containers with Teflon® lined lids and stored in an insulated cooler for transportation to our laboratory for additional examination. Soil samples analyzed for VOCs or PHC Fraction F1 were preserved in methanol in laboratory provided septum vials using a Terra Core® sub-sampler. As well, a portion of each soil sample was placed in a sealed plastic bag for later vapour screening.

Soil sample containers were labelled in the field with permanent marker by indicating the test pit, sample and project numbers and were cross referenced to the test pit logs.

Sampling equipment was decontaminated prior to and between taking samples by scrubbing with a wire brush and washing in a solution of Alconox soap. The sampling equipment was then rinsed with distilled water.

Field quality control measures were maintained through the use of test pit log sheets, field logbooks, sample labels and chain of custody records. Field logbooks and test pit log sheets were maintained by technical staff to record data collection and sampling activities.

The equipment used to collect samples was noted, along with the time of sampling, sampling description, depth from which the samples were collected, volume and number of containers. In addition, all samples were accompanied by a properly completed chain of custody record, which listed the sample identification, sample dates and time, sample matrix, the number of containers, and analytes for which the samples are to be tested.

Since the quality of data depends upon planning, sampling, analysis and reporting, duplicate soil and ground water samples were analyzed for Quality Assurance/Quality Control (QA/QC) purposes. In addition to the equipment and sampling tools decontamination procedures described above, the field Quality Control (QC) measures consisted of soil duplicate samples as per O. Reg. 153/04 as amended supporting documents.

The laboratory analytical methods consisted of the following:

- Soil samples were analysed by using standard reference methods and the testing methods were referenced in AGAT certificate of analysis (Appendix B) as required by the Ministry of Environment's (MOE's) protocol. Method blank, spiked method blank, laboratory spiked and duplicate soil samples were analysed with each batch of soil samples.
- A table of analytical data indicating parameters, estimated quantitation limit, corrected quantitation limit for dilute samples, percentage recovery, range of lower and upper limits was reported in AGAT certificate of analysis (Appendix B).

5. REVIEW AND EVALUATION

5.1 Fine-Medium Soil Texture

As previously indicated, the soil on Site generally comprised sand and gravel fill or topsoil fill or clay fill over native clay or silty clay till, underlain by native sandy silt till. The soils on Site vary between fine / medium texture to coarse texture. Due to the variation, the more stringent coarse textured soil criteria were chosen with respect to the regulatory criteria.

5.2 Soil: Field Screening

The measured concentrations on the headspace of recovered soil samples ranged from 0 to 30 parts per million (ppm), which are not considered to be significant.

5.3 Soil Quality

Laboratory certificates of analysis compared to Table 3 RPI Standards, are included in Appendix B. A summary of samples submitted for chemical testing including locations, depths and descriptions is included in Table 1, appended.

5.3.1 Topsoil Stockpile Testing

The measured values of EC in the tested grab samples from the topsoil stockpile met the T3 RPI standards.

5.3.2 Soil Contamination Areas

5.3.2.1 BTEX

The measured concentrations of BTEX parameters in the tested samples were below the method detection limit (not detected) and/or met the respective T3 RPI Standards.

The following is a summary of the exceedances of the T3 RPI Standards.

5.3.2.2 Metals and Inorganics

Analyte	T3 RPI Standard	Units	Sample ID	Measured Concentration
Zinc	340	µg/g	TP126 GS2	342
			TP129 GS2	360
Cadmium	1.2	µg/g	TP126 GS2	1.6
			TP129 GS2	1.4
Boron (HWS)	1.5*	µg/g	TP109 GS2	6.86
			TP111 GS2	1.68

5.3.2.3 PHC Fractions F1 to F4

Analyte	T3 RPI Standard	Units	Sample ID	Measured Concentration
PHC Fraction F3	300	µg/g	TP103 GS1	500
			TP123 GS3	510

Note: *Boron (HWS) Standard is for surface soil.

5.4 Quality Assurance and Quality Control Results

Soil and ground water samples were analysed by using standard reference methods and the testing methods were referenced in AGAT Certificate of Analysis, as required by the MOE's protocol. Laboratory QA/QC data is included with the Certificates of Analysis provided by in Appendix C. Method blank, spiked method blank, laboratory spiked and duplicate soil samples were analysed by the laboratory with each batch of samples. The results of chemical analysis of method blank sample indicated that the detected levels were within the acceptable range. The chemical test data for spiked method blank and laboratory spike samples indicated that the recovery ranges were within the statistically determined control limits.

The quality of data depends upon planning, sampling, analysis and reporting. As a means of determining the reproducibility or variability related to analytical procedures of the sample homogeneity, the relative percentage differences (RPD) between analyzed values for original and duplicate samples were calculated.

For sample reproducibility calculations, maximum relative percent difference (RPD) values were calculated using the following formula:

$$\text{RPD Value} = \left[\frac{\text{(Analyte A in Test 1 – Analyte A in Test 2)}}{\text{(Analyte A in Test 1 + Analyte A in Test 2) / 2}} \right] \times 100$$

Blind field duplicates were obtained by PML during the field work and submitted to AGAT; the maximum RPD values were as follows:

Sample ID(s)	Parameters Tested	Maximum RPD Values (%)
Soil		
Duplicates A through E	Metals	17
	Boron (HWS)	20
	EC	1.7
	PHC Fractions F1 to F4	NA
	BTEX	NA

Note: Maximum RPD values are provided as not applicable (NA) where one or both of the results were less than the reported detection limits (RDLs).

The maximum RPD for the duplicate samples were within the acceptable statistical variation of 30 to 40%,

6. CONCLUSIONS AND RECOMMENDATIONS

The purpose of the Addendum to Phase Two ESA: Delineation was to quantify the soil contamination at the Site and provide cost estimates for Site remediation.

6.1 Topsoil Stockpile

The dimensions of the topsoil stockpile at the time of the 2006 ESA work were significantly larger than those of the existing stockpile, as such it is not known if the soil represented at the original sample locations is still present at the Site. With the exception of the sample from TP12 + TP13, which represents an area of the stockpile which is most likely no longer present, the other previous EC results met or were very close to the T2 or T3 industrial/commercial/community (ICC) standards for EC, however exceeded the T3 RPI Standards applicable to the Site. The most likely location where the original stockpile soils may still be on Site is in the location of TP11-A, where the level of EC was measured at 1.44 mS/cm, which exceeds the T2 and T3 ICC standard of 1.4 mS/cm. While the exact location of TP11-A is not known for certain the sample Stockpile GS3 was taken as close as possible. Assuming the Stockpile GS1 sample was taken within 2 m of the original sample location and at the same depth interval the two results can be averaged. The measured level of EC in the sample Stockpile GS1 was 0.191 mS/cm and when averaged with the TP11-A result of 1.44 mS/cm produces a representative value of 0.807 mS/cm. Therefore, in accordance with Section 48 (2) of O. Reg. 153/04, as amended the T2 or T3 ICC Standard has been met since the average of two or more samples from the same sampling location meets the Standards. The remainder of the topsoil stockpile samples from this assignment met the T3 RPI Standards. In this regard, while the chemical testing of the existing stockpile does not meet the SCS and requires removal for the current property use it does not require disposal to a landfill. It may be re-useable at an ICC property.

6.1.1 Area 1

The contamination in this area is generally confined to the fill soil. Chemical testing indicates the native soil meets the applicable SCS and contamination does not extend vertically in the native soil. The dimensions of the Area 1 soil contamination were not fully delineated, since no clean

limits were established in the southwestern portion of the Area. For the purposes of estimating a total area, the maximum extent of historical surficial granular fill, as shown on a 2005 aerial photograph was used, since the contamination is thought to be associated with this fill material.

The contamination covers an approximate plan area of 225 m^2 as shown on Drawing 4-1 and is about 0.4 to 0.8 m deep. Based on an average thickness of 0.5 m, the total in-place volume was estimated at about 145 m^3 or 290 tonnes (based on an average density of 2 tonnes/m^3), which includes a 25% contingency. The COCs in this area are PHCs.

6.1.2 Area 2

The contamination in this area is generally confined to the fill soil. Chemical testing indicates the native soil meets the applicable SCS and contamination does not extend vertically in the native soil. The dimensions of the Area 2 soil contamination were not fully delineated, since no clean limits were established in the northwestern portion of the Area. For the purposes of estimating a total area, the maximum extent of historical surficial granular fill, as shown on a 2005 aerial photograph was used, since the contamination is thought to be associated with this fill material.

The contamination covers an approximate plan area of 525 m^2 as shown on Drawing 4-1 and is about 0.4 to 1.7 m deep. Based on an average thickness of 0.9 m, the total in-place volume was estimated at about 625 m^3 or 1,250 tonnes (based on an average density of 2 tonnes/m^3), which includes a 25% contingency. The COC in this area is boron (HWS).

6.1.3 Area 3

The contamination in this area is generally confined to the fill soil. Chemical testing indicates the native soil meets the applicable SCS and contamination does not extend vertically in the native soil. The contamination covers an approximate plan area of 1,400 m^2 as shown on Drawing 4-1 and is about 0.3 to 1.4 m deep. Based on an average thickness of 0.7 m, the total in-place volume was estimated at about 1,200 m^3 or 2,400 tonnes (based on an average density of 2 tonnes/m^3), which includes a 25% contingency. The COCs in this area are PHCs, metals and boron (HWS).

6.1.4 Next Steps

With the exception of Area 2, the recommended remediation method for the areas of soil contamination at the Site is ex-situ remediation, or excavation and off-site disposal.

Regarding the topsoil stockpile, it is recommended that the stockpile be surveyed in order to determine an accurate quantity and once a possible ICC receiving site is found for this material a program of additional soil sampling and chemical testing be completed for the stockpiled material in accordance with the receiving site requirements.

Regarding Area 2, boron HWS contamination of surface soils, it is recommended that this area be remediated in order to meet the current T3 RPI SCSs, however soil with elevated boron HWS does not require landfill disposal. This soil may be re-used at the Site, provided it is placed below 1.5 m as subsurface soil. Alternatively the soil from this area may be re-used at another T3 RPI or ICC Site, provided it is placed below 1.5 m as subsurface soil.

The cost to remediate Area 2 can only be determined once a decision is taken as to whether the soil will be remediated in place or suitable receiving site is found and contractor pricing is solicited. If the decision is made that due to Site grading and/or temporal restrictions landfill disposal of the boron HWS soil is required, assuming a rate of about $65/tonne for non-hazardous waste cleanup cost, the estimated cost for excavation, transportation and landfill disposal of the soil identified in Area 2 (1,250 tonnes) is projected to be in the order of **$81,250.00**.

Regarding, Areas 1 and 3, it is recommended that this area be remediated in order to meet the current T3 RPI SCSs and that contaminated soil be disposed of to a landfill.

The total estimated mass of contaminated fill/soil at the Site is 2,690 tonnes. Assuming a rate of about $65/tonne for non-hazardous waste cleanup cost, the estimated cost for excavation, transportation and landfill disposal of the soil identified in Area 1 and 3 is projected to be in the order of **$174,850.00**.

It is important to note that for the purposes of the full depth site cleanup, as compared with the Standards, the limits of the contaminated area were assumed to extend from an impacted soil sampling location to the next soil sampling location that was 'clean'., or as noted above, the assumed extent of historical surficial granular fill. The subsurface conditions between the 'clean' limits may vary.

It is important to note that:

i) The above noted Site cleanup quantity and cost estimate is based on an estimated in-place volume/tonnage of impacted soils inferred from the Site information and data available to date. The actual Site cleanup cost may be different pending the complete Site conditions revealed during Site cleanup operations in the field and confirmatory sampling and testing.

ii) The projected costs do not include backfilling, surface restoration, site fencing and engineering services associated with the clean-up activities.

iii) The projected costs do not include engineering, inspection, testing and review services associated with the Site cleanup activities and confirmatory sampling and testing that will be required during construction.

Cognizant of the above conclusions, the next steps will generally involve the following five tasks:

- Selection of a licensed environmental contractor and acceptable landfill disposal facility by the client with the assistance of PML (if required). Once the landfill is selected, perform toxicity characteristic leaching procedure testing (TCLP) on the required number of representative samples in order to comply with landfill certificate of approval (C of A) requirements.
- Completion of a program of soil remediation and confirmatory sampling and testing to remove contaminated fill material to an appropriate disposal facility under the direction of PML.
- Preparation of a final site cleanup report by PML verifying the contaminated soil/fill has been removed and the site has been restored to a condition suitable for the intended land use.

It should also be noted that there is no legal requirement to remove or treat the soil that exceeds the Standards applicable to the Site provided it is demonstrated that there is no off Site impact or adverse effect. However, if contaminated soil is left on Site, the landowner assumes liability associated with the Site contamination. The liability concerns could include potential scrutiny from the MOE and the public, as well as concerns on the part of financiers, insurers, future owners and owners of neighbouring properties.

The assignment is subject to the Statement of Limitations that is included in Appendix C and must be read in conjunction with this report.

Soil and ground water conditions between and beyond the sampled locations may differ from those encountered during this assignment. PML should be contacted if impacted soil conditions become apparent during future development to further access and appropriately handle the materials, if any, and evaluate whether modifications to the conclusions documented in this report are necessary.

6.2 Signatures

This report was completed by, David Smith, BSc. who has been trained to conduct Phase One and Two ESAs in accordance with O. Reg. 153/04, as amended. Mr. Smith is an environmental geoscience technologist with twelve years experience specializing in Phase One and Two ESAs, site remediation, ground water and soil sampling, excavation monitoring, underground and aboveground storage tank removals and preparation of Records of Site Condition. Mr. Smith has completed numerous Phase One and Two ESAs for commercial, industrial, and residential clients for a wide variety of project types (industrial complexes, commercial developments, entertainment and institutional buildings, and residential development).

The preparation of this report was supervised by, and the final report reviewed by, Mahaboob Alam, MSc., PhD., P.Geo., a Professional Geoscientist registered with the Association of Professional Geoscientists of Ontario. Mr. Alam is Manager of Geoenvironmental Services in PML's Toronto branch office and is a Qualified Person (QP) registered with the MOE. He has over 29 years of interdisciplinary professional experience specializing in geoenvironmental and hydrogeologic investigations and project management. His main areas of expertise include Phase I and Phase II ESAs, site cleanup/remediation planning and supervision, waste management, UST and AST removals, site remediation, Risk Assessment, Records of Site Condition and hydrogeologic investigations. He has completed hundreds of Phase I ESAs for commercial, industrial, and residential clients for a wide variety of project types (industrial complexes, commercial developments, entertainment and institutional buildings, and residential development).

Peto MacCallum Ltd. was established in 1973 as a result of the merger of Peto Associates Ltd., founded in 1956, and the Ontario division of Racey MacCallum and Associates Limited, chartered in 1952. Peto MacCallum Ltd. is a consulting engineering firm that specializes in the fields of geoenvironmental, hydrogeological and geotechnical engineering, building sciences, construction supervision/inspection and materials engineering/testing. Personnel in our four branch offices form a network of full time dedicated environmental professionals.

We trust the information presented in this report is sufficient for your present purposes. If you have any questions, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

David Smith, BSc.
Project Supervisor, Geoenvironmental Services



Mahaboob Alam, MSc, PhD, P.Geo.
Associate
Manager, Geoenvironmental and Hydrogeological Services

DS:lad

TABLE 1

Summary of Samples Submitted for Chemical Testing

Location	Sample ID	Approx. Depth (m)	Description	Type of Chemical Analysis
Area 1 Test Pit 101	TP101 GS1	0.0 – 0.8	**FILL:** Dark brown, sand and gravel fill, occasional asphalt fragments	PHC Fractions F1 to F4
Area 1 Test Pit 102	TP102 GS1	0.0 – 0.5	**FILL:** Brown, sand fill, trace gravel, some clay, occasional clay pipe and concrete fragments and roots	PHC Fractions F1 to F4
Area 1 Test Pit 103	TP103 GS1	0.0 – 0.4	**TOPSOIL:** Brown, silty sand topsoil, numerous rootets, surficial metal fragments	PHC Fractions F1 to F4
Area 1 Test Pit 103	TP103 GS2	0.4 – 0.9	**SILT TILL:** Brown, clayey silt till, occasional red and grey shale fragments	PHC Fractions F1 to F4
Area 1 Test Pit 103	DUPLICATE C (TP103 GS2)	0.4 – 0.9	**SILT TILL:** Brown, clayey silt till, occasional red and grey shale fragments	PHC Fractions F1 to F4
Area 1 Test Pit 104	TP104 GS1	0.0 – 0.5	**TOPSOIL:** Brown, silty clay topsoil, trace sand	PHC Fractions F1 to F4
Area 1 Test Pit 105	TP105 GS1	0.0 – 0.6	**FILL:** Brown, silty sand fill, trace gravel, numerous red brick fragments, occasional rootlets	PHC Fractions F1 to F4
Area 1 Test Pit 106	TP106 GS1	0.0 – 0.5	**FILL:** Brown, silty sand fill, some gravel, numerous metal, asphalt, red brick, concrete and plastic fragments	PHC Fractions F1 to F4
Area 1 Test Pit 107	TP107 GS1	0.0 – 0.4	**FILL:** Brown, clayey silt fill, trace sand and gravel, surficial asphalt	PHC Fractions F1 to F4
Area 1 Test Pit 107	TP107 GS2	0.4 – 0.7	**SILT TILL:** Brown, clayey silt till, occasional red and grey shale fragments	PHC Fractions F1 to F4

TABLE 1

Summary of Samples Submitted for Chemical Testing

Location	Sample ID	Approx. Depth (m)	Description	Type of Chemical Analysis
Area 1 Test Pit 108	TP108 GS1	0.0 – 0.4	**FILL:** Brown, silty sand, numerous asphalt fragments, surficial crushed asphalt	PHC Fractions F1 to F4
Area 2 Test Pit 109	TP109 GS2	0.2 – 0.7	**FILL:** Black sand and gravel fill, numerous pieces of asphalt and concrete	Boron (HWS)
Area 2 Test Pit 109	TP109 GS3	0.7 – 0.9	**SILT TILL:** Reddish brown, clayey silt till, moist	Boron (HWS)
Area 2 Test Pit 109	DUPLICATE D (TP109 GS3)	0.7 – 0.9	**SILT TILL:** Reddish brown, clayey silt till, moist	Boron (HWS)
Area 2 Test Pit 110	TP110 GS1	0.0 – 0.9	**TOPSOIL:** Brown, silty sand topsoil, trace cobble	Boron (HWS)
Area 2 Test Pit 111	TP111 GS2	0.2 – 0.7	**FILL:** Black sand and gravel fill, trace cobble, numerous wood pieces	Boron (HWS)
Area 2 Test Pit 112	TP112 GS1	0.0 – 0.4	**TOPSOIL:** Brown, silty sand topsoil	Boron (HWS)
Area 2 Test Pit 112	TP112 GS2	0.4 – 1.0	**SILT TILL:** Brown to reddish brown, clayey silt till, occasional red shale fragments and roots	Boron (HWS)
Area 2 Test Pit 113	TP113 GS1	0.0 – 0.4	**TOPSOIL:** Brown, sandy silt topsoil, surficial glass fragments	Boron (HWS)
Area 2 Test Pit 113	TP113 GS2	0.4 – 1.0	**SILT TILL:** Brown to reddish brown, clayey silt till, occasional red shale fragments	Boron (HWS)
Area 2 Test Pit 114	TP114 GS2	0.2 – 0.5	**FILL:** Brown, sand and gravel fill	Boron (HWS)

TABLE 1

Summary of Samples Submitted for Chemical Testing

Location	Sample ID	Approx. Depth (m)	Description	Type of Chemical Analysis
Area 2 Test Pit 115	TP115 GS1	0.0 – 0.1	**TOPSOIL:** Brown sandy silt topsoil	Boron (HWS)
Area 2 Test Pit 116	TP116 GS1	0.0 – 0.6	**TOPSOIL:** Brown sandy silt topsoil	Boron (HWS)
Area 3 Test Pit 118	TP118 GS1	0.0 – 0.6	**FILL:** Brown, clayey silt fill, trace sand and gravel	Boron (HWS) PHC Fractions F1 to F4
Area 3 Test Pit 118	TP118 GS2	0.6 – 1.1	**SILT TILL:** Reddish brown, clayey silt till, occasional red shale fragments	Metals PHC Fractions F1 to F4
Area 3 Test Pit 118	DUPLICATE B (TP118 GS2)	0.6 – 1.1	**SILT TILL:** Reddish brown, clayey silt till, occasional red shale fragments	PHC Fractions F1 to F4
Area 3 Test Pit 119	TP119 GS1	0.0 – 0.4	**TOPSOIL:** Brown, sand topsoil, some gravel, occasional roots	Boron (HWS)
Area 3 Test Pit 120	TP120 GS1	0.0 – 0.4	**TOPSOIL:** Brown, sand topsoil, some gravel, occasional roots	Metals Boron (HWS) PHC Fractions F1 to F4
Area 3 Test Pit 120	TP120 GS2	0.4 – 1.1	**SILT TILL:** Brown, silt till, trace sand and gravel	Metals PHC Fractions F1 to F4
Area 3 Test Pit 120	DUPLICATE A (TP120 GS2)	0.4 – 1.1	**SILT TILL:** Brown, silt till, trace sand and gravel	Metals PHC Fractions F1 to F4
Area 3 Test Pit 121	TP121 GS2	0.1 – 0.4	**FILL:** Blackish brown sand and gravel fill, numerous asphalt fragments	Boron (HWS)

TABLE 1

Summary of Samples Submitted for Chemical Testing

Location	Sample ID	Approx. Depth (m)	Description	Type of Chemical Analysis
Area 3 Test Pit 122	TP122 GS1	0.0 – 0.7	**FILL:** Grey and brown, sand and gravel fill, occasional asphalt fragments	Metals Boron (HWS) PHC Fractions F1 to F4
Area 3 Test Pit 122	TP122 GS2	0.7 – 1.3	**SILT TILL:** Grey, clayey silt till, black organic staining, occasional red shale fragments	Metals PHC Fractions F1 to F4
Area 3 Test Pit 123	TP123 GS3	0.3 – 0.8	**FILL:** Grey silty clay fill, trace gravel	Metals PHC Fractions F1 to F4
Area 3 Test Pit 125	TP125 GS2	0.1 – 0.6	**FILL:** Brown sand and gravel	Boron (HWS)
Area 3 Test Pit 126	TP126 GS2	0.1 – 0.3	**FILL:** Brown, silty sand, trace gravel	Metals Boron (HWS) PHC Fractions F1 to F4
Area 3 Test Pit 127	TP127 GS1	0.0 – 0.2	**FILL:** Dark brown, organic sand fill, trace gravel, occasional roots	Boron (HWS)
Area 3 Test Pit 128	TP128 GS2	0.2 – 0.6	**FILL:** Brown, silty sand fill, some gravel, occasional asphalt fragments	Metals PHC Fractions F1 to F4
Area 3 Test Pit 128	TP128 GS3	0.6 – 1.2	**SILT TILL:** Dark brown, clayey silt till, black organic staining	Metals PHC Fractions F1 to F4
Area 3 Test Pit 129	TP129 GS2	0.2 – 0.4	**FILL:** Light grey, silty sand fill, trace gravel	Metals PHC Fractions F1 to F4
Area 3 Test Pit 129	TP129 GS4	1.0 – 1.5	**SILT TILL:** Dark brown to black, clayey silt till, black organic staining, occasional red and grey shale fragments	Metals PHC Fractions F1 to F4

TABLE 1

Summary of Samples Submitted for Chemical Testing

Location	Sample ID	Approx. Depth (m)	Description	Type of Chemical Analysis
Area 3 Test Pit 130	TP130 GS1	0.0 – 0.2	**FILL:** Dark brown, organic silt, trace sand and clay, occasional roots and red brick fragments	Metals PHC Fractions F1 to F4
Area 3 Test Pit 131	TP131 GS2	0.1 – 0.2	**FILL:** Reddish brown, clayey silt fill, trace gravel	Metals PHC Fractions F1 to F4
Area 3 Test Pit 131	TP131 GS5	0.5 – 1.1	**CLAY TILL:** Grey, silty clay till, occasional red and grey shale fragments	Metals PHC Fractions F1 to F4
Topsoil Stockpile	STOCKPILE GS1	-	**TOPSOIL:** Brown sandy silt topsoil	Electrical Conductivity
Topsoil Stockpile	DUPLICATE E (STOCKPILE GS1)	-	**TOPSOIL:** Brown sandy silt topsoil	Electrical Conductivity
Topsoil Stockpile	STOCKPILE GS2	-	**TOPSOIL:** Brown sandy silt topsoil	Electrical Conductivity
Topsoil Stockpile	STOCKPILE GS3	-	**TOPSOIL:** Brown sandy silt topsoil	Electrical Conductivity

Note:
PHC – Petroleum Hydrocarbon
HWS – Hot Water Soluble

LIST OF ABBREVIATIONS

PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: - The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

CONSISTENCY	N (blows/0.3 m)	c (kPa)	DENSENESS	N (blows/0.3 m)
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		

WTPL	Wetter Than Plastic Limit
APL	About Plastic Limit
DTPL	Drier Than Plastic Limit

TYPE OF SAMPLE

SS	Split Spoon	TW	Thinwall Open
WS	Washed Sample	TP	Thinwall Piston
SB	Scraper Bucket Sample	OS	Oesterberg Sample
AS	Auger Sample	FS	Foil Sample
CS	Chunk Sample	RC	Rock Core
ST	Slotted Tube Sample		
	PH Sample Advanced Hydraulically		
	PM Sample Advanced Manually		

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 101

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.5	**Ground Surface**									
0.0	FILL: Dark brown, sand and gravel fill, occasional asphalt fragments, moist		1*	GS		99			0	
98.7										
0.8	CLAY TILL: Grey, silty clay till, occasional red shale fragments, DTPL		2	GS					5	
98.3										
1.2	TEST PIT TERMINATED AT 1.2 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7 ,×5 : Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 102

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.5	**Ground Surface**									
0.0	FILL: Brown, sand fill, trace gravel, some clay, occasional clay pipe and concrete fragments and roots, APL		1*	GS					20	
99.0						99				
0.5	SILT TILL: Brown to light brown, clayey silt till, trace gravel, moist		2	GS					20	
98.6										
0.9	TEST PIT TERMINATED AT 0.9 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

SHEAR STRENGTH kPa: 50 100 150 200
WATER CONTENT (%): 10 20 30 40
SHEAR STRENGTH kPa: 20 40 60 80

1.0
2.0
3.0
4.0
5.0

+7, ×5 : Numbers refer to Sensitivity

20
15 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 103

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER; 50 100 150 200) / DYNAMIC CONE PENETRATION STANDARD PENETRATION TEST (× ●; 20 40 60 80)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30 40)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.5	**Ground Surface**									
0.0	TOPSOIL: Brown, silty sand topsoil, numerous rootlets, surficial metal fragments, moist		1*	GS					10	
99.1										
0.4	SILT TILL: Brown, clayey silt till, occasional red and grey shale fragments, moist		2*	GS		99			10	
98.6										
0.9	TEST PIT TERMINATED AT 0.9 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing
1.0										
2.0										
3.0										
4.0										
5.0										

+, ×: Numbers refer to Sensitivity

(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 104

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
OUR PROJECT NO. 13HX002
LOCATION Stonehaven Drive, Burlington, Ontario
BORING DATE June 18, 2013
ENGINEER M. Alam
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.5	**Ground Surface**									
0.0 / 99.0	TOPSOIL: Brown, silty clay topsoil, trace sand, WTPL		1*	GS		99			5	
0.5 / 98.5	SILT TILL: Reddish brown, clayey silt till, moist		2	GS					5	
1.0	TEST PIT TERMINATED AT 1.0 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 105

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.5	**Ground Surface**									
0.0	FILL: Brown, silty sand fill, trace gravel, numerous red brick fragments, occasional rootlets, moist		1*	GS		99			5	
98.9										
0.6	SILT TILL: Brown, clayey silt till, trace sand and gravel, moist		2	GS					0	
98.6										
0.9	TEST PIT TERMINATED AT 0.9 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 106

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.5	**Ground Surface**									
0.0 / 99.0	FILL: Brown, silty sand fill, some gravel, numerous metal, asphalt, red brick, concrete and plastic fragments, moist		1*	GS					0	
0.5 / 98.5	SILT TILL: Brown, clayey silt till, occasional red shale fragments, DTPL		2	GS		99			0	
1.0	TEST PIT TERMINATED AT 1.0 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 107

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING OATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER; 50 100 150 200) / DYNAMIC CONE PENETRATION, STANDARD PENETRATION TEST (× ●; 20 40 60 80)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30 40)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL.
99.5	**Ground Surface**									
0.0	FILL: Brown, clayey silt fill, trace sand and gravel, surficial asphalt fragments, moist		1*	GS					0	
99.1										
0.4	SILT TILL: Brown, clayey silt till, occasional red and grey shale fragments, DTPL		2*	GS		99			0	
98.8										
0.7	TEST PIT TERMINATED AT 0.7 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5 : Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 108

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER, DYNAMIC CONE PENETRATION ×, STANDARD PENETRATION TEST ●) 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL.
99.5	**Ground Surface**									
0.0 / 99.1	FILL: Brown, silty sand, numerous asphalt fragments, surficial crushed asphalt, moist		1*	GS					0	
0.4 / 98.7	ORGANIC CLAY: Grey and black, organic silty clay, WTPL		2	GS		99			0	
0.8	TEST PIT TERMINATED AT 0.8 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:24:42 AM

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 109

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
OUR PROJECT NO. 13HX002
LOCATION Stonehaven Drive, Burlington, Ontario
BORING DATE June 18, 2013
ENGINEER M. Alam
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	ORGANIC SILT: Brown, organic sandy silt, trace clay, occasional roots, moist		1	GS					0	
0.2	becoming black sand and gravel fill, numerous pieces of asphalt and concrete, moist		2*	GS		99			15	
98.6										
0.7	SILT TILL: Reddish brown, clayey silt till, moist		3*	GS					0	
98.4										
0.9	TEST PIT TERMINATED AT 0.9 m									Upon completion of test pit, no water seepage, no cave
										* Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:24:43 AM

+7, ×5: Numbers refer to Sensitivity

20
15 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 110

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER; 50 100 150 200) / DYNAMIC CONE PENETRATION STANDARD PENETRATION TEST (× ●; 20 40 60 80)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30 40)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	TOPSOIL: Brown, silty sand topsoil, trace cobble, moist		1*	GS		99			0	
98.4										
0.9	SILT TILL: Brown, clayey silt till, occasional red shale fragments, DTPL		2	GS					35	
98.2										
1.1	TEST PIT TERMINATED AT 0.9 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 111

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	FILL: Brown, organic sandy silt fill, trace clay, occasional roots, moist		1	GS					0	
0.2	becoming black sand and gravel fill, trace cobble, numerous wood pieces, moist		2*	GS		99			0	
98.6										
0.7	SILT TILL: Grey, clayey silt till, moist		3*	GS					0	
98.5										
0.8	TEST PIT TERMINATED AT 0.8 m									Upon completion of test pit, no water seepage, no cave
1.0										* Sample submitted for chemical testing
2.0										
3.0										
4.0										
5.0										

SHEAR STRENGTH kPa: 50 100 150 200
DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST: 20 40 60 80
WATER CONTENT (%): 10 20 30 40

+7, ×5; Numbers refer to Sensitivity

20
15 5
10

(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 112

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J

BORING DATE June 18, 2013

OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER; 50 100 150 200; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×/●; 20 40 60 80)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	TOPSOIL: Brown, silty sand topsoil, moist		1*	GS		99			0	
98.9										
0.4	SILT TILL: Brown to reddish brown, clayey silt till, occasional red shale fragments and roots, DTPL		2*	GS					0	
98.3										
1.0	TEST PIT TERMINATED AT 1.0 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:24:47 AM

+7, ×5: Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 113

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	TOPSOIL: Brown, sandy silt topsoil, surficial glass fragments, moist		1*	GS		99			0	
98.9										
0.4	SILT TILL: Brown to reddish brown, clayey silt till, occasional red shale fragments, DTPL		2*	GS					0	
98.3										
1.0	TEST PIT TERMINATED AT 1.0 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 114

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×/●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	FILL: Brown, silty sand fill, moist		1	GS					10	
0.2	becoming brown sand and gravel fill, moist		2*	GS		99			5	
98.8										
0.5	SILT TILL: Brown, clayey silt till, occasional red shale fragments, DTPL		3*	GS					0	
97.8						98				
1.6	TEST PIT TERMINATED AT 1.6 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7 ,×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 115

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J

BORING DATE June 18, 2013

OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	TOPSOIL: Brown sandy silt topsoil, moist		1*	GS					0	
0.1	SILT TILL: Brown, clayey silt till, occasional red shale fragments, DTPL					99				
			2	GS					0	
98.5										
0.8	TEST PIT TERMINATED AT 0.8 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 OS.GPJ ON_MOT.GOT 14/08/2013 11:24:51 AM

+7, ×5 : Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 116

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×/●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.3	**Ground Surface**									
0.0	TOPSOIL: Brown sandy silt topsoil, moist		1*	GS		99			0	
98.7										
0.6	SILT TILL: Brown, clayey silt till, occasional red shale fragments, DTPL		2	GS					0	
98.5										
0.8	TEST PIT TERMINATED AT 0.8 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 117

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; 50 100 150 200; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.6	**Ground Surface**									
0.0	TOPSOIL: Brown sand topsoil, trace gravel, moist		1	GS					5	
98.2										
0.4	SILT TILL: Grey, clayey silt till, trace sand and gravel, occasional red shale fragments, DTPL		2	GS		98			0	
1.0										
97.4										
1.2	TEST PIT TERMINATED AT 1.2 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing
2.0										
3.0										
4.0										
5.0										

+ , × : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 118

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.6	**Ground Surface**									
0.0	FILL: Brown, clayey silt fill, trace sand and gravel, DTPL		1*	GS						
98.0										
0.6	SILT TILL: Reddish brown, clayey silt till, occasional red shale fragments, DTPL		2*	GS		98			0	
1.0										
97.5										
1.1	TEST PIT TERMINATED AT 1.1 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing
2.0										
3.0										
4.0										
5.0										

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 119

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
OUR PROJECT NO. 13HX002
LOCATION Stonehaven Drive, Burlington, Ontario
BORING DATE June 18, 2013
ENGINEER M. Alam
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.6	**Ground Surface**									
0.0	TOPSOIL: Brown, sand topsoil, some gravel, occasional roots, moist		1	GS					0	
98.2										
0.4	SILT TILL: Brown, silt till, trace sand and gravel, moist		2	GS		98			0	
97.7										
0.9	TEST PIT TERMINATED AT 0.9 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:24:57 AM

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 120

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J

BORING DATE June 18, 2013

OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.6	**Ground Surface**									
0.0	TOPSOIL: Brown, sand topsoil, some gravel, occasional roots, moist		1*	GS					0	
98.2										
0.4	SILT TILL: Brown, silt till, trace sand and gravel, moist		2*	GS		98			0	
97.5										
1.1	TEST PIT TERMINATED AT 1.1 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 121

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

SOIL PROFILE			SAMPLES			ELEVATION SCALE	SHEAR STRENGTH kPa (O UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		50 100 150 200 / 20 40 60 80	10 20 30 40	ppm	GR SA SI CL
99.0 **Ground Surface**										
0.0	FILL: Brown, organic clayey silt, WTPL		1	GS					0	
0.1	becoming blackish brown sand and gravel fill, numerous asphalt fragments, moist		2*	GS					0	
98.6 0.4	SILT TILL: Brown, clayey silt till, occasional red shale fragments, DTPL; surficial debris including plastic and brick fragments		3	GS		98			0	
97.7 1.4	TEST PIT TERMINATED AT 1.4 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0 2.0 3.0 4.0 5.0

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 122

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J

OUR PROJECT NO. 13HX002
BORING DATE June 18, 2013
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.0	**Ground Surface**						50 100 150 200 / 20 40 60 80	10 20 30 40		
0.0	FILL: Grey and brown, sand and gravel fill, occasional asphalt fragments, moist		1*	GS					0	
98.3										
0.7	SILT TILL: Grey, clayey silt till, black organic staining, occasional red shale fragments, DTPL		2*	GS		98			10	
97.7										
1.3	TEST PIT TERMINATED AT 1.3 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5 : Numbers refer to Sensitivity

20
15 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 123

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.0	**Ground Surface**									
0.0	FILL: Brown, sand and gravel fill, occasional asphalt fragments, moist		1	GS					0	
0.2 / 98.7	100 mm layer of asphalt		2	GS						
0.3	becoming grey silty clay fill, trace gravel, DTPL		3*	GS					0	
98.2										
0.8	becoming reddish brown clayey silt fill, DTPL		4	GS					0	
1.0 97.9						98				
1.1	CLAY TILL: Gray silty clay till, black organic staining, occasional red shale fragments, DTPL		5	GS					0	
97.7										
1.3	TEST PIT TERMINATED AT 1.4 m									Upon completion of test pit, no water seepage, no cave
2.0										* Sample submitted for chemical testing
3.0										
4.0										
5.0										

+, ×: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 124

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●) 20 40 60 80	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.7	**Ground Surface**									
0.0	TOPSOIL: Brown, silty clay topsoil, occasional roots, WTPL		1	GS					5	
0.2	SILT TILL: Brown, silt till, trace sand and gravel, moist		2	GS		98			0	
97.6										
1.1	becoming grey		3	SS					5	
97.4										
1.3	TEST PIT TERMINATED AT 1.3 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:26:04 AM

Numbers refer to Sensitivity

(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 125

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER; 50 100 150 200; DYNAMIC CONE PENETRATION ×, STANDARD PENETRATION TEST ●; 20 40 60 80)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.7	**Ground Surface**									
0.0	FILL: Dark brown, organic sand fill, trace gravel, occasional roots, moist		1	GS					10	
0.1	becoming brown sand and gravel, moist		2*	GS					0	
98.1										
0.6	becoming reddish brown, clayey silt fill, WTPL; metal pipe section at 0.76 m		3	GS		98			0	
97.5										
1.2	TEST PIT TERMINATED AT 1.2 m									Upon completion of test pit, perched water at 1.02m, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 126

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×) 20 40 60 80 / 50 100 150 200	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.7	**Ground Surface**									
0.0	FILL: Dark brown, organic clayey silt fill, moist		1	GS					0	
0.1	becoming brown, silty sand, trace gravel, moist		2*	GS					0	
98.4 0.3	becoming reddish brown clay fill, DTPL		3	GS					0	
98.1 0.6	CLAY TILL: Grey silty clay till, black organic staining, DTPL		4	GS		98			10	
97.3 1.4	TEST PIT TERMINATED AT 1.4 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:25:07 AM

+, ×: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 127

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER; 50 100 150 200; DYNAMIC CONE PENETRATION ×, STANDARD PENETRATION TEST ●; 20 40 60 80)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.7	**Ground Surface**									
0.0	FILL: Dark brown, organic sand fill, trace gravel, occasional roots, moist		1	GS					0	
0.2	becoming brown, sand fill, trace silt, clay and gravel, occasional asphalt fragments, moist		2	GS					0	
98.4 0.3	becoming reddish brown clayey silt fill, DTPL		3	GS		98			0	
97.8 0.9	CLAY TILL: Grey silty clay till, black organic staining, DTPL		4	GS					0	
97.2										
97.2 1.5	SILT TILL: Reddish brown, clayey silt till, DTPL		5	GS					0	Upon completion of test pit, no water seepage, no cave
	TEST PIT TERMINATED AT 1.5 m									* Sample submitted for chemical testing

1.0 2.0 3.0 4.0 5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:25:09 AM

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 128

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×/●) 50 100 150 200 / 20 40 60 80	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.0	**Ground Surface**									
0.0	FILL: Dark brown, organic sandy silt fill, trace gravel, occasional roots, moist		1	GS					0	
0.2	becoming brown, silty sand fill, some gravel, occasional asphalt fragments, moist		2*	GS					0	
98.4										
0.6	SILT TILL: Dark brown, clayey silt till, black organic staining, DTPL		3*	GS		98				
1.0										
97.8										
1.2	TEST PIT TERMINATED AT 1.2 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing
2.0										
3.0										
4.0										
5.0										

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 129

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE, ▲ POCKET PENETROMETER, DYNAMIC CONE PENETRATION ×, STANDARD PENETRATION TEST ●)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
98.7	**Ground Surface**						50 100 150 200 / 20 40 60 80	10 20 30 40		
0.0	FILL: Dark brown, organic sand fill, trace gravel, occasional roots, moist		1	GS					15	
0.2 / 98.3	becoming light grey, silty sand fill, trace gravel, moist		2*	GS					0	
0.4	becoming reddish brown, silty clay		3	GS		98			20	
1.0 / 97.7	SILT TILL: Dark brown to black, clayey silt till, black organic staining, occasional red and grey shale fragments, DTPL		4*	SS					0	
97.2 / 1.5	TEST PIT TERMINATED AT 1.5 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:25:15 AM

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 130

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J

BORING DATE June 18, 2013

OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.1	**Ground Surface**									
0.0	FILL: Dark brown, organic silt, trace sand and clay, occasional roots and red brick fragments, moist		1*	GS		99			5	
0.2	becoming brown, silty sand fill, moist		2	GS					15	
98.6										
0.5	SILT TILL: Reddish brown, silt till, some clay, trace sand and gravel, DTPL		3	GS					10	
98.0						98				
1.1	TEST PIT TERMINATED AT 1.1 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

SHEAR STRENGTH kPa: 50 100 150 200
DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST: 20 40 60 80
WATER CONTENT (%): 10 20 30 40

1.0
2.0
3.0
4.0
5.0

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 131

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST ×/●) 20 40 60 80	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) 10 20 30 40	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.1 / 0.0	**Ground Surface**									
0.0	GRANULAR: 100 mm mixed coarse crushed limestone and crushed asphalt		1	GS		99			15	
0.1	FILL: Reddish brown, clayey silt fill, trace gravel, moist		2*	GS					30	
0.2 / 98.7	becoming orangey brown, sand fill, some silt, occasional asphalt fragments, moist		3	GS					0	
0.4 / 98.6	ASPHALT: 100 mm layer of asphalt		4	GS						
0.5	CLAY TILL: Grey, silty clay till, occasional red and grey shale fragments, DTPL		5*	GS					0	
1.0 / 98.0										
1.1	SILT TILL: Brown, silt till, moist		6	GS		98			0	
97.7 / 1.4	TEST PIT TERMINATED AT 1.4 m									Upon completion of test pit, no water seepage, no cave
2.0										* Sample submitted for chemical testing
3.0										
4.0										
5.0										

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF TEST PIT NO. 132

METRIC

1 of 1

PROJECT Halton District School Board Surplus Land
LOCATION Stonehaven Drive, Burlington, Ontario
EXCAVATION METHOD John Deere Rubber Tire Backhoe 410 J
BORING DATE June 18, 2013
OUR PROJECT NO. 13HX002
ENGINEER M. Alam
TECHNICIAN S. Murray

ELEV / DEPTH in meters	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE; ▲ POCKET PENETROMETER; DYNAMIC CONE PENETRATION STANDARD PENETRATION TEST ×)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	GAS READINGS ppm	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
99.1	**Ground Surface**									
0.0	FILL: Dark brown, organic silt fill, moist		1	GS		99			5	
0.2	becoming light brown, sand, trace silt, moist		2	GS					10	
0.3	becoming reddish brown, silt fill, trace clay and gravel, occasional red brick fragments, moist		3	GS					5	
98.3										
0.8	SILT TILL: Reddish brown, silt till, trace gravel, DTPL		4	GS		98			0	
97.8										
1.3	TEST PIT TERMINATED AT 1.3 m									Upon completion of test pit, no water seepage, no cave * Sample submitted for chemical testing

SHEAR STRENGTH kPa: 50 100 150 200
DYNAMIC CONE PENETRATION / STANDARD PENETRATION TEST: 20 40 60 80
WATER CONTENT (%): 10 20 30 40

1.0
2.0
3.0
4.0
5.0

PML - TP LOG ENV 13HX002 DELINEATION TP LOGS 2013-07-12 DS.GPJ ON_MOT.GDT 14/08/2013 11:25:20 AM

+7, ×5: Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

TP 101 EL. 99.5
TP 102 EL. 99.5
TP 9
TP 106 EL. 99.5
TP 104 EL. 99.5
BH 111 EL. 99.5
SA-6
TP 107 EL. 99.5
TP 103 EL. 99.5
TP 105 EL. 99.5
TP 108 EL. 99.5
SA-5
TP 10
TP 10-A
BH/MW 102 EL. 99.4
TP 8
TP 12
TP 13
TP 109 EL. 99.3
TP 111 EL. 99.3
TP 113 EL. 99.3
TP 14-B
TP 14-A
TP 14
TP 115 EL. 99.3
TP 110 EL. 99.3
BH/MW 103 EL. 99.3
TP 114 EL. 99.3
TP 116 EL. 99.3
TP 112 EL. 99.3
TP 6
TP 7
TP 5
BH 105 EL. 99.1
TP 4
TP 130 EL. 99.1
TP 131 EL. 99.1
TP 132 EL. 99.1
BH 104 EL. 99.0
TP 128 EL. 99.0
TP 121 EL. 99.0
TP 122 EL. 99.0
BH 113 EL. 98.8
SA-4
TP 117 EL. 98.6
TP 125 EL. 98.7
TP 123 EL. 99.0
TP 1
TP 118 EL. 98.6
TP 2-N1
TP 2-W2
TP 2-W1
BH 112 EL. 98.9
SA-3
TP 2
BH/MW 101 EL. 98.7
SA-2
TP 2-E1
TP 2-W3
BH 106 EL. 98.7
TP 2-S1
TP 126 EL. 98.7
TP 119 EL. 98.6
TP 124 EL. 98.7
TP 120 EL. 98.6
TP 127 EL. 98.7
TP 129 EL. 98.7
BH 107 EL. 98.8
TP 3-N1
TP 3-W1
TP 3-W2
TP 3
TP 3-E1
BH 110 EL. 99.1
SA-1
TP 3-S1

TOPSOIL STOCKPILE

STOCKPILE GS1
STOCKPILE GS2
STOCKPILE GS3
TP 11
TP 11-A
GS1

APPROXIMATE EXTENT OF VISIBLE SURFICIAL GRANULAR

CLEAN UP AREA 1
ESTIMATED AREA = 225 m^2
ESTIMATED VOLUME = 145 m^3
ESTIMATED MASS = 290 tonnes

CLEAN UP AREA 2
ESTIMATED AREA = 525 m^2
ESTIMATED VOLUME = 625 m^3
ESTIMATED MASS = 1,250 tonnes

CLEAN UP AREA 3
ESTIMATED AREA = 1,400m^2
ESTIMATED VOLUME = 1,200 m^3
ESTIMATED MASS = 2,400 tonnes

SOIL SAMPLE:

TP9 GS1 0.0 – 0.4m — TOPSOIL FILL: GRASS AND ROOT MAT OVER BROWN SILTY TOPSOIL WITH TRACE PIECES OF RED BRICK, ASPHALT/SLAG, ROOTLETS

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	350	300

SOIL SAMPLE:

SA-6 0.0-0.3m

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	500	300
PHC FRACTION F4 (GRAVIMETRIC)	ug/g	7,500	--

SOIL SAMPLE:

TP103 GS1 0.0 – 0.4m — FILL: BROWN SILTY SAND TOPSOIL, NUMEROUS ROOTLETS, SURFICIAL METAL FRAGMENTS

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	500	300

SOIL SAMPLE:

TP111 GS2 0.2 – 0.7m — FILL: BLACK SAND AND GRAVEL FILL, TRACE COBBLE, NUMEROUS WOOD PIECES

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
BORON (HWS)	ug/g	1.68	1.5

SOIL SAMPLE:

TP109 GS2 0.2 – 0.7m — FILL: BLACK SAND AND GRAVEL FILL, NUMEROUS PIECES OF ASPHALT AND CONCRETE

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
BORON (HWS)	ug/g	6.86	1.5

SOIL SAMPLE:

TP14-B GS1 0.0 – 0.5m — FILL: BROWN/BLACK SAND AND GRAVEL FILL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
BORON (HWS)	ug/g	2.17	1.5

SOIL SAMPLE:

TP14 GS1 0.0 – 0.6m — FILL: BROWN SAND AND GRAVEL FILL, TRACE PIECES OF WOOD, TRACE RED BRICK AND METAL WIRE

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
BORON (HWS)	ug/g	5.65	1.5

SOIL SAMPLE:

TP14-A GS1 0.0 – 0.45m — FILL: BROWN/BLACK SAND AND GRAVEL FILL, TRACE PIECES OF WOOD, COBBLE

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
BORON (HWS)	ug/g	9.58	1.5

SOIL SAMPLE:

TP123 GS3 0.3 – 0.8m — FILL: GREY SILTY CLAY FILL, TRACE GRAVEL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	510	300

SOIL SAMPLE:

TP2 GS1 0.0 – 0.5m — FILL: BROWN CRUSHED GRAVEL AND SAND FILL WITH RED/BROWN CLAYEY SILT, TRACE PIECES OF ASPHALT, ORGANICS

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F2	ug/g	220	98
PHC FRACTION F3	ug/g	24,000	300
PHC FRACTION F4	ug/g	7,600	2,800

SOIL SAMPLE:

SA-4 0.0 – 0.3m

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
BORON (HWS)	ug/g	1.8	1.5

SOIL SAMPLE:

TP3 GS2 0.6-1.0m — FILL: BLACK GRAVEL WITH CLAYEY SILT

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F1	ug/g	68	55
PHC FRACTION F2	ug/g	370	98
PHC FRACTION F3	ug/g	3,300	300

SOIL SAMPLE:

TP2-W2 GS1 0.0 – 0.4m — FILL: BROWN CRUSHED GRAVEL AND SAND FILL WITH BROWN/BLACK CLAYEY SILT, TRACE PIECES OF ASPHALT

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F2	ug/g	1,300	98

SOIL SAMPLE:

BH 110 AS1 0.0 – 0.3m — FILL: BROWN SAND AND GRAVEL FILL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	500	300

SOIL SAMPLE:

BH 112 AS1 0.0 – 0.3m — FILL: BROWN SAND AND GRAVEL FILL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
CADMIUM	ug/g	1.6	1.2
PHC FRACTION F3	ug/g	2400	300

SOIL SAMPLE:

SA-3 0.0-0.3m

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	1,300	300
PHC FRACTION F4 (GRAVIMETRIC)	ug/g	9,700	--
CADMIUM	ug/g	1.4	1.2

SOIL SAMPLE:

TP2 -E1 GS1 0.0 – 0.2m — FILL: BROWN CRUSHED GRAVEL AND SAND FILL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F2	ug/g	1,000	98

SOIL SAMPLE:

TP126 GS2 0.1 – 0.3m — FILL: BROWN SILTY SAND FILL, TRACE GRAVEL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
ZINC	ug/g	342	340
CADMIUM	ug/g	1.4	1.6

SOIL SAMPLE:

SA-2 0.0-0.3m

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	390	300
PHC FRACTION F4 (GRAVIMETRIC)	ug/g	5,400	--
BORON (HWS)	ug/g	1.8	1.5

SOIL SAMPLE:

TP129 GS2 0.2 – 0.4m — FILL: LIGHT GREY SILTY SAND FILL, TRACE GRAVEL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
CADMIUM	ug/g	1.4	1.2
ZINC	ug/g	360	340

SOIL SAMPLE:

BH 107 SS1A 0.0 – 0.3m — FILL: BROWN SAND AND GRAVEL FILL

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
CADMIUM	ug/g	1.7	1.2

SOIL SAMPLE:

SA-1 0.0-0.3m

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
PHC FRACTION F3	ug/g	320	300
PHC FRACTION F4 (GRAVIMETRIC)	ug/g	5,000	--



KEY PLAN
BURLINGTON, ONTARIO

- SITE LIMITS
- TP 112 EL. 99.3 — PML DELINEATION TEST PIT (TP) LOCATIONS
- TG2 — PML GRAB SAMPLE (GP) LOCATIONS
- BH 105 EL. 99.1 — PML BOREHOLE (BH) LOCATIONS
- BH/MW 102 EL. 99.4 — PML BOREHOLE/MONITORING WELL (BH/MW) LOCATIONS
- TP 11 — PML 2006 TP LOCATIONS
- TP 11-A — PML 2006 TP LOCATIONS
- SA-5 — PML 2012 SAMPLE LOCATIONS BY OTHERS
- TEMPORARY BENCHMARK (TBM)
- APPROXIMATE LIMITS OF SOIL EXCEEDING THE TABLE 3 RPI SITE CONDITION STANDARDS
- APPROXIMATE LIMITS OF HISTORICAL EXTENT OF SURFICIAL GRANULAR FILL

SAMPLE WHERE SOIL QUALITY WAS ABOVE O. REG. 153/04, AS AMENDED, TABLE 3 STANDARDS

SAMPLE MEDIUM / SAMPLE ID / SAMPLE DEPTH / SAMPLE DESCRIPTION / ANALYTE

SOIL SAMPLE:

BH/MW2 AS1 0.3 – 0.8m — FILL: BROWN SAND FILL, TRACE ORGANICS

	UNITS	MEASURED VALUE	TABLE 3 (RPI) STANDARDS
MERCURY	ug/g	1.94	0.27

TEMPORARY BENCHMARK:

TOP OF TOP NUT OF FIRE HYDRANT EAST SIDE OF SITE, APPROX. 4 m WEST OF CHAIN LINK FENCE, APPROX. 3 m NORTHEAST OF SANITARY MANHOLE.
ASSIGNED ELEVATION: 100.0 m

REFERENCE:

PLAN PRODUCED FROM A GIS INFORMATION FROM THE CITY OF BURLINGTON ONLINE INTERACTIVE MAPPING SERVICE AND HISTORICAL AERIAL PHOTOGRAPHS.

NOTE:

1) THE INFERRED STRATIGRAPHY REFERRED TO IN THE REPORT IS BASED ON THE DATA FROM THESE BOREHOLES SUPPLEMENTED BY GEOLOGICAL EVIDENCE. THE ACTUAL STRATIGRAPHY BETWEEN THE BOREHOLES MAY VARY.
2) EXCEEDANCES SHOWN IN RED REPRESENT SAMPLES ANALYZED IN 2013, EXCEEDANCES SHOWN IN PINK REPRESENT SAMPLES ANALYZED IN 2012 BY OTHERS AND EXCEEDANCES SHOWN IN GREEN REPRESENT SAMPLES ANALYZED IN 2006

5 0m 5 10 15
SCALE

HALTON DISTRICT SCHOOL BOARD

ADDENDUM TO PHASE TWO ESA: DELINEATION
HDSB SURPLUS LANDS ON STONEHAVEN DRIVE
STONEHAVEN DRIVE, BURLINGTON, ONTARIO

DELINEATION SITE PLAN

Peto MacCallum Ltd.
CONSULTING ENGINEERS

		DATE	SCALE	PML REF.	DRAWING NO.
DRAWN	SM/DS	AUG. 2013	AS SHOWN	13HX002	4-1
CHECKED	DS				
APPROVED	MA				

Appendix A

Geoenvironmental Field Instructions / Sampling & Analysis Plan

Peto MacCallum Ltd.
CONSULTING ENGINEERS

SAMPLING AND ANALYSIS PLAN

PROJECT NO.	13HX002	DATE	June 11, 2013
PROJECT NAME	HDSB Surplus Land on Stonehaven Drive	PROJECT LOCATION	Stonehaven Drive, Burlington

NO. OF BH's/TEST PITS AND DEPTHS:

34 test pits excavated to a depth of 0.3 to 1.5 at the following locations:

- Eight (8) test pits for delineation of Area 1 soil contamination (0 – 0.4m depth);
- Eight (8) test pits for delineation of Area 2 soil contamination (0 – 0.6m depth);
- Sixteen (16) test pits for delineation of Area 3 contamination (0 – 1.0m depth); and
- Two (2) test pits for confirmation in the existing topsoil stockpile.

ENVIRONMENTAL SAMPLING: Grab samples

Soil Analysis
16 metals and Inorganics plus one duplicate.
24 PHC Fractions F1 to F4 plus two duplicates.
16 boron (HWS) plus one duplicate
3 electrical conductivity plus one duplicate

Take headspace readings on all recovered soil samples.

OTHER:

UNDERGROUND SERVICES:

See the locate sheets.

STARTING DATE: June 18, 2013 **HOURS ALLOWED:**

CLIENT CONTACT: Domenico Renzella **PHONE:** 905-335-3665

REPORT DUE DATE:

SPECIAL INSTRUCTIONS:

. Supervise the decommissioning of ground water monitoring wells installed as part of our Phase Two ESA

Appendix B

AGAT Laboratories Limited

Certificates of Analysis

O. Reg. 153/04, As Amended, Table 3 Standards (Soil)

Residential/Parkland/Institutional Property Use

AGAT Laboratories

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: PETO MACCALLUM LIMITED
45 BURFORD ROAD
HAMILTON, ON L8E3C5
(905) 561-2231

ATTENTION TO: Dave Smith

PROJECT NO: 13HX002

AGAT WORK ORDER: 13T728391

SOIL ANALYSIS REVIEWED BY: Anthony Dapaah, PhD (Chem), Inorganic Lab Manager

TRACE ORGANICS REVIEWED BY: Manpreet Sarao, Senior Analyst

DATE REPORTED: Jun 28, 2013

PAGES (INCLUDING COVER): 13

VERSION*: 3

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

NOTES
VERSION 3:Revised report sent on August 13, 2013. Revision: Sample ID change requested by client.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-06-20 **DATE REPORTED: 2013-06-28**

		SAMPLE DESCRIPTION:		TP118 GS1	TP118 GS2	TP120 GS1	TP120 GS2	TP122 GS1	TP122 GS2	TP123 GS3	TP126 GS2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479351	4479353	4479355	4479357	4479360	4479362	4479364	4479367
Barium	µg/g	390	2	91	109	54	89	49	112	69	34
Beryllium	µg/g	4	0.5	0.7	0.8	<0.5	0.7	<0.5	0.8	<0.5	<0.5
Boron	µg/g	120	5	8	7	8	8	9	<5	10	16
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	0.6	1.6
Chromium	µg/g	160	2	20	23	33	21	10	23	17	28
Cobalt	µg/g	22	0.5	10.8	12.6	6.1	11.1	4.1	12.4	5.9	5.4
Copper	µg/g	140	1	27	29	36	33	25	18	30	26
Lead	µg/g	120	1	19	22	110	11	43	17	80	47
Molybdenum	µg/g	6.9	0.5	<0.5	0.7	1.2	<0.5	0.9	<0.5	1.2	1.3
Nickel	µg/g	100	1	24	24	15	27	10	20	14	10
Silver	µg/g	20	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	23	0.5	0.5	0.5	<0.5	<0.5	<0.5	0.9	0.5	<0.5
Vanadium	µg/g	86	1	25	30	20	28	13	30	18	20
Zinc	µg/g	340	5	62	85	162	63	106	68	111	342

Certified By: Tony Ipach

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-06-20 **DATE REPORTED: 2013-06-28**

		SAMPLE DESCRIPTION:		TP128 GS2	TP128 GS3	TP129 GS2	TP129 GS4	TP130 GS1	TP131 GS2	TP131 GS5	DUPLICATE A
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479369	4479371	4479373	4479375	4479377	4479379	4479382	4479383
Barium	µg/g	390	2	68	80	27	159	54	50	113	75
Beryllium	µg/g	4	0.5	<0.5	0.6	<0.5	0.9	<0.5	<0.5	0.7	0.6
Boron	µg/g	120	5	9	8	16	<5	7	11	7	8
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	**1.4**	<0.5	0.7	0.6	<0.5	<0.5
Chromium	µg/g	160	2	14	17	9	25	13	10	21	18
Cobalt	µg/g	22	0.5	6.3	9.9	3.3	7.8	5.8	5.1	11.2	10.7
Copper	µg/g	140	1	26	28	13	31	77	60	32	27
Lead	µg/g	120	1	34	10	43	15	42	120	12	11
Molybdenum	µg/g	6.9	0.5	0.9	<0.5	1.3	<0.5	0.7	1.1	<0.5	<0.5
Nickel	µg/g	100	1	14	24	10	22	13	15	26	25
Silver	µg/g	20	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	23	0.5	<0.5	0.8	<0.5	1.5	0.5	<0.5	<0.5	<0.5
Vanadium	µg/g	86	1	17	23	9	29	18	13	28	24
Zinc	µg/g	340	5	103	52	**360**	75	329	131	71	58

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T3(RPI) - Current

Certified By: Tony Nash

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - ORPs (Soil) - EC

DATE RECEIVED: 2013-06-20

DATE REPORTED: 2013-06-28

		SAMPLE DESCRIPTION:		Stockpile GS1	Stockpile GS2	Stockpile GS3	DUPLICATE E
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479390	4479391	4479392	4479393
Electrical Conductivity	mS/cm	0.7	0.005	0.177	0.275	0.191	0.174

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T3(RPI) - Current

4479390-4479393 EC was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).

Certified By: Tony Marsh

Results relate only to the items tested and to all the items tested

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AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - ORPs (Soil) - HWE B

DATE RECEIVED: 2013-06-20 **DATE REPORTED: 2013-06-28**

		SAMPLE DESCRIPTION:		TP109 GS2	TP109 GS3	TP110 GS1	TP111 GS2	TP112 GS1	TP112 GS2	TP113 GS1	TP113 GS2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479335	4479337	4479341	4479342	4479343	4479344	4479345	4479346
Boron (Hot Water Soluble)	µg/g	1.5	0.10	6.86	0.56	0.56	1.68	0.27	0.40	0.36	0.70

		SAMPLE DESCRIPTION:		TP114 GS2	TP115 GS1	TP116 GS1	DUPLICATE D	TP120 GS1	TP121 GS2	TP122 GS1	TP125 GS2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479347	4479348	4479349	4479350	4479355	4479359	4479360	4479366
Boron (Hot Water Soluble)	µg/g	1.5	0.10	0.73	0.35	0.10	0.46	0.73	1.04	0.58	0.45

		SAMPLE DESCRIPTION:		TP126 GS2	TP119 GS1	TP127 GS1
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479367	4479388	4479389
Boron (Hot Water Soluble)	µg/g	1.5	0.10	0.67	1.06	0.94

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T3(RPI) - Current

Certified By: Tony Marsh

Results relate only to the items tested and to all the items tested

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AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2013-06-20 **DATE REPORTED: 2013-06-28**

		SAMPLE DESCRIPTION:		TP101 GS1	TP102 GS1	TP103 GS1	TP103 GS2	TP104 GS1	TP105 GS1	TP106 GS1	TP107 GS1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	**Unit**	**G / S**	**RDL**	**4479313**	**4479316**	**4479318**	**4479320**	**4479322**	**4479324**	**4479326**	**4479328**
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	300	50	81	<50	500	<50	<50	180	120	140
F4 (C34 to C50)	µg/g	2800	50	160	<50	880	<50	<50	300	210	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	11.6	24.2	19.3	15.5	19.1	21.6	8.0	17.2
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Xylene Mixture	µg/g	3.1	0.05	0.29	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		71	81	71	99	117	102	81	77

Certified By: Manpreet Saleo

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Certificate of Analysis

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2013-06-20

DATE REPORTED: 2013-06-28

		SAMPLE DESCRIPTION:		TP107 GS2	TP108 GS1	DUPLICATE C	TP118 GS1	TP118 GS2	TP120 GS1	TP120 GS2	TP122 GS1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479330	4479332	4479334	4479351	4479353	4479355	4479357	4479360
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	300	50	<50	110	<50	<50	<50	210	<50	180
F4 (C34 to C50)	µg/g	2800	50	<50	<50	<50	<50	<50	130	<50	130
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	17.3	10.6	13.0	16.7	17.3	22.0	18.9	5.8
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Terphenyl	%	60-140		113	100	71	71	65	98	72	90

Certified By: Manpreet Saroo

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Certificate of Analysis

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2013-06-20 **DATE REPORTED: 2013-06-28**

		SAMPLE DESCRIPTION:		TP122 GS2	TP123 GS3	TP126 GS2	TP128 GS2	TP128 GS3	TP129 GS2	TP129 GS4	TP130 GS1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013	6/18/2013
Parameter	Unit	G / S	RDL	4479362	4479364	4479367	4479369	4479371	4479373	4479375	4479377
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	300	50	<50	510	120	150	<50	<50	<50	92
F4 (C34 to C50)	µg/g	2800	50	<50	170	95	70	<50	<50	<50	180
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	18.6	12.6	9.7	7.5	13.8	6.5	26.9	17.0
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		90	63	85	87	63	81	133	110

Certified By: Manpreet Sarao

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2013-06-20

DATE REPORTED: 2013-06-28

		SAMPLE DESCRIPTION:		TP131 GS2	TP131 GS5	DUPLICATE B
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		6/18/2013	6/18/2013	6/18/2013
Parameter	**Unit**	**G / S**	**RDL**	**4479379**	**4479382**	**4479385**
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10
F3 (C16 to C34)	µg/g	300	50	100	<50	<50
F4 (C34 to C50)	µg/g	2800	50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA
Moisture Content	%		0.1	6.1	19.6	20.7
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**		**4479379**	**4479382**	**4479385**
Terphenyl	%	60-140		79	103	138

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T3(RPI) - Current

4479313-4479385 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By: Manpreet Saroo

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AGAT Laboratories

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Guideline Violation

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Dave Smith

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	GUIDEVALUE	RESULT
4479318	TP103 GS1	T3(RPI) - Current	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	300	500
4479335	TP109 GS2	T3(RPI) - Current	O. Reg. 153(511) - ORPs (Soil) - HWE B	Boron (Hot Water Soluble)	1.5	6.86
4479342	TP111 GS2	T3(RPI) - Current	O. Reg. 153(511) - ORPs (Soil) - HWE B	Boron (Hot Water Soluble)	1.5	1.68
4479364	TP123 GS3	T3(RPI) - Current	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	300	510
4479367	TP126 GS2	T3(RPI) - Current	O. Reg. 153(511) - Metals (Abbrev) (Soil)	Cadmium	1.2	1.6
4479367	TP126 GS2	T3(RPI) - Current	O. Reg. 153(511) - Metals (Abbrev) (Soil)	Zinc	340	342
4479373	TP129 GS2	T3(RPI) - Current	O. Reg. 153(511) - Metals (Abbrev) (Soil)	Cadmium	1.2	1.4
4479373	TP129 GS2	T3(RPI) - Current	O. Reg. 153(511) - Metals (Abbrev) (Soil)	Zinc	340	360

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Quality Assurance

CLIENT NAME: PETO MACCALLUM LIMITED

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

ATTENTION TO: Dave Smith

Soil Analysis

RPT Date: Jun 28, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - ORPs (Soil) - HWE B															
Boron (Hot Water Soluble)	1	4479335	6.86	7.20	4.8%	< 0.10	82%	60%	140%	99%	70%	130%	111%	60%	140%
O. Reg. 153(511) - Metals (Abbrev) (Soil)															
Barium	1	4479351	91	93	2.2%	< 2	103%	70%	130%	109%	80%	120%	106%	70%	130%
Beryllium	1	4479351	0.7	0.7	0.0%	< 0.5	107%	70%	130%	100%	80%	120%	97%	70%	130%
Boron	1	4479351	8	9	11.8%	< 5	89%	70%	130%	97%	80%	120%	95%	70%	130%
Cadmium	1	4479351	< 0.5	< 0.5	0.0%	< 0.5	103%	70%	130%	108%	80%	120%	114%	70%	130%
Chromium	1	4479351	20	20	0.0%	< 2	93%	70%	130%	100%	80%	120%	94%	70%	130%
Cobalt	1	4479351	10.8	10.8	0.0%	< 0.5	99%	70%	130%	99%	80%	120%	93%	70%	130%
Copper	1	4479351	27	28	3.6%	< 1	102%	70%	130%	108%	80%	120%	96%	70%	130%
Lead	1	4479351	19	15	23.5%	< 1	104%	70%	130%	104%	80%	120%	103%	70%	130%
Molybdenum	1	4479351	< 0.5	< 0.5	0.0%	< 0.5	108%	70%	130%	99%	80%	120%	105%	70%	130%
Nickel	1	4479351	24	25	4.1%	< 1	103%	70%	130%	89%	80%	120%	92%	70%	130%
Silver	1	4479351	< 0.2	< 0.2	0.0%	< 0.2	104%	70%	130%	116%	80%	120%	120%	70%	130%
Thallium	1	4479351	< 0.4	< 0.4	0.0%	< 0.4	93%	70%	130%	98%	80%	120%	97%	70%	130%
Uranium	1	4479351	0.5	0.5	0.0%	< 0.5	97%	70%	130%	96%	80%	120%	95%	70%	130%
Vanadium	1	4479351	25	27	7.7%	< 1	103%	70%	130%	97%	80%	120%	92%	70%	130%
Zinc	1	4479351	62	64	3.2%	< 5	101%	70%	130%	103%	80%	120%	101%	70%	130%
O. Reg. 153(511) - ORPs (Soil) - EC															
Electrical Conductivity	1		0.208	0.207	0.5%	< 0.005	94%	90%	110%	NA			NA		

Comments: NA signifies Not Applicable.

Certified By: Tony Nash

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Quality Assurance

CLIENT NAME: PETO MACCALLUM LIMITED

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

ATTENTION TO: Dave Smith

Trace Organics Analysis

RPT Date: Jun 28, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Soil)															
Benzene	1	4479362	< 0.02	< 0.02	0.0%	< 0.02	124%	50%	140%	101%	60%	130%	67%	50%	140%
Ethylbenzene	1	4479362	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	100%	60%	130%	66%	50%	140%
F1 (C6 to C10)	1	4479362	< 5	< 5	0.0%	< 5	94%	60%	140%	91%	80%	120%	74%	60%	140%
F2 (C10 to C16)	1	4479367	< 10	< 10	0.0%	< 10	113%	60%	140%	81%	80%	120%	79%	60%	140%
F3 (C16 to C34)	1	4479367	< 50	< 50	0.0%	< 50	118%	60%	140%	82%	80%	120%	84%	60%	140%
F4 (C34 to C50)	1	4479367	< 50	< 50	0.0%	< 50	114%	60%	140%	88%	80%	120%	77%	60%	140%
Toluene	1	4479362	< 0.08	< 0.08	0.0%	< 0.08	83%	50%	140%	98%	60%	130%	65%	50%	140%
Xylene Mixture	1	4479362	< 0.05	< 0.05	0.0%	< 0.05	85%	50%	140%	100%	60%	130%	74%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (Soil)															
Benzene	1	4479330	< 0.02	< 0.02	0.0%	< 0.02	83%	50%	140%	106%	60%	130%	67%	50%	140%
Ethylbenzene	1	4479330	< 0.05	< 0.05	0.0%	< 0.05	87%	50%	140%	106%	60%	130%	66%	50%	140%
F1 (C6 to C10)	1	4479330	< 5	< 5	0.0%	< 5	80%	60%	140%	80%	80%	120%	67%	60%	140%
Toluene	1	4479330	< 0.08	< 0.08	0.0%	< 0.08	86%	50%	140%	106%	60%	130%	65%	50%	140%
Xylene Mixture	1	4479330	< 0.05	< 0.05	0.0%	< 0.05	90%	50%	140%	109%	60%	130%	74%	50%	140%

Certified By: Manpreet Sarao

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Method Summary

CLIENT NAME: PETO MACCALLUM LIMITED

AGAT WORK ORDER: 13T728391

PROJECT NO: 13HX002

ATTENTION TO: Dave Smith

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Trace Organics Analysis			
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 8.7/9.2/8.3
AGAT WO #: 13T728391
Lab Temperature:
Notes:

Client Information

Company: Peto MacCallum Ltd.
Contact: David Smith
Address: 45 Burford Rd
Hamilton L8E 3C6
Phone: 905-561-2231 Fax: 905-561-6366
Project: 13HX002 PO:
AGAT Quotation #:
Please note, if quotation number is not provided, client will be billed full price for analysis.

Regulatory Requirements

- [x] Regulation 153/04 (reg. 511 Amend.) Table 1 (Indicate one)
- [ ] Ind/Com
- [ ] Res/Park
- [ ] Agriculture

Soil Texture (check one): [x] Coarse [ ] Fine

- [ ] Sewer Use — Region (Indicate one)
- [ ] Sanitary
- [ ] Storm

- [ ] Regulation 558
- [ ] CCME
- [ ] Other (specify)
- [ ] Prov. Water Quality Objectives (PWQO)
- [ ] None

Turnaround Time Required (TAT) Required*

Regular TAT
[x] 5 to 7 Working Days

Rush TAT (please provide prior notification)
Rush Surcharges Apply
- [ ] 3 Working Days
- [ ] 2 Working Days
- [ ] 1 Working Day

OR
Date Required (Rush surcharges may apply):

*TAT is exclusive of weekends and statutory holidays

Invoice To

Same: Yes [x] No [ ]
Company:
Contact:
Address:

Is this a drinking water sample? (potable water intended for human consumption) [ ] Yes [x] No
If "Yes", please use the *Drinking Water Chain of Custody Form*

Is this submission for a **Record of Site Condition?** [ ] Yes [x] No

Legend Matrix

GW Ground Water O Oil
SW Surface Water P Paint
SD Sediment S Soil

Report Information – reports to be sent to:

1. Name: David Smith
   Email: dsmith@petomaccallum.com
2. Name: Sarah Murray
   Email: Smurray@petomaccallum.com

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/Sample Information	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐ B-HWS ☐ Cl- ☐ CN- ☐ EC ☐ FOC ☐ Cr+6- ☐ SAR ☐ Hg ☐ pH ☐ NO_3/NO_2 ☐ N-Total	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	VOC: ☐ VOC ☐ THM ☐ BTEX	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use	Boron (HWS)
Area 1 TP101 GS1	June 19/13	1:45	S	2	jar + vial								X							
Area 1 TP102 GS1	"	1:58											X							
Area 1 TP103 GS1	"	2:30											X							
Area 1 TP103 GS2	"	2:35											X							
Area 1 TP104 GS1	"	2:10											X							
Area 1 TP105 GS1	"	2:21											X							
Area 1 TP106 GS1		2:45											X							
Area 1 TP107 GS1	"	3:00											X							
Area 1 TP107 GS2	"	3:05											X							
Area TP108 GS1	"	3:10											X							
DUPLICATE C	"	—											X							
Area 2 TP109 GS2	"	3:43	S	1															X	

Samples Relinquished By (Print Name and Sign): Sarah Murray — Date/Time: June 20/13 8:00
Samples Received By (Print Name and Sign): — Date/Time: June 20/13 2:15
Samples Relinquished By (Print Name and Sign): — Date/Time:
Samples Received By (Print Name and Sign): — Date/Time: 3:10

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 5
N°: 192529

Document ID: DN 78 1511 007
Date Issued: July 23, 2012

AGAT Laboratories

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Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 8.7 / 9.2 / 8.3
AGAT WO #:
Lab Temperature:
Notes:

Client Information:
Company: Peto MacCallum Ltd
Contact: David Smith
Address: 45 Burford Road, Hamilton, L8E 3L6
Phone: 905-561-2231 Fax: 905-561-6360
Project: 13HX002 PO:
AGAT Quotation #:
Please note, if quotation number is not provided, client will be billed full price for analysis.

Regulatory Requirements:
☑ Regulation 153/09 (reg. 511 Amend.)
Table 1 (Indicate one)
☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (check one): ☑ Coarse ☐ Fine
☐ Sewer Use
Region (Indicate one)
☐ Sanitary ☐ Storm
☐ Regulation 558 ☐ CCME ☐ Other (specify)
☐ Prov. Water Quality Objectives (PWQO) ☐ None

Turnaround Time Required (TAT) Required*
Regular TAT
☑ 5 to 7 Working Days
Rush TAT (please provide prior notification)
Rush Surcharges Apply
☐ 3 Working Days ☐ 2 Working Days ☐ 1 Working Day
OR
Date Required (Rush surcharges may apply):
*TAT is exclusive of weekends and statutory holidays

Invoice To: Same: Yes ☑ No ☐
Company:
Contact:
Address:

Is this a drinking water sample? (potable water intended for human consumption) ☐ Yes ☑ No
If "Yes", please use the Drinking Water Chain of Custody Form

Is this submission for a Record of Site Condition? ☐ Yes ☑ No

Legend Matrix
GW Ground Water O Oil
SW Surface Water P Paint
SD Sediment S Soil

Report Information - reports to be sent to:
1. Name: David Smith
Email: dsmith@petomaccallum.com
2. Name: Sarah Murray
Email: smurray@petomaccallum.com

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/Sample Information	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ EC ☐ FOC ☐ Cr+6 ☐ SAR ☐ NO_3/NO_2 ☐ N- Total ☐ Hg ☐ pH	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	VOC: ☐ VOC ☐ THM ☐ BTEX	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	TCLP:	Sewer Use	Barium (HWS)
Area 2 TP9 GS3	June 18/13	3:45	S	1																	X
Area 2 TP10 GS1		3:29																			X
[illegible]		[illegible]																			[illegible]
Area 2 TP11 GS2		3:57																			X
[illegible]		[illegible]																			[illegible]
Area 2 TP12 GS1		5:15																			X
Area 2 TP12 GS2		5:18																			X
Area 2 TP13 GS1		4:18																			X
Area 2 TP13 GS2		4:25																			X
Area 2 TP14 GS2		5:03																			X
[illegible]		[illegible]																			[illegible]
Area 2 TP15 GS1		4:35																			X

Samples Relinquished by (print name & sign): Sarah Murray
Date/Time: June 18/13 8:00
Samples Received by (Print name & sign): [illegible]
Date/Time: June 20/13 2:15
Samples Relinquished by (print name & sign):
Date/Time:
Samples Received by (print name & sign):
Date/Time: 3:10

Pink Copy - Client
Yellow + Golden Copy - AGAT
White Copy - AGAT

Document ID: DM-78-1511.006
Date Issued: July 20, 2011

AGAT Laboratories

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Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 8.7/9.2/8.3
AGAT WO #:
Lab Temperature:
Notes:

Client Information:
Company: Peto MacCallum Ltd
Contact: David Smith
Address: 45 Burford Road
Hamilton L8E 3C6
Phone: 905-561-6366 Fax: 905-561-2231
Project: 13HXD02 PO:
AGAT Quotation #:
Please note, if quotation number is not provided, client will be billed full price for analysis.

Regulatory Requirements:
☑ Regulation 153/09 (reg. 511 Amend.)
Table 1 (indicate one)
☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (check one): ☑ Coarse ☐ Fine
☐ Sewer Use
Region (indicate one)
☐ Sanitary ☐ Storm
☐ Regulation 558 ☐ CCME ☐ Other (specify)
☐ Prov. Water Quality Objectives (PWQO) ☐ None

Turnaround Time Required (TAT) Required*
Regular TAT
☑ 5 to 7 Working Days
Rush TAT (please provide prior notification)
Rush Surcharges Apply
☐ 3 Working Days ☐ 2 Working Days ☐ 1 Working Day
OR
Date Required (Rush surcharges may apply):
*TAT is exclusive of weekends and statutory holidays

Invoice To: Same: Yes ☑ No ☐
Company:
Contact:
Address:

Is this a drinking water sample? (potable water intended for human consumption) ☐ Yes ☑ No
If "Yes", please use the *Drinking Water Chain of Custody Form*

Is this submission for a Record of Site Condition? ☐ Yes ☑ No

Legend Matrix
GW Ground Water O Oil
SW Surface Water P Paint
SD Sediment S Soil

Report Information – reports to be sent to:
1. Name: David Smith
Email: dsmith@petomaccallum.com
2. Name: Sarah Murray
Email: smurray@petomaccallum.com

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/Sample Information	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ EC ☐ FOC ☐ Cr+6 ☐ SAR ☐ NO_3/NO_2 ☐ N-Total ☐ Hg ☐ pH	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	VOC: ☐ VOC ☐ THM ☐ BTEX	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	TCLP:	Sewer Use	Boron (HWS)	Reg. 153 Metals
Area 2 TP11 GS1	June 25/13	4:46	S	1																	X	X
DUPLICATE D	"	—	S	1																	X	X
Area 3 TP18 GS1	"	12:46	S	2									X									X
Area 3 TP18 GS2	"	12:50	S	2									X									X
Area 3 TP19 GS1	"	12:33	S	2									X								X	X
Area 3 TP20 GS2	"	12:35	S	2									X									X
Area 3 TP21 GS2	"	1:08	S	1																	X	
Area 3 TP22 GS1	"	1:25	S	2									X								X	X
Area 3 TP22 GS2	"	1:30	S	2									X									X
Area 3 TP23 GS3	"	11:20	S	2									X									X
Area 3 TP25 GS2	"	10:45	S	1									[redacted]								X	
Area 3 TP26 GS2	"	10:17	S	2									X								X	X

Samples Relinquished by (print name & sign): Sarah Murray S. Murray — Date/Time: June 26/13 T:00
Samples Received by (Print name & sign): — Date/Time: 26/13
Samples Relinquished by (print name & sign): — Date/Time:
Samples Received by (Print name & sign): — Date/Time: 5:10

Pink Copy - Client
Yellow + Golden Copy - AGAT
White Copy - AGAT

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NO: 179951

Document ID: DV-78-1511.006
Date Issued: July 20, 2011

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario
L4Z 1Y2
www.agatlabs.com · webearth.agatlabs.com

Ph.: 905.712.5100 · Fax: 905.712.5122 · Toll Free: 800.856.6261

Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 8.7 / 9.2 / 8.3
AGAT WO #:
Lab Temperature:
Notes:

Client Information:
Company: Dr. to MacCallum Ltd
Contact: David Smith
Address: 45 Burford Rd
Hamilton L8E 3L6
Phone: 905-561-2231 Fax: 905-561-6326
Project: 13-1X002 PO:
AGAT Quotation #:
Please note, if quotation number is not provided, client will be billed full price for analysis.

Regulatory Requirements:
☑ Regulation 153/09 (reg. 511 Amend.)
Table 1 (indicate one)
☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (check one): ☑ Coarse ☐ Fine
☐ Sewer Use
Region (indicate one)
☐ Sanitary ☐ Storm
☐ Regulation 558 ☐ CCME ☐ Other (specify)
☐ Prov. Water Quality Objectives (PWQO) ☐ None

Turnaround Time Required (TAT) Required*
Regular TAT
☑ 5 to 7 Working Days
Rush TAT (please provide prior notification)
Rush Surcharges Apply
☐ 3 Working Days ☐ 2 Working Days ☐ 1 Working Day
OR
Date Required (Rush surcharges may apply):
*TAT is exclusive of weekends and statutory holidays

Invoice To: Same: Yes ☑ No ☐
Company:
Contact:
Address:

Is this a drinking water sample? (potable water intended for human consumption) ☐ Yes ☑ No
If "Yes", please use the *Drinking Water Chain of Custody Form*

Is this submission for a Record of Site Condition? ☐ Yes ☑ No

Legend Matrix
GW Ground Water O Oil
SW Surface Water P Paint
SD Sediment S Soil

Report Information – reports to be sent to:
1. Name: David Smith
Email: dsmith@pctomacCallum.com
2. Name: Sarah Murray
Email: Smurray@pctomacCallum.com

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/Sample Information	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ EC ☐ FOC ☐ Cr+6 ☐ SAR ☐ NO_2/NO_3 ☐ N-Total ☐ Hg ☐ pH	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	VOC: ☐ VOC ☐ THM ☐ BTEX	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	TCLP:	Sewer Use	Boron (HWS)	Reg. 153 Metals	Electrical Conductivity
Area 3 TP128 GS2	June 13/13	11:09	S	2									X									X	X
Area 3 TP128 GS3	"	11:10		1									X									X	X
Area 3 TP129 GS2	"	9:26											X									X	X
Area 3 TP129 GS4	"	9:30											X									X	X
Area 3 TP130 GS1	"	9:00											X									X	X
Area 3 TP131 GS2	"	8:40											X									X	X
Area 3 TP131 GS5	"	8:45											X									X	X
DUPLICATE A	"	—																				X	X
DUPLICATE B	"	—											X										
Area 3 TP119 GS1	"	12:57	S	1																	X		
Area 3 TP127 GS1	"	9:48	S																		X		
Stockpile GS1	"	5:35	S																				X

Samples Relinquished by (print name & sign): Sarah Murray — Date/Time: June 13 8:55
Samples Relinquished by (print name & sign): — Date/Time:
Samples Received by (Print name & sign): — Date/Time: 2:15
Samples Received by (Print name & sign): — Date/Time: 3:10

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White Copy – AGAT

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NO: 179950

AGAT Laboratories

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Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 8.7/9.2/8.3
AGAT WO #:
Lab Temperature:
Notes:

Client Information:

Company: Peto MacCallum Ltd
Contact: David Smith
Address: 45 Burford Road
Hamilton L8E 3C6
Phone: 905-561-2231 Fax: 905-561-6326
Project: 13-K002 PO:
AGAT Quotation #:

Please note, if quotation number is not provided, client will be billed full price for analysis.

Regulatory Requirements:

- [x] Regulation 153/09 (reg. 511 Amend.) — Table 1 (Indicate one)
  - [ ] Ind/Com
  - [ ] Res/Park
  - [ ] Agriculture
  - Soil Texture (check one): [x] Coarse [ ] Fine
- [ ] Sewer Use — Region (Indicate one)
  - [ ] Sanitary
  - [ ] Storm
- [ ] Regulation 558
- [ ] CCME
- [ ] Other (specify)
- [ ] Prov. Water Quality Objectives (PWQO)
- [ ] None

Turnaround Time Required (TAT) Required*

Regular TAT
[x] 5 to 7 Working Days

Rush TAT (please provide prior notification)
Rush Surcharges Apply
- [ ] 3 Working Days
- [ ] 2 Working Days
- [ ] 1 Working Day

OR

Date Required (Rush surcharges may apply):

*TAT is exclusive of weekends and statutory holidays

Invoice To:

Same: Yes [x] No [ ]
Company:
Contact:
Address:

Is this a drinking water sample? (potable water intended for human consumption) [ ] Yes [x] No
If "Yes", please use the *Drinking Water Chain of Custody Form*

Is this submission for a Record of Site Condition? [ ] Yes [x] No

Legend Matrix

GW Ground Water O Oil
SW Surface Water P Paint
SD Sediment S Soil

Report Information – reports to be sent to:

1. Name: David Smith
   Email: dsmith@petomaccallum.com
2. Name: Sarah Murray
   Email: smurray@petomaccallum.com

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/Sample Information	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ EC ☐ FOC ☐ SAR ☐ NO_2/NO_3 ☐ N-Total ☐ Cr+6 ☐ Hg ☐ pH	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	VOC: ☐ VOC ☐ THM ☐ BTEX	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	TCLP:	Sewer Use	Electrical Conductivity
Stockpile GS2	June 17/13	5:40	S	1																	X	X
Stockpile GS3	"	5:45	S	1																		
DUPLICATE E	"	—	S	1																		

Samples Relinquished by (print name & sign): Sarah Murray
Date/Time: June 20/13 8:00
Samples Received by (Print name & sign):
Date/Time: June 20/13
Samples Relinquished by (print name & sign):
Date/Time:
Samples Received by (Print name & sign):
Date/Time: 3:10

Pink Copy - Client
Yellow + Golden Copy - AGAT
White Copy - AGAT

NO: 179949

Appendix C

Statement of Limitations

STATEMENT OF LIMITATIONS

This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity: that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may effect the validity of the findings and recommendations given in this report.

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the Site is free from any contaminants from past or current land use activities or that the conditions in all areas of the Site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, ground water, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

STATEMENT OF LIMITATIONS

Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence an action or bring any other proceedings, whether in contract, tort, or otherwise against PML in any way connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate.

Environmental site assessment studies are performed in different phases by the application of different levels of effort and expense. The phase or phases in this report and the level of effort proposed for this assignment were based solely on PML's understanding of the client's needs as described in the scope of services contained in this report.

This assessment does not wholly eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with the subject property and must be viewed as a mechanism to reduce risk rather than eliminate the risk of contamination concerns.

The parties agree that PML cannot and does not warrant or represent that bids or negotiated prices will not vary from the Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate. The parties further agree that nothing in their agreement shall be deemed to be a cost condition or representation that the project cleanup can be completed for the amount of the Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate or any other amount.