Geotechnical Engineering

Environmental Engineering

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Geotechnical Investigation

Proposed Residential Development 3604-3646 Innes Road Ottawa, Ontario

Prepared For

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Drawing PG4026-2 - Permissible Grade Raise Plan



1.0 Introduction

Paterson Group (Paterson) was commissioned by Glenview Homes (Innes) Ltd. to conduct a geotechnical investigation for the proposed residential development to be located at 3604, 3636 and 3646 Innes Road, in the City of Ottawa, Ontario (Refer to Figure 1 - Key Plan in Appendix 2).

The objectives of the current geotechnical review were:

to determine the subsurface soil and groundwater conditions based on the soils
information.

to provide geotechnical recommendations pertaining to design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. The report contains the geotechnical findings and recommendations pertaining to the design and construction of the subject development as understood at the time of writing this report.

2.0 Proposed Development

Specific details of the proposed development were not available at the time of writing this report. However it is understood that the proposed development will consist of townhouse units and residential single unit dwellings. It is also anticipated that the development will include associated car parking areas, residential driveways, access lanes and landscaped areas. It is further understood that the site will be municipally serviced.



3.0 Method of Investigation

3.1 Field Investigation

The field program for the current investigation was conducted between December 5 and December 7, 2018. At that time, a total of 10 (ten) boreholes (BH) were advanced to a maximum depth of 6.7 m. Previous field investigations were completed by Paterson between September 2014 and August 2017. During that time, a total of 6 test holes, consisting of boreholes and test pits were extended to a maximum depth of 7.1 m.

Previous geotechnical investigations were also completed by others within the area of the subject site. The results of the previous investigations by others are discussed in the current report. The locations of the test holes are shown on Drawing PG4026-1 - Test Hole Location Plan included in Appendix 2.

The boreholes were completed using a track mounted auger drill rig operated by a two person crew. The test pits were completed using a hydraulic shovel. All fieldwork was conducted under the full-time supervision of Paterson personnel from our geotechnical division under the direction of a senior engineer. The testing procedure consisted of augering to the required depths and at the selected locations sampling the overburden.

Two (2) investigations were completed by others for environmental purposes for the subject site. The field work was conducted in 2013 and 2016. A total of 34 test holes were completed during the course of the investigations by others. The test holes were advanced to a maximum depth of 7.0 m below existing ground surface.

Sampling and In Situ Testing

Soil samples were collected from the boreholes using a 50 mm diameter split spoon sampler. Soil samples were also recovered along the sidewalls of the test pits by hand during excavation.

All soil samples were visually inspected and initially classified on site. The split spoon samples were placed in sealed plastic bags. All samples were transported to our laboratory for examination and classification. The depths at which the split spoon, auger and grab samples were recovered from the test holes are shown as SS, AU and G, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1.



The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as "N" values on the Soil Profile and Test Data sheets. The "N" value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

Undrained shear strength testing was carried out at regular depth intervals in cohesive soils using a field vane apparatus.

Overburden thickness was evaluated during the course of the site investigations by dynamic cone penetration testing (DCPT) at several borehole locations. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment.

The subsurface conditions observed at the borehole and test pit locations were recorded in detail in the field. The soil profiles are presented on the Soil Profile and Test Data sheets and Borehole Logs by Others in Appendix 1.

Groundwater

Flexible standpipes were installed in all boreholes to monitor the groundwater levels subsequent to the completion of the sampling program. Groundwater infiltration levels were noted at the time of excavation at the test pit locations.

3.2 Field Survey

The borehole locations were determined by Paterson personnel taking into consideration the presence of underground and aboveground services. The location and ground surface elevation at each borehole location were provided by J.D. Barnes Limited. It is understood that the elevations are referenced to a geodetic datum. The test hole locations and ground surface elevations at the test hole locations are presented on Drawing PG4026-1 - Test Hole Location Plan in Appendix 2.

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3.3 Laboratory Testing

The soil samples recovered from the subject site were visually examined in our laboratory to review the results of the field logging. A total of two (2) Atterberg limit tests were completed on selected silty clay samples. Grain size distribution (hydrometer) testing was also completed on two (2) soil samples and one (1) soil sample was submitted for shrinkage testing. The results are presented in Subsection 4.2 of our current report and in Appendix 1.

3.4 Analytical Testing

One (1) soil sample was submitted to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The sample was analyzed to determine the concentration of sulphate and chloride, the resistivity and the pH of the sample. The results are discussed in Subsection 6.7 and shown in Appendix 1.

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4.0 Observations

4.1 Surface Conditions

The north portion of the subject site is currently occupied by commercial buildings with associated paved/gravel surfaced areas used for parking and storage units. The gravel surfacing extends approximately 400 m south of Innes Road, and is relatively flat and at grade with Innes Road. The ground surface along the north portion of the site is relatively flat and at grade with Innes Road. The ground surface south of the gravel surfaced area consists of grass covered, undeveloped land with occasional trees, and slopes gradually down toward the south. The site is bordered to the north by Innes Road and to the east, south and west by undeveloped land. Additional commercial properties border the subject site to the east and west along Innes Road.

4.2 Subsurface Profile

Overburden

Generally, the subsurface profile at the borehole locations consisted of a layer of topsoil, followed by a very stiff to stiff brown silty clay crust. A stiff to firm grey silty clay deposit was encountered below the aforementioned layers. A glacial till deposit was encountered below the grey silty clay at some borehole locations. The fine matrix of the glacial till was observed to consist of grey silty clay with sand and gravel, with occasional cobbles and boulders. Practical refusal to augering was encountered at BH 2-18, BH 3-18 and BH 5-18 at depths of 3.8 to 5.6 m. Practical refusal to DCPT was encountered at a depth of 10.4 m at BH 7. Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for specific details of the soil profiles encountered at each test hole location.

Atterberg Limits Results

The results of the Atterberg Limit tests conducted within the silty clay are presented below in Table 1 - Summary of Atterberg Limits Results and are presented in Appendix 1.

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Table 1 - Summa	Table 1 - Summary of Atterberg Limits Results									
Sample	Liquid Limit %	Plastic Limit %	Plasticity Index %	Classification						
BH1-18 SS2	67	29	38	СН						
BH10-18 SS3	72	29	43	СН						
TP 1 G2	66	21	45	СН						
TP 1 G3	71	24	47	СН						
TP 2 G2	78	25	53	СН						
TP 3 G2	69	25	44	СН						
TP 4 G2	77	25	52	СН						
TP 5 G3	70	24	46	СН						

The results of the shrinkage testing of BH5 SS3 resulted in a shrinkage limit of 19% with a shrinkage ratio of 1.71.

Hydrometer Testing

Two (2) soil samples were submitted for hydrometer testing. The results are summarized in Table 2 and presented on the Grain Size Distribution sheets in Appendix 1.

Table 2 - Summary of Hydrometer Tests								
Fines Content								
Sample	Gravel %	Sand %	Silt %	Clay %				
BH4-18 SS3	0	0.6	29.9	69.5				
BH6-18 SS3	0	0.5	23	76.5				

Bedrock

Based on available geological mapping, the local bedrock consists of limestone and shale of the Bobcaygeon and Lindsay formations with an anticipated overburden thickness of 0 to 25 m.

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4.3 Groundwater

The groundwater levels were measured in the borehole locations on December 14, 2018, and are presented in the Soil Profile and Test Data sheets in Appendix 1.

Table 3 - Summary of Groundwater Level Readings									
Test Hole Number	Ground	Groundwate	er Levels (m)	Recording Date					
	Elevation (m)	Depth	Elevation						
BH1-18	89.02	1.84	87.18	December 14, 2018					
BH2-18	88.81	1.19	87.62	December 14, 2018					
BH3-18	88.43	0.95	87.48	December 14, 2018					
BH4-18	88.26	1.07	87.19	December 14, 2018					
BH5-18	87.47	1.29	86.18	December 14, 2018					
BH6-18	87.61	Damaged	n/a	December 14, 2018					
BH7-18	86.93	1.02	85.91	December 14, 2018					
BH8-18	87.51	Damaged	n/a	December 14, 2018					
BH9-18	86.95	0.65	86.3	December 14, 2018					
BH10-18	86.69	Frozen	n/a	December 14, 2018					

Note: The ground surface elevations at the borehole locations were provided by JD Barnes Limited.

It is important to note that groundwater level readings could be influenced by surface water infiltrating the backfilled borehole, which can lead to higher than typical groundwater levels. The long-term groundwater level can also be estimated based on moisture levels and colouring of the recovered soil samples. Based on these observations at the borehole locations, the long-term groundwater level is expected at a 3 to 4 m depth.

It should be noted that groundwater levels are subject to seasonal fluctuations, therefore groundwater levels could differ at the time of construction.



5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered adequate for the proposed development. It is expected that buildings can be founded by conventional style shallow foundations placed on undisturbed, stiff to firm silty clay, glacial till or a clean, surface sounded bedrock bearing surface.

Due to the presence of the silty clay deposit, the subject site will be subject to permissible grade raise recommendations.

The above and other consideration are discussed in the following paragraphs.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and deleterious fill, such as those containing organic materials, should be stripped from under any buildings, paved areas, pipe bedding, and other settlement sensitive structures.

Due to the presence of shallow bedrock, some bedrock removal may be required to construct footings and municipal services.

Bedrock Removal

Based on the bedrock encountered in the area, line drilling in conjunction with hoeramming or controlled blasting may be required to remove the bedrock. In areas of weathered bedrock and where only a small quantity of bedrock is to be removed, bedrock removal may be possible by hoe-ramming alone.

Prior to considering blasting operations, the blasting effects on the existing services, buildings and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in proximity to the blasting operations should be completed prior to commencing site activities. The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries/claims related to the blasting operations.

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As a general guideline, peak particle velocities (measured at the structures) should not exceed 25 mm/s during the blasting program to reduce the risks of damage to the existing structures.

The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

Excavation side slopes in sound bedrock can be excavated almost vertical side walls. A minimum 1 m horizontal ledge, should remain between the overburden excavation and the bedrock surface. The ledge will provide an area to allow for potential sloughing or a stable base for the overburden shoring system.

Vibration Considerations

Construction operations are the cause of vibrations, and possibly sources of nuisance to the community. Therefore, means to reduce the vibration levels as much as possible should be incorporated in the construction operations to maintain, as much as possible, a cooperative environment with the residents.

The following construction equipments could be the source of vibrations: hoe ram, compactor, dozer, crane, truck traffic, etc. Vibrations, whether caused by blasting operations or by construction operations, could be the source of detrimental vibrations on the nearby buildings and structures. Therefore, all vibrations are recommended to be limited.

Two parameters are used to determine the permissible vibrations, namely, the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz). The guidelines are for current construction standards. Considering that these guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, a pre-construction survey is recommended be completed to minimize the risks of claims during or following the construction of the proposed building.

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Fill Placement

Fill used for grading beneath the building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II material. This material should be tested and approved prior to delivery to the site. The fill should be placed in lifts no greater than 300 mm thick and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the buildings should be compacted to at least 98% of its standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil can be used as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If excavated stiff brown silty clay, free of organics and deleterious materials, is to be used to build up the subgrade level for areas to be paved, the silty clay, under dry conditions, should be compacted in thin lifts to a minimum density of 95% of their respective SPMDD. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

Decommissioning of Standpipe Piezometers

Upon the completion of groundwater level monitoring program, the flexible standpipe piezometers shall be properly decommissioned by licensed and experienced contractor as per Ontario Regulation 903 to protect the water quality of existing and future standpipes and the shared groundwater resources.

As per Ontario Regulation 903, abandonment barrier (sealant) material must be placed continuously from the bottom of the standpipe piezometer upward to approximately 2 m below the ground surface. The abandonment barrier material must be compatible with the quality of the water found in the standpipe piezometer, stable in the presence of any contaminants, and should not contain any materials that may impair the integrity of the abandonment barrier, including soil or drill cuttings. The abandonment barrier should be placed in a manner that does not prevent the placement of clean, washed sand or gravel adjacent to water producing zones or bedrock fractures to minimize the loss of abandonment barrier material. However, the abandonment barrier must be placed in a manner that prevents any movement of water, natural gas, contaminants or other material between subsurface formations (which include aquifers) or between a subsurface formation and the top of abandonment barrier material. After or during the placement of the abandonment barrier, the casing or screen must be removed, if reasonably possible.



During the removal of the screen, the bottom of the screen must be immersed in the rising accumulation of the abandonment barrier until the required level is reached.

To prevent inadvertent or unauthorized access, the standpipe piezometer and the standpipe piezometer opening must be sealed up to the ground surface by placing 50 mm or 150 mm bentonite chips, pellets, granules or powder in accordance with the manufacturer's specifications, and cover the bentonite with soil cover or other material that is keeping with the immediately adjacent material.

5.3 Foundation Design

Bearing Resistance Values

Strip footings, up to 2 m wide, and pad footings, up to 4 m wide, founded on an undisturbed, stiff silty clay can be designed using a bearing resistance value at serviceability limit states (SLS) of **150 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **225 kPa**.

Footings placed on a glacial till or engineered fill bearing surface can be designed using a bearing resistance value at SLS of **150 kPa** and at ULS of **225 kPa**.

A geotechnical resistance factor of 0.5 was incorporated into the abovenoted bearing resistance values at ULS.

An undisturbed soil bearing surface consists of one from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, have been removed, in the dry, prior to the placement of concrete for footings.

Footings bearing on an undisturbed soil bearing surface and designed using the bearing resistance values provided herein will be subjected to potential post construction total and differential settlements of 25 and 20 mm, respectively.

Footings placed on a clean, surface sounded bedrock surface can be designed using a factored bearing resistance value at ULS of **1,000 kPa**, incorporating a geotechnical resistance factor of 0.5.

A clean, surface-sounded bedrock bearing surface should be free of loose materials, and have no near surface seams, voids, fissures or open joints which can be detected from surface sounding with a rock hammer.



Footings bearing on surface sounded bedrock and designed using the above mentioned bearing resistance values will be subjected to negligible post-construction total and differential settlements.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to an undisturbed soil bearing surface above the groundwater table when a plane extending horizontally and vertically from the bottom edge of the footing at a minimum of 1.5H:1V passes through in situ soil of the same or higher capacity as the bearing medium soil.

Adequate lateral support is provided to a sound bedrock bearing medium when a plane extending horizontally and vertically from the bottom edge of the footing at a minimum of 1H:6V passes through in situ soil of the same or higher capacity as the bearing medium soil. A lateral support zone of 1.5H:1V is recommended for a weathered bedrock bearing medium.

Permissible Grade Raise Recommendations

Permissible grade raise restriction areas are also required due to the silty clay deposit. Refer to Drawing PG4026-2 - Permissible Grade Raise Plan in Appendix 2 for further details.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class C** for foundations to be constructed within the north portion of the subject site and a **Class D** for foundations within the south portion of the subject site. The soils underlying the proposed shallow foundations are not susceptible to liquefaction. Reference should be made to the latest revision of the 2012 Ontario Building Code for a full discussion of the earthquake design requirements.

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5.5 Basement Slab

With the removal of all topsoil and fill, containing deleterious or organic materials, the native soil or existing granular fill approved by the geotechnical consultant at the time of excavation will be considered to be an acceptable subgrade surface on which to commence backfilling for basement floor slab or slab on grade construction. Any soft areas should be removed and backfilled with appropriate backfill material. OPSS Granular A or Granular B Type II, with a maximum particle size of 50 mm, are recommended for backfilling below the floor slab.

It is recommended that the upper 200 mm of sub-floor fill for basement slabs consist of 19 mm clear crushed stone. The upper 300 mm of sub-floor fill below slabs on grade should consist of OPSS Granular A crushed stone. All backfill materials within the footprint of the proposed buildings should be placed in maximum 300 mm thick loose layers and compacted to at least 98% of its SPMDD.

5.6 Pavement Structure

For design purposes, the pavement structure presented in the following tables could be used for the design of car only parking areas, local roadways and roadways on which bus traffic is anticipated.

Table 6 - Recommended Pavement Structure - Car Only Parking Areas/Driveways								
Thickness Material Description								
50	Wear Course - Superpave 12.5 Asphaltic Concrete							
150 BASE - OPSS Granular A Crushed Stone								
300 SUBBASE - OPSS Granular B Type II								
SUBGRADE - Either in situ soils or OPSS Granular B Type I or II material placed over in situ soil								

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Table 7 - Recommended Pavement Structure - Local Roadways							
Thickness Material Description							
40 Wear Course - Superpave 12.5 Asphaltic Concrete							
50	Binder Course - Superpave 19.0 Asphaltic Concrete						
150 BASE - OPSS Granular A Crushed Stone							
400 SUBBASE - OPSS Granular B Type II							
SUBGRADE - Either in situ soils or OPSS Granular B Type I or II material placed over in situ soil							

Table 8 - Recommended Pavement Structure - Collector Roads with Bus Traffic								
Thickness (mm) Material Description								
40	Wear Course - Superpave 12.5 Asphaltic Concrete							
50	Upper Binder Course - Superpave 19.0 Asphaltic Concrete							
50 Lower Binder Course - Superpave 19.0 Asphaltic Concrete								
150 BASE - OPSS Granular A Crushed Stone								
550 SUBBASE - OPSS Granular B Type II								
SUBGRADE - Either in situ soils or OPSS Granular B Type I or II material placed over in situ soil								

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type I or II material.

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable vibratory equipment.

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Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on keeping the contact zone between the subgrade material and the base stone in a dry condition. Failure to provide adequate drainage under conditions of heavy wheel loading can result in the fine subgrade soil being pumped into the voids in the stone subbase, thereby reducing its load carrying capacity.

Due to the low permeability of the subgrade materials consideration should be given to installing subdrains during the pavement construction as per City of Ottawa standards. The subdrain inverts should be approximately 300 mm below subgrade level. The subgrade surface should be crowned to promote water flow to the drainage lines.

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6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

It is recommended that a perimeter foundation drainage system be provided for the proposed structures. The system should consist of a 150 mm diameter perforated corrugated plastic pipe, surrounded on all sides by 150 mm of 10 mm clear crushed stone and placed at the footing level around the exterior perimeter of the structure. The pipe should have a positive outlet, such as a gravity connection to the storm sewer.

Backfill against the exterior sides of the foundation walls should consist of free-draining non frost susceptible granular materials. The greater part of the site excavated materials will be frost susceptible and, as such, are not recommended for re-use as backfill against the foundation walls, unless used in conjunction with a composite drainage system, such as Delta Drain 6000 or equivalent. Imported granular materials, such as clean sand or OPSS Granular B Type I granular material should otherwise be used for this purpose.

6.2 Protection Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effect of frost action. A minimum of 1.5 m thick soil cover (or equivalent) should be provided in this regard.

Exterior footings, such as those for isolated exterior piers, are more prone to deleterious movement associated with frost action than the exterior walls of heated structures and require additional protection, such as soil cover of 2.1 m or an equivalent combination of soil cover and foundation insulation.

6.3 Excavation Side Slopes

The side slopes of excavations in the soil and fill overburden materials should be either cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. It is assumed that sufficient room will be available for the greater part of the excavation to be undertaken by open-cut methods (i.e. unsupported excavations).

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The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by "cut and cover" methods and excavations will not be left open for extended periods of time.

6.4 Pipe Bedding and Backfill

The pipe bedding for sewer and water pipes should consist of at least 150 mm of OPSS Granular A material. Where the bedding is located within the grey silty clay or bedrock, the thickness of the bedding material should be increased to a minimum of 300 mm. The material should be placed in maximum 225 mm thick lifts and compacted to a minimum of 95% of its SPMDD. The bedding material should extent at least to the spring line of the pipe.

The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to at least 300 mm above the obvert of the pipe. The material should be placed in maximum 225 mm thick lifts and compacted to a minimum of 95% of its SPMDD.

It should generally be possible to re-use the moist (not wet) brown silty clay above the cover material if the excavation and filling operations are carried out in dry weather conditions. Wet silty clay materials will be difficult to re-use, as the high water contents make compacting impractical without an extensive drying period.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

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To reduce long-term lowering of the groundwater level at this site, clay seals should be provided in the service trenches. The seals should be at least 1.5 m long and should extend from trench wall to trench wall. Generally, the seals should extend from the frost line and fully penetrate the bedding, subbedding and cover material. The barriers should consist of relatively dry and compactable brown silty clay placed in maximum 225 mm thick loose layers and compacted to a minimum of 95% of the material's SPMDD. The clay seals should be placed at the site boundaries and at strategic locations at no more than 60 m intervals in the service trenches.

6.5 Groundwater Control

The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium. It is anticipated that groundwater infiltration into the excavations should be low and controllable using conventional open sumps.

A temporary Ministry of the Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum 4 to 5 months should be allowed for completion of the PTTW application package and issuance of the permit by the MECP.

For typical ground or surface water volumes, being pumped during the construction phase, between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MECP review of the PTTW application.

6.6 Winter Construction

The subsurface conditions at this site mostly consist of frost susceptible materials. In presence of water and freezing conditions ice could form within the soil mass. Heaving and settlement upon thawing could occur. Precautions should be taken if winter construction is considered for this project.



In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters, tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

The trench excavations should be constructed in a manner that will avoid the introduction of frozen materials into the trenches. As well, pavement construction is difficult during winter. The subgrade consists of frost susceptible soils which will experience total and differential frost heaving as the work takes place. In addition, the introduction of frost, snow or ice into the pavement materials, which is difficult to avoid, could adversely affect the performance of the pavement structure. Additional information could be provided, if required.

6.7 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The results of the chloride content, pH and resistively indicate the presence of a moderate to aggressive environment for exposed ferrous metals at this site.

6.8 Landscaping Considerations

Tree Planting Restrictions

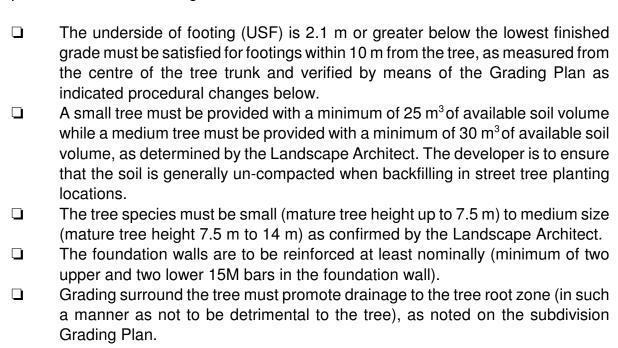
Paterson completed a soils review of the site to determine applicable tree planting setbacks, in accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines) for trees planted within a public right-of-way (ROW). Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site. Sieve analysis testing was also completed on selected soil samples. The results of our testing are presented in Tables 1 and 2 in Subsection 4.2 and in Appendix 1.

Based on the results of our review, a high sensitivity clay soil was encountered between anticipated underside of footing elevations and 3.5 m below anticipated finished grade as per City Guidelines. Based on our Atterberg Limits test results, the modified plasticity limit generally exceeds 40%. The following tree planting setbacks are recommended for these high sensitivity areas.

Report: PG4026-2 Revision 2



Large trees (mature height over 14 m) can be planted within this area provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space). Tree planting setback limits is 7.5 m for small (mature tree height up to 7.5 m) and medium size trees (mature tree height 7.5 m to 14 m) provided that the following conditions are met:



Aboveground Swimming Pools, Hot Tubs, Decks and Additions

The in-situ soils are considered to be acceptable for in-ground swimming pools. Above ground swimming pools must be placed at least 5 m away from the residence foundation and neighbouring foundations. Otherwise, pool construction is considered routine, and can be constructed in accordance with the manufacturer's requirements.

Additional grading around the hot tub should not exceed permissible grade raises. Otherwise, hot tub construction is considered routine, and can be constructed in accordance with the manufacturer's specifications.

Additional grading around proposed deck or addition should not exceed permissible grade raises. Otherwise, standard construction practices are considered acceptable.



7.0 Recommendations

It is a requirement for the foundation design data provided herein to be applicable that a materials testing and observation services program including the following aspects be performed by the geotechnical consultant.

Review of the final grading plan from a geotechnical perspective, once available.
Observation of all bearing surfaces prior to the placement of concrete.
Sampling and testing of the concrete and fill materials used.
Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
Observation of all subgrades prior to backfilling.
Field density tests to determine the level of compaction achieved.
Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued, upon request, following the completion of a satisfactory materials testing and observation program by the geotechnical consultant.



8.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. We request permission to review our recommendations when the drawings and specifications are completed.

A geotechnical investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test hole locations, we request immediate notification to permit reassessment of our recommendations.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on our undertaking the work. The latter should evaluate the factual information provided in this report and determine the suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Glenview Homes (Innes) Ltd. or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

Faisal I. Abou-Seido, P.Eng.



David J. Gilbert, P.Eng

Report Distribution:

- ☐ Glenview Properties Inc. (3 copies)
- ☐ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

BOREHOLES BY OTHERS

SYMBOLS AND TERMS

ATTERBERG LIMITS RESULTS

HYDROMETER TESTING RESULTS

ANALYTICAL TESTING RESULTS

Ground surface elevations provided by J.D. Barnes LimiteD

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

3604-3646 Innes Road Ottawa, Ontario

REMARKS

DATUM

HOLE NO.

PG4026

FILE NO.

BORINGS BY CME 55 Power Auger				D	ATE	Decembe	er 5. 2018		OLE NO. BH 1-18	
SOIL DESCRIPTION	PLOT	SAMPLE DEPTH ELEV.				Pen. Resist. Blows/0.3n • 50 mm Dia. Cone				
	STRATA P	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	O Wate	er Content %	Piezometer Construction
GROUND SURFACE		×		<u> </u>		0-	-89.02	20 40	0 60 80	O D
FILL: Brown silty clay with sand and 30 gravel, trace crushed stone		& AU	1							
		ss	2	50	8	1-	-88.02			
Very stiff to stiff, brown SILTY CLAY		ss	3	92	10	2-	-87.02	()	•
		ss	4	92	Р	3-	-86.02		0	
- firm to stiff and grey by 3.4m depth		ss	5	92	2		05.00		0	
4.72		J				4-	85.02			
GLACIAL TILL: Grey silty clay with		SS S	6	67	Р	5-	84.02			
sand and gravel, occasional cobbles and boulders		SS S	7	33	20	6-	-83.02			
End of Borehole 6.70		ss	8	46	8					
(GWL @ 1.84m - Dec. 14, 2018)										
								20 40 Shear S • Undisturbe	Strength (kPa)	10

SOIL PROFILE AND TEST DATA

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes LimiteD FILE NO. **PG4026 REMARKS** HOLE NO. **BH 2-18** BORINGS BY CME 55 Power Auger DATE December 5, 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction SOIL DESCRIPTION 50 mm Dia. Cone (m) (m) RECOVERY N VALUE or RQD NUMBER Water Content % **GROUND SURFACE** 80 20 40 0 + 88.81**TOPSOIL** 0.20 ΑU 1 SS SS 3 92 75 7 1 + 87.819 Very stiff, brown SILTY CLAY 0 2+86.81 105 SS Ρ 4 100 ٠À 0 - grey by 2.7m depth 3 + 85.81GLACIAL TILL: Grey silty clay with sand and gravel, occasional cobbles SS 5 50 10 and boulders 3.83 SS 6 27 50+ End of Borehole Practical refusal to augering at 3.83m depth (GWL @ 1.19m - Dec. 14, 2018) 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

▲ Undisturbed

△ Remoulded

3604-3646 Innes Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Supplemental Geotechnical Investigation Ottawa, Ontario

Ground surface elevations provided by J.D. Barnes LimiteD **DATUM** FILE NO. **PG4026 REMARKS** HOLE NO. **BH 3-18** BORINGS BY CME 55 Power Auger DATE December 5, 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction SOIL DESCRIPTION 50 mm Dia. Cone (m) (m) N VALUE or RQD RECOVERY NUMBER Water Content % **GROUND SURFACE** 80 20 0+88.43TOPSOIL 0.13 ΑU 1 1 + 87.43SS 2 79 9 Very stiff to stiff, brown SILTY CLAY SS 3 7 96 0 2 + 86.43159 SS Ρ 4 96 - grey by 2.8m depth 3 + 85.43GLACIAL TILL: Grey silty clay with sand and gravel, occasional cobbles 4 + 84.43and boulders 4.37 End of Borehole Practical refusal to augering at 4.37m depth (GWL @ 0.05m - Dec. 14, 2018) 40 60 80 100 Shear Strength (kPa)

SOIL PROFILE AND TEST DATA

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes LimiteD FILE NO. **PG4026 REMARKS** HOLE NO. **BH 4-18** BORINGS BY CME 55 Power Auger DATE December 5, 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT DEPTH ELEV. Piezometer Construction SOIL DESCRIPTION 50 mm Dia. Cone (m) (m) N VALUE or RQD RECOVERY NUMBER Water Content % **GROUND SURFACE** 80 20 0+88.26**TOPSOIL** 0.30 ΑU 1 1 + 87.26SS 2 83 10 SS 3 88 6 2+86.26 SS 4 Ρ 83 Very stiff to stiff, brown SILTY CLAY 3 + 85.26- firm to stiff and grey by 3.7m depth 4 + 84.265 + 83.266 + 82.26End of Borehole (GWL @ 1.07m - Dec. 14, 2018) 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

DATUM

Ground surface elevations provided by J.D. Barnes LimiteD

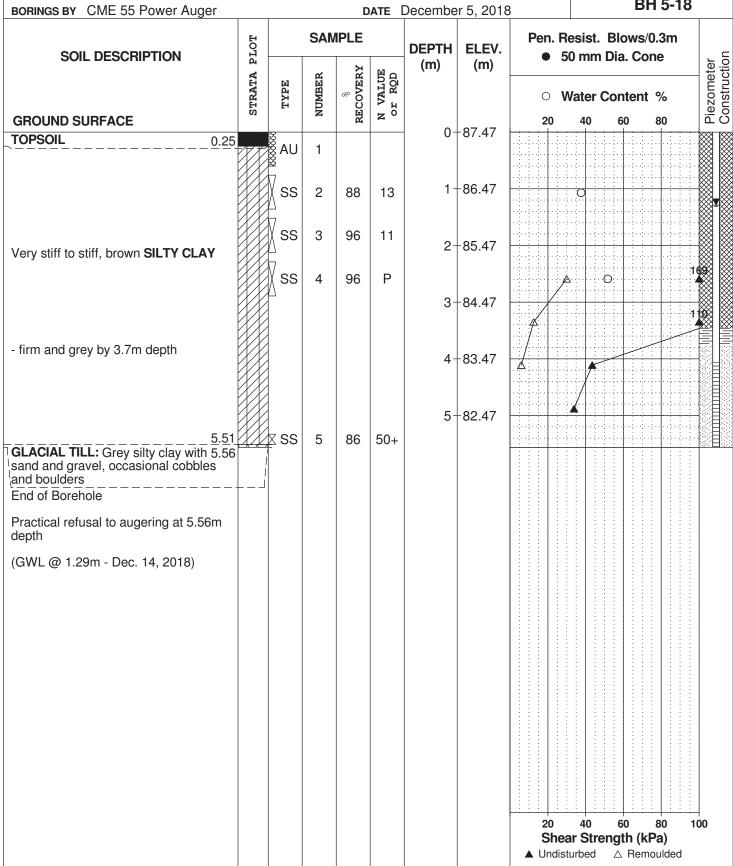
FILE NO.

PG4026

BORINGS BY CME 55 Power Auger

DATE December 5, 2018

BH 5-18



SOIL PROFILE AND TEST DATA

▲ Undisturbed

△ Remoulded

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes LimiteD FILE NO. **PG4026 REMARKS** HOLE NO. **BH 6-18** BORINGS BY CME 55 Power Auger DATE December 6, 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT DEPTH ELEV. Piezometer Construction SOIL DESCRIPTION • 50 mm Dia. Cone (m) (m) N VALUE or RQD RECOVERY NUMBER Water Content % **GROUND SURFACE** 80 20 0 + 87.61Brown SILTY CLAY, some organics0.25 1 trace topsoil 1 + 86.61SS 2 79 11 SS 3 92 6 2+85.61 SS 4 Ρ 96 Very stiff to stiff, brown SILTY CLAY 3 + 84.61Ó - stiff to firm and grey by 3.7m depth 4 + 83.615 + 82.616 + 81.61SS 5 100 Ρ End of Borehole (Piezometer blocked at 0.43m depth - Dec. 14, 2018) 40 60 80 100 Shear Strength (kPa)

SOIL PROFILE AND TEST DATA

40

▲ Undisturbed

Shear Strength (kPa)

60

△ Remoulded

100

Supplemental Geotechnical Investigation 3604-3646 Innes Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

(GWL @ 1.02m - Dec. 14, 2018)

Ottawa, Ontario **DATUM** Ground surface elevations provided by J.D. Barnes LimiteD FILE NO. **PG4026 REMARKS** HOLE NO. **BH 7-18** BORINGS BY CME 55 Power Auger DATE December 6, 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT DEPTH ELEV. Piezometer Construction SOIL DESCRIPTION 50 mm Dia. Cone (m) (m) N VALUE or RQD RECOVERY NUMBER Water Content % **GROUND SURFACE** 80 20 0+86.93**TOPSOIL** 0.15 ΑU 1 1 + 85.93SS 2 79 13 SS 3 92 9 2 + 84.93SS 4 Ρ 88 Very stiff to stiff, brown SILTY CLAY 3 + 83.93- firm to stiff and grey by 3.4m depth 4 + 82.935 + 81.936 + 80.93SS 5 100 Ρ Dynamic Cone Penetration Test commenced at 6.70m depth. Cone 7+79.93pushed to 10.4m depth. 8+78.93 9+77.9310+76.9310.42 End of Borehole Practical DCPT refusal at 10.42m depth

SOIL PROFILE AND TEST DATA

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

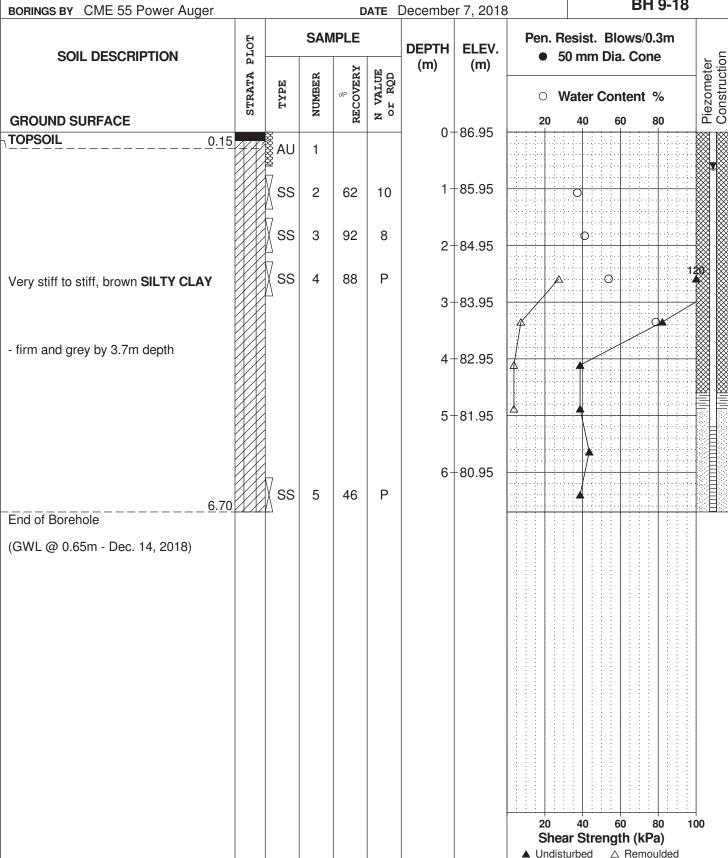
DATUM Ground surface elevations provided by J.D. Barnes LimiteD FILE NO. **PG4026 REMARKS** HOLE NO. **BH 8-18** BORINGS BY CME 55 Power Auger DATE December 6, 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction SOIL DESCRIPTION 50 mm Dia. Cone (m) (m) RECOVERY N VALUE or RQD NUMBER Water Content % **GROUND SURFACE** 80 20 0 + 87.51**TOPSOIL** 0.15 ΑU 1 1 + 86.51SS 2 67 10 SS 3 96 6 Ó 2+85.51 SS 4 Ρ 62 Very stiff to stiff, brown SILTY CLAY 3 + 84.51- firm and grey by 3.8m depth 4 + 83.515 + 82.516 + 81.51SS 5 100 Ρ End of Borehole (Piezometer blocked at 0.48m depth - Dec. 14, 2018) 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes LimiteD FILE NO. **PG4026 REMARKS** HOLE NO. **BH 9-18**



Ground surface elevations provided by J.D. Barnes LimiteD

SOIL PROFILE AND TEST DATA

FILE NO.

PG4026

Supplemental Geotechnical Investigation 3604-3646 Innes Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

REMARKS

DATUM

BORINGS BY CME 55 Power Auger				D	ATE	Decembe	er 7, 2018	3	HOLE NO. BH10-18	}
SOIL DESCRIPTION		PLOT		SAMPLE		DEPTH			Pen. Resist. Blows/0.3m • 50 mm Dia. Cone	
	STRATA E	TYPE	NUMBER	% RECOVERY	VALUE r RQD	(m)	(m)		/ater Content %	Piezometer Construction
GROUND SURFACE	ั้น	-	N	REC	N O N		00.00	20	40 60 80	Cog
Brown SILTY CLAY , trace sand, 0.15	5	AU	1			0-	-86.69			
		ss	2	88	10	1-	85.69		0	
		ss	3	96	7	2-	-84.69			
Very stiff to stiff, brown SILTY CLAY		SS	4	96	Р	3-	-83.69		0 '	96
- firm to stiff and grey by 3.7m depth						4-	-82.69	4		
						5-	-81.69	<u> </u>	4	
6.40 End of Borehole						6-	-80.69			
(Piezometer frozen at 0.5m depth - Dec. 14, 2018)								20	40 60 80 1 ir Strength (kPa)	000

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

DATUM FILE NO. **PG4026 REMARKS** HOLE NO. TP 1 **BORINGS BY** Backhoe DATE August 1, 2017 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT DEPTH ELEV. Piezometer Construction **SOIL DESCRIPTION** • 50 mm Dia. Cone (m) (m) RECOVERY N VALUE or RQD NUMBER Water Content % **GROUND SURFACE** 80 20 0 **TOPSOIL** <u>0</u>.<u>1</u>0 1 G 1 Hard to stiff, brown SILTY CLAY G 2 2 G 3 Ó 2.50 ⊻ Stiff to firm, grey-brown SILTY **CLAY** G 4 Ó 3 3.10 End of Test Pit (GWL @ 2.5m depth based on field observations) 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

DATUM									FILE	NO.	G4026	;
REMARKS						HOLE	E NO. TI	P 2				
BORINGS BY Backhoe)ATE	August 1,	2017					
SOIL DESCRIPTION	PLOT		SAN	/IPLE		DEPTH (m)	ELEV. (m)			Blows/ Dia. Co		er
	STRATA	TYPE	NUMBER	RECOVERY	N VALUE or RQD	(,	(,	0 V	Vater (Content	%	Piezometer Construction
GROUND SURFACE	ST	H	N	REC	NON			20	40	60	80	Piez Con
TOPSOIL 0.15						0-	_					
<u>\$</u>												
			_			1-	_		0			
		_ G	1									260
Hard to stiff, brown SILTY CLAY		G	2						0			
		G	3			2-	_		: O			Ā
												-
												.
2.75		-										
Stiff to firm, grey SILTY CLAY												
		G	4			3-				0		-
End of Test Pit												
(GWL @ 2.0m depth based on field observations)												
observations)												
								20	40	60		□ 1 00
										ength (k △ Rem		

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa, Ontario

DATUM									FILE	NO.	G4026	
REMARKS							HOLE	- NO				
BORINGS BY Backhoe				August 1,	2017			- 11	3			
SOIL DESCRIPTION	PLOT			IPLE	FI -	DEPTH (m)	ELEV. (m)			Blows/ODia. Co		ter tion
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD					Content		Piezometer Construction
GROUND SURFACE TOPSOIL 0.10				24	4	0-	_	20	40	60	80	<u> </u>
Hard to stiff, brown SILTY CLAY		_ G _ G _ G	1 2 3			2-	_		0		20	₩ ₩
Stiff to firm, grey SILTY CLAY		_ G	4			3-					D	
End of Test Pit												
(GWL @ 2.6m depth based on field observations)								20	40	60	80 10	000
				ır Stre	ength (kl △ Rem	Pa)						

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road Ottawa Ontario

DATUM						itaria, Oi			FILE NO. PG4026
REMARKS							0047		HOLE NO. TP 4
BORINGS BY Backhoe					ATE .	August 1,	2017		
SOIL DESCRIPTION	PLOT		SAN	/IPLE		DEPTH (m)	ELEV. (m)	1	esist. Blows/0.3m 0 mm Dia. Cone
	STRATA	TYPE	NUMBER	% RECOVERY	VALUE r RQD			0 V	Vater Content % 40 60 80
GROUND SURFACE	SI	H	N	REC	N C			20	40 60 80 Z G
TOPSOIL 0.15						0-	_		
Hard to stiff, brown SILTY CLAY		GGGG	1 2 3			2-	_		O 260
Stiff to firm, grey-brown SILTY CLAY End of Test Pit		G	4			3-	_		O O
(GWL @ 2.0m depth based on field observations)								20 Shea	40 60 80 100 ar Strength (kPa) turbed △ Remoulded

patersongroupConsultingEngineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation 3604-3646 Innes Road
Ottawa, Ontario

DATUM						itarra, Oi			FILE NO.	PG4026	
REMARKS									HOLE NO		
BORINGS BY Backhoe					ATE A	August 1,	2017				
SOIL DESCRIPTION	PLOT			IPLE >	E.	DEPTH (m)	ELEV. (m)		esist. Blo 0 mm Dia		ter
	STRATA	TYPE	NUMBER	% RECOVERY	VALUE r RQD			0 W	/ater Con	tent %	Piezometer Construction
GROUND SURFACE	, s	•	Z	REC	N V	0-	_	20	40 60	0 80	Se Pie
TOPSOIL 0.1	5										
Hard to stiff, brown SILTY CLAY 3.0		G G G	1 2 3			2-	-		Φ	224	. □
End of Test Pit	0////	1									
(GWL @ 2.8 depth based on field observations)								20	40 60	0 80 10	000
									r Strengt		UU



Page 1 de 1

Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin: 2013-06-27

HAC

HAP

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5191369842 °O Y = 45.4458564224 °N

Élévation surface : 90.69 m ()

Élévation margelle :

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

Diamètre du forage : 200 mm Fluide forage: Aucun

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

ODEUR TYPE D'ÉCHANTILLON F - Faible odeur M - Odeur moyenne P - Odeur persistante CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston

TC - Tube creux TM - Tarière manuelle VISUEL D - Produit disséminé S - Sol saturé de produit TR - Truelle TS - Tube Shelby TT - Tube transparent

Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX COT C. Inorg.

ANALYSES CHIMIQUES

Carbone organique total $\begin{array}{ll} \text{Autres composés inorganiques} \\ \text{(cyanure, fluorure, bromure, soufre} \\ \text{Mercure} \end{array}$ Métaux C. Phénol. Composés phénoliques

COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes

monocycliques
Hydrocarbures aromatiques
polycycliques
Hydrocarbures pétroliers C₁₀-C₅₀
Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀) Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques

Équip. d'échantill		I	GÉOLOGIE / STRATIGRAPHIE		eau d'ea		Phas	e libre	ÉCŀ	HANTILLONS	Dioxines et furar			MD Lixiviation (ma	ie, cuivre, étain, molybdène, nickel, um, zinc. at. dangereuses)
ÉLÉV	ATION	STRATIGRAPHIE	DESCRIPTION		ONC. VAPEUR pm OU % LIE)	ODEUR	TYPE	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.												
+	0.10 90.59	Remblai : Gravier sableux sec.													
-			Remblai : Gravier sableux sec.	-			CF	82	11 6 6 11	F-01 (0.30-0.40)	HP F1-F4		-		
.5 - - -	0.50 90.19		Sol naturel : Gravier sableux.							F-01 (0.40-0.50) F-01 (0.50-0.91)	HP F1-F4 HAP BTEX Métaux (R153)				0.
.0 —		1.06		-			CF	33	15 R/1.06)					1.
-	89.63														Refus à 1.06 m sur bloc ou roc.
- 5 —		Fin du forage à 1.06 m de profondeu													1
-															
- 0 -															2
- - 5 -															2
-															
- - -															3
-															
5 - -															3
1															



HAC

Page 1 de 1

Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin: 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5189257577 °O Y = 45.445930007 °N

Élévation surface : 90.64 m ()

Élévation margelle :

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

Diamètre du forage : 200 mm Fluide forage: Aucun

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

Équip. d'échantillonnage : Carottier fendu

ODEUR TYPE D'ÉCHANTILLON F - Faible odeur M - Odeur moyenne P - Odeur persistante CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston

TC - Tube creux TM - Tarière manuelle VISUEL D - Produit disséminé S - Sol saturé de produit TR - Truelle TS - Tube Shelby TT - Tube transparent ANALYSES CHIMIQUES Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX ber izene, toluène, éthylbenzène, xylène
xylène
Carbone organique total
Autres composés inorganiques
(cyanure, fluorure, bromure, soufre
total)

HP F1-F4
Mercure

Mercure

Mercure

Mercure

Mercure

monocycliques

monocycliques
HP C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Mercure

Mercure COT C. Inorg.

Métaux C. Phénol. Composés phénoliques Hydrocarbures HAM et HAC Dioxines et furanes COV

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

		Jilailillioi	inage : Carottier fendu	⊽и	iveau d'e	au	7	Phas	se libre		Diox. & Fur.	Dioxines et furan	ies	RM	plomb, séléni MD Lixiviation (m:	um, zinc. at. dangereuses)
			GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	IONS			ÉC	HANTILLONS			PUITS D	O'OBSERVATION	
ÉLÉV	<u>NDEUR</u> ATION n)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	ODEUR	NSNEL	£	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.													
-	0.10 90.54	×××××	Asphalte.													
-	90.54		Remblai : Gravier sableux brun gris sec).												
							CF	41	3	F-02						
0.5 —	0.45 0.55								3 11 9 6	(0.30-0.45) F-02	HP F1-F4				0.	
-	90.09									(0.45-0.55) F-02	HP F1-F4 HAP Métaux (R153) HP F1-F4 HAP BTEX					
1	0.75 89.89				-					(0.55-0.75) F-02	HP F1-F4 HAP BTEX	—				
-		。 () °	Sol naturel : Sable graveleux.			-		\vdash			(0.75-0.91)	BIEX				
.0 —		0 0						CF	66	6 R/1.2	F-02 (0.91-1.02)			-		1
4	1.21 89.43	0 (F-02 (1.02-1.12)]		
-	09.43		Fin du forage à 1.21 m de profondeur.													Refus à 1.21 m sur bloc ou roc.
5 —																1
-																
-																
_																
.0 —																2
_																
-																
_																
.5 - -																2
-																
_																
.0—																3
-																
_																
-																
5 —																3
-																
-																
					1	1		1	1	1	I		1	I .	1	I



HAC

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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin: 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5196137735 °O Y = 45.4456012321 °N

Élévation surface : 90.39 m ()

Élévation margelle :

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

Diamètre du forage : 200 mm Fluide forage: Aucun

Équip. d'échantillonnage : Carottier fendu

ODEUR TYPE D'ÉCHANTILLON ANALYSES CHIMIQUES F - Faible odeur M - Odeur moyenne P - Odeur persistante CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston BPC BTEX

TC - Tube creux TM - Tarière manuelle VISUEL D - Produit disséminé S - Sol saturé de produit TR - Truelle TS - Tube Shelby

Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total COT C. Inorg. C. Phénol. Composés phénoliques TT - Tube transparent

Hydrocarbures HAM et HAC Dioxines et furanes COV

ber izene, toluène, éthylbenzène, xylène
xylène
Carbone organique total
Autres composés inorganiques
(cyanure, fluorure, bromure, soufre
total)

HP F1-F4
Mercure

Mercure

Mercure

Mercure

Mercure

monocycliques

monocycliques
HP C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Mercure

Mercure Métaux

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques

_qa.p. a o.	criaritino	nnage : Carottier fendu	∑ 1	Niveau d'e	au	3	Phas	e libre		Diox. & Fur.	Dioxines et furar	nes	R	plomb, séléni MD Lixiviation (ma	um, zinc. at. dangereuses)
		GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	IONS			ÉCI	HANTILLONS			PUITS I	D'OBSERVATION	
PROFONDEUR ÉLÉVATION (m)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	™ ODEUR	NSUEL		% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
		Surface du terrain.													
0.10 90.29	×××××	_ Asphalte.													
0.30		Remblai : Gravier sableux sec.													
90.09	000					CF	49	12 5 5 3	F-03 (0.30-0.50)	HP F1-F4 HAP					
0.50 89.89		Sol naturel : Sable silteux avec trace of gravier.	de		-				5 3	F-03 (0.50-0.91)	Métaux (R153)				0
.0 — 89.48		Sol naturel : Sable silteux.					CF	33		F-03					1
-										(0.91-1.01) F-03 (1.01-1.11)	HAP		_		
.5 — <u>1.52</u> 88.87		Fin du forage à 1.52 m de profondeur.		4											1
2.0—															2
.5 —															2
-															
.0 —															;
- - .5 —															
- - -															



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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin : 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

3636-3646, chemin Innes, Orléans (Ontario) Secteur:

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5201167458 °O Y = 45.4451939281 °N

Élévation surface : 89.29 m ()

Élévation margelle :

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

Diamètre du forage : 200 mm Fluide forage : Aucun

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

ODEUR TYPE D'ÉCHANTILLON F - Faible odeur M - Odeur moyenne P - Odeur persistante CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston BPC BTEX

TC - Tube creux TM - Tarière manuelle VISUEL TR - Truelle
TS - Tube Shelby
TT - Tube transparent D - Produit disséminé S - Sol saturé de produit

COT C. Inorg. C. Phénol. Composés phénoliques Hydrocarbures HAM et HAC

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques ANALYSES CHIMIQUES HAC Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total benzene, toluene, ethylbenzène, xylène Bernzène, toluene, ethylbenzène, toluene, ethylbenzène, toluene, ethylbenzène, toluene, t

Métaux

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain,

Équ	89.29 0.20 89.09 		nnage : Carottier fendu	¥ Ni	veau d'e		:	▼ Pha	se libre			Hydrocarbures I Dioxines et furar	HAM et nes	RI	MD Lixiviation (m	ne, cuivre, étain, molybdène, nickel, ium, zinc. at. dangereuses)
			GÉOLOGIE / STRATIGRAPHIE		OBSE	RVA	TIONS	3		ÉCI	HANTILLONS			PUITS	O'OBSERVATION	
		STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	ODEUR	IP D	\	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.													
-			Remblai : Sable graveleux gris et bland	С.				CF	74	85 55 30 18	F-04 (0.00-0.20)					
- - 0.5 -	89.09		Remblai : Gravier sableux saturé								F-04 (0.20-0.61)					0.5
-0.		Sof naturer . Argile sliteuse brune grise.						CF	90	1 1 2 6	F-04 (0.61-1.22)	HP F1-F4 HAP BTEX				1.0
-	1.22 88.07	Fin du forage à 1.22 m de profondeur.														Refus à 1.22 m sur bloc ou roc.
.5 —		Fin du forage à 1.22 m de profondeur.													2.	
- .5 - -																2.
- 3.0 - -																3.
- 5 - -																3
_																



HAC

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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin : 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site: Site # 38 Orléans

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client : La Coop fédérée

Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5198284892 °O Y = 45.4453512328 °N

Élévation surface : 89.21 m ()

Élévation margelle :

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

Diamètre du forage : 200 mm Fluide forage : Aucun

Équip. d'échantillonnage : Carottier fendu

ODEUR
F. Faible odeur
M. Odeur moyenne
P - Odeur persistante
PS - Échantillomeur à piston

TYPE D'ÉCHANTILLON
ANALYSES CHIMIQUES
BPC Biphényles poli
BTEX Berzène, tolué
yéne

▼ Phase libre

VISUEL
D - Produit disséminé
S - Sol saturé de produit
TT - Tube Shelby
TT - Tube transparent

BPC Biphényles polychlorés HAM

BTEX Benzène, toluène, éthylbenzène, sylène

COT Carbone organique total
C. Inorg. Autres composés inorganiques (cyanure, fluorure, bromure, soufre total)

C. Phénol Composés phénoliques Métaux

C. Phénol. Composés phénoliques COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques Hydrocarbures aromatiques polycycliques Hydrocarbures pétroliers C₁₀-C₅₀ Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀)

Mercure
Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

				<u>*</u> N	iveau d'e			- Phas	e libre					R/		at. dangereuses)
			GÉOLOGIE / STRATIGRAPHIE		OBSE	RVATI	ONS	<u> </u>	_	ÉCI	HANTILLONS			PUITS D	'OBSERVATION	
PROFON ÉLÉVAT (m)	TION	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	ODEUR		CH	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.			П	П									
-	89. <i>21</i> 0.20		Remblai : Sable et gravier sec					CF	66	58 69 21 18	F-05 (0.00-0.20)					
0.5 —	0.61		c un						18	F-05 (0.20-0.61)					0	
- 0.1	88.60		Sol naturel : Argile silteuse brune-beige humide.	e et				CF	100	1 1 5 6	F-05 (0.61-1.22)					1
1.5 —	1.02					-		CF	100		F-05 (1.22-1.32) F-05 (1.32-1.83)	HP F1-F4 HAP BTEX Métaux (R153)				1
2.0	1.83 87.38 2.10		Sol naturel : Argile silteuse grise humic	de.				CF	82	3 8 22 8	F-05 (1.83-2.10)					2
1	87.11 2.34 86.87		Sol naturel : Gravier sableux gris.								F-05 (2.10-2.34)					
2.5 -	50.87	Roc atteint	Fin du forage à 2.34 m de profondeur.													2
3.0 —																3
3.5 -																3
4.0																



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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin : 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site: Site # 38 Orléans

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client : La Coop fédérée

Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5200570318 °O Y = 45.4478309683 °N

Élévation surface : 89.22 m ()

Élévation margelle :

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

Diamètre du forage : 200 mm Fluide forage : Aucun

Équip. d'échantillonnage : Carottier fendu

ODEUR
F - Faible odeur
M - Odeur moyenne
P - Odeur persistante
PS - Échantillonneur à piston

VISUEL
D - Produit disséminé
S - Sol saturé de produit
TT - Tube Shelby
TT - Tube transparent

▼ Phase libre

ANALYSES CHIMIQUES HAC
BPC Biphérnyles polychlorés
BTEX Benzène, toluène, éthylbenzène, xylène
COT Carbone organique total
C. Inorg. Autres composés inorganiques (cyanure, fluorure, bromure, soufre total)
Mercure
Mercure

(cyanure, fluorure, bromure, soufre Mercure total)

C. Phénol. Composés phénoliques Métaux

COV Hydrocarbures HAM et HAC

Diox. & Fur. Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques Hydrocarbures aromatiques polyocitiques Hydrocarbures pétroliers C₁₀-C₅₀ Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀)

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

				¥ Ni	veau d'e			- Phas	e libre					RM		at. dangereuses)
			GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	IONS	-	_	ÉCI	HANTILLONS			PUITS D	'OBSERVATION	
PROFON ÉLÉVA (m)	TION	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	™ ODEUR	1.] S	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.			П	П									
	89.22		Remblai : Sable graveleux gris-brun et sec.					CF	100	1 3 4 7	F-06 (0.00-0.61)	HP F1-F4 HAP BTEX				0
1.0	<u>0.61</u> 88.61		Sol naturel : Argile silteuse grise.			-		CF	100	1 4 4 6	F-06 (0.61-1.22)					1
-	87.70 1.83							CF	49	56 36 19 10	F-06 (1.22-1.83)					1
2.0 —			Fin du forage à 1.52 m de profondeur.													2
2.5 —																2
3.0																3
3.5 —																3
4.0																



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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin: 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5199577902 °O Y = 45.4476971365 °N

Élévation surface : 89.47 m ()

Élévation margelle :

F-07 0.50-0.61

F-07

(0.61-1.22)

F-07 (1.22-1.83)

HP F1-F4 HAP BTEX

Entrepreneur forage: Marathon Drilling Co. Ltd.

CME 75 Type de foreuse :

Équipement de forage : Tarière tige pleine /

200 mm Diamètre du forage : Fluide forage:

0.

87.95

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

2.0

2.5

3.0

Équip. d'échantillonnage : Carottier fendu

TYPE D'ÉCHANTILLON ODEUR F - Faible odeur M - Odeur moyenne P - Odeur persistante CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston

TC - Tube creux TM - Tarière manuelle VISUEL D - Produit disséminé S - Sol saturé de produit TR - Truelle TS - Tube Shelby TT - Tube transparent

Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène BPC BTEX COT C. Inorg. Carbone organique total Autres composés inorganiques (cyanure, fluorure, bromure, soufre total) HP C₁₀-C₅₀ HP F1-F4 Mercure C. Phénol. Composés phénoliques COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes

ANALYSES CHIMIQUES

HAC HAM HAP Métaux

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques Hydrocarbures aromatiques polycycliques
Hydrocarbures pétroliers C₁₀-C₅₀ Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

Equip. a ed	Jilanillioi	mage . Carottier lendu	∑ Ni	iveau d'ea	au	y	Phas	e libre		Diox. & Fur.	Dioxines et furan	ies	RN		um, zinc. at. dangereuses)
		GÉOLOGIE / STRATIGRAPHIE		OBSE	RVATI	ONS			ÉCH	IANTILLONS			PUITS D	'OBSERVATION	
PROFONDEUR ÉLÉVATION (m)	TRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	ODEUR	VISUEL	TYPE	RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
	ò			00	FMF	DS		%							
		Surface du terrain.													
89.47		Remblai : Sable graveleux gris-blanc et sec.	t				CF	57	110 54 13	F-07 (0.00-0.50)					

CF

CF

-	0.50			
i.5 — -	0.60	Remblai : Sable graveleux gris-blanc et	7	

Sol naturel: Argile silteuse.

1.83 Fin du forage à 1.52 m de profondeur.

3.5



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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin: 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5196453839 °O Y = 45.4472729549 °N

Élévation surface : 89.2 m ()

Élévation margelle :

C. Phénol.

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

200 mm Diamètre du forage : Fluide forage: Aucun Équip. d'échantillonnage :

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

ODEUR F - Faible odeur M - Odeur moyenne P - Odeur persistante

VISUEL D - Produit disséminé S - Sol saturé de produit TT - Tube transparent

TYPE D'ÉCHANTILLON CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston TC - Tube creux TM - Tarière manuelle TR - Truelle TS - Tube Shelby

ANALYSES CHIMIQUES HAC Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX ber izene, toluène, éthylbenzène, xylène
xylène
Carbone organique total
Autres composés inorganiques
(cyanure, fluorure, bromure, soufre
total)

HP F1-F4
Mercure

Mercure

Mercure

Mercure

Mercure

monocycliques

monocycliques
HP C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Mercure

Mercure COT C. Inorg.

Composés phénoliques

Métaux COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

Équip. d'éd	chantillon		∑ Ni	veau d'e				se libre		Diox. & Fur.	Hydrocarbures F Dioxines et furan	nes	RN		molybdène, nickel, um, zinc. at. dangereuses)
		GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	IONS	3		ÉCH	ANTILLONS			PUITS D	'OBSERVATION	
PROFONDEUR ÉLÉVATION (m)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	M ODEUR	NSUE		% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
		Surface du terrain.													
0.10 89.10		Remblai : Argile graveleuse.			$\left\{ \right\}$		CF	41	2						
0.5 —		Remblai : Sable graveleux gris.							2 11 8 22		HP F1-F4 HAP BTEX				0.5
0.61 88.59 		Fin du forage à 0.61 m de profondeur.			-										Refus à 0.61 m sur bloc ou roc.
1.0 —															1.0
- 1.5 — - -															1.5
2.0															2.0
2.5 —															2.5
3.0—															3.0 -
- - 3.5 — -															3.5
4.0															4.0



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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier 2013-06-27 Date fin:

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00 Coordonnées géographiques : X = 75.5190143537 °O Y = 45.4460829513 °N

89.71 m () Élévation surface :

Élévation margelle :

C. Phénol.

Entrepreneur forage: Marathon Drilling Co. Ltd.

CME 75 Type de foreuse :

Équipement de forage : Tarière tige pleine /

200 mm Diamètre du forage : Fluide forage: Aucun Équip. d'échantillonnage :

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

TYPE D'ÉCHANTILLON ODEUR F - Faible odeur M - Odeur moyenne P - Odeur persistante

VISUEL D - Produit disséminé S - Sol saturé de produit

CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston Tube creux TM - Tarière manuelle TR - Truelle TS - Tube Shelby TT - Tube transparent

▼ Phase libre

HAC ANALYSES CHIMIQUES Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène HAP COT C. Inorg. Carbone organique total Autres composés inorganiques (cyanure, fluorure, bromure, soufre total)

Hydrocarbures aromatiques polycycliques
Hydrocarbures pétroliers C₁₀-C₅₀ HP C₁₀-C₅₀ HP F1-F4 Mercure Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀) Métaux Composés phénoliques COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes

RMD

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc. Lixiviation (mat. dangereuses)

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques

GÉOLOGIE / STRATIGRAPHIE OBSERVATIONS ÉCHANTILLONS PUITS D'OBSERVATION % RÉCUPÉRATION STRATIGRAPHIE CONC. VAPEUR (ppm OU % LIE) TYPE ÉCHANTILLON PROFONDEUR VISUEL N (Coups/6") DUPLICATA DIAGRAMME ODEUR ANALYSES DESCRIPTION NUMÉRO DESCRIPTION REMARQUES ÉLÉVATION (m) FMPDS Surface du terrain. DUP HP F1-F4 Remblai: Sable et gravier. Gris blanc sec CF 74 HAP BTEX devenant humide. 0.5 0.5 0.61 89.10 Sol naturel : Argile silteuse avec un peu CF 25 1234 de sable humide. 1.0 CF 100 1.5 88.19 1.83 Fin du forage à 1.52 m de profondeur. 2.0 2.0 2.5 2.5 3.0 3.0 3.5 3.5



HAC

HAP

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Préparé par : Catherine Tardy Laporte Date début : 2013-06-27 Vérifié par : Annie Gauthier Date fin: 2013-06-27

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00 Coordonnées géographiques : X = 75.5189110706 °O

Y = 45.446095328 °N Élévation surface : 89.99 m () Élévation margelle : 89.99 m ()

Entrepreneur forage: Marathon Drilling Co. Ltd.

Type de foreuse : CME 75

Équipement de forage : Tarière tige pleine /

200 mm Diamètre du forage : Fluide forage: Aucun

Équip. d'échantillonnage : Carottier fendu

ODEUR F - Faible odeur M - Odeur moyenne P - Odeur persistante

VISUEL D - Produit disséminé S - Sol saturé de produit

TYPE D'ÉCHANTILLON CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston TC - Tube creux TM - Tarière manuelle TR - Truelle TS - Tube Shelby

TT - Tube transparent

▼ Phase libre

Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX COT C. Inorg. Autres composés inorganiques (cyanure, fluorure, bromure, soufre total) C. Phénol. Composés phénoliques

ANALYSES CHIMIQUES

HP C₁₀-C₅₀ HP F1-F4 Mercure Métaux COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques monocycliques
Hydrocarbures aromatiques
polycycliques
Hydrocarbures pétroliers C₁₀-C₅₀
Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀)

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

				-¥- IV	liveau d'e			¥ Pha:	se libre							it. dangereuses)
			GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	IONS	3		ÉC	HANTILLONS			PUITS E	O'OBSERVATION	
PROFONE ÉLÉVAT (m)	TION	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	™ ODEUR	VISUEL		% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.													
0.5 —	39.99		Remblai : Sable graveleux gris avec to d'oxydation.	race				CF	57	60 55 35 22	PO-01 (0.00-0.61)			→	Margelle ■ Bentonite Tube PVC ■ Sable	0.
- <u>(</u>	0.61 89.38 0.86		Sol naturel : Argile silteuse brune.			-		CF	90	2686	PO-01 (0.61-0.86)	HP F1-F4 HAP BTEX Métaux (R153)				
1.0 —	39.13 1.22 38.77		Sol naturel : Sable silteux humide.			_					PO-01 (0.86-1.22)				CRÉPINE CPV Diam.: 30 mm Ouv.: 0.25 mm Long.: 1.52 m	1.
1.5 —	1.83		Sol naturel : Argile silteuse grise et humide.					CF	100	2 2 4 6	PO-01 (1.22-1.83)				EAU Prof.: 0.48 m Élév.: 89.46 m Date: 2013-07-08	1.
2.0 —	37.91		Fin du forage à 2.08 m de profondeur												Bouchon	2
2.5 —																2.
3.0 —																3.
3.5 —																3
4.0																



RAPPORT DE TRANCHÉE: TE-01

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2013-07-02

Date début : 2013-07-02

Date fin:

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site: Site # 38 Orléans

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client : La Coop fédérée

Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5199533185 °O Y = 45.4457572743 °N

Élévation surface : 89.57 m ()

Préparé par : Catherine Tardy Laporte

Vérifié par : Annie Gauthier

Élévation margelle :

Entrepreneur forage : Denis Ladouceur Excavation Ltée ODEUR

Type de foreuse : Rétrocaveuse Équipement de forage : Manuelle /

Diamètre du forage : Fluide forage :

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

Équip. d'échantillonnage : Carottier fendu

tée

F - Faible odeur

M - Odeur moyenne
P - Odeur persistante

VISUEL D - Produit disséminé S - Sol saturé de produit

TYPE D'ÉCHANTILLON
CD - Carottier à diamants
CF - Cuillère fendue
PS - Échantillonneur à piston
TC - Tube creux
TM - Tarière manuelle
TR - Truelle
TS - Tube Shelby

TT - Tube transparent

▼ Phase libre

ANALYSES CHIMIQUES HAC
BPC Biphényles polychlorés
BTEX Benzène, toluène, éthylbenzène, yléne
COT Carbone organique total
C. Inorg. Autres composés inorganiques
(cyanure, fluorure, bromure, soufre
Mercure
Mercure

(cyanure, nuorure, promure, sourre fucial)

C. Phénol. Composés phénoliques Métaux
COV Hydrocarbures HAM et HAC
Diox. & Fur. Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques Hydrocarbures aromatiques polycycliques Hydrocarbures pétroliers C₁₀·C₅₀ Hydrocarb. pétrol. F1-F4 (C₁₀·C₅₀)

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.
Lixiviation (mat. dangereuses)

				-¥- IVI	iveau d'e			¥ Pha:	se libre							it. dangereuses)
			GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	TIONS	-	7	EC	HANTILLONS			PUITS	O'OBSERVATION	
<u>PROFO</u> ÉLÉV (r	NDEUR ATION n)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	M ODEUR	VISUEL]. 옷	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
			Surface du terrain.													
-	0.30		Remblai : Gravier sableux avec trace de silt. Gris et humide.	Э				TR			TE-01 (0.00-0.30)					
0.5 —	0.60		Remblai : Silt sableux brun avec trace d matière résiduelle (bois brûlé).	le							TE-01 (0.30-0.60)	HP F1-F4 HAP BTEX Métaux (R153)				0.5
-	1.00		Infiltration d'eau à 0.6 m. Sol naturel : Silt argileux gris humide.								TE-01 (0.60-1.00)	(60)				
1.0 -	88.57		Sol naturel : Silt sableux graveleux avec trace d'argile. Gris humide.	5							TE-01 (1.00-3.50)			•		1.0
- 1.5 - - -																1.5
- 2.0 -																2.0
2.5 — -																2.5
3.0 —																3.0
3.5 -	3.50 86.07	Roc atteint	<i>≺_Infiltration d'eau.</i> Fin de la tranchée			_										3.4
1.0		allenil														4.0



RAPPORT DE TRANCHÉE: TE-02

Page 1 de 1

Préparé par : Catherine Tardy Laporte Date début : 2013-07-02 Vérifié par : Annie Gauthier Date fin: 2013-07-02

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5205637155 °O Y = 45.4458202359 °N

Élévation surface : 89.59 m ()

Élévation margelle :

Entrepreneur forage: Denis Ladouceur Excavation Ltée ODEUR Type de foreuse :

Équipement de forage : Manuelle / Diamètre du forage :

Fluide forage:

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

Équip. d'échantillonnage : Carottier fendu

F - Faible odeur M - Odeur moyenne P - Odeur persistante Rétrocaveuse

> VISUEL D - Produit disséminé S - Sol saturé de produit

CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston TC - Tube creux TM - Tarière manuelle TR - Truelle TS - Tube Shelby TT - Tube transparent

▼ Phase libre

TYPE D'ÉCHANTILLON

ANALYSES CHIMIQUES HAC Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX HAP COT C. Inorg. HP C₁₀-C₅₀ HP F1-F4 Mercure Autres composés inorganiques (cyanure, fluorure, bromure, soufre total)

Métaux C. Phénol. Composés phénoliques COV Hydrocarbures HAM et HAC Diox. & Fur. Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques monocycliques
Hydrocarbures aromatiques
polycycliques
Hydrocarbures pétroliers C₁₀-C₅₀
Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀)

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

			-¥- N	veau d'e		- Phas	e libre	<u> </u>				RN		it. dangereuses)
PROFONDEUR	PHE	GÉOLOGIE / STRATIGRAPHIE		OBSE OBSE		NO.	ATION		HANTILLONS	g	4		OBSERVATION	
ÉLÉVATION (m)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	F M I	TYPE	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
		Surface du terrain.												
89.59 - - 0.35 - 89.24		Remblai : Matière résiduelle (55%) (brique, bois, bois brûlé et plastique) et sableux avec trace de matière organiqu Brun humide.				TR			TE-02 (0.00-0.35)	HP F1-F4 HAP BTEX Métaux (R153)				
- 89.24 0.5		Sol naturel : Silt avec un peu de sable e trace de matière organique.	et						TE-02 (0.35-1.00)	HP F1-F4 HAP BTEX Métaux (R153)				0.5
1.00	4444444													1.0
88.59		Sol naturel : Silt argileux avec traces de gravier brun-beige.	:						TE-02 (1.00-1.45)	HP F1-F4 HAP BTEX Métaux (R153)				
1.45 1.5 — 88.14		Sol naturel : Silt argileux gris avec trace de gravier.	es						TE-02 (1.45-3.30)					1.5
2.0 —														2.0
- 2.5 - - -														2.5
3.0 —														3.0
3.30 86.29 3.5 —	Roc atteint	<i>∖Infiltration d'eau.</i> Fin de la tranchée												3.5
4.0														4.6



RAPPORT DE TRANCHÉE : TE-03

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2013-07-02

Date début : 2013-07-02

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5206801071 °O Y = 45.4461519033 °N

Élévation surface : 88.98 m ()

Préparé par : Catherine Tardy Laporte

Vérifié par : Annie Gauthier

Élévation margelle :

Entrepreneur forage: Denis Ladouceur Excavation Ltée ODEUR Type de foreuse : Rétrocaveuse

Équipement de forage : Manuelle / Diamètre du forage :

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

Fluide forage: Équip. d'échantillonnage : Carottier fendu F - Faible odeur M - Odeur moyenne P - Odeur persistante

VISUEL D - Produit disséminé S - Sol saturé de produit

TYPE D'ÉCHANTILLON CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston TC - Tube creux TM - Tarière manuelle TR - Truelle TS - Tube Shelby

ANALYSES CHIMIQUES Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX ber izene, toluène, éthylbenzène, xylène
xylène
Carbone organique total
Autres composés inorganiques
(cyanure, fluorure, bromure, soufre
total)

HP F1-F4
Mercure

Mercure

Mercure

Mercure

Mercure

monocycliques

monocycliques
HP C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Mercure

Mercure COT C. Inorg. C. Phénol. Composés phénoliques

Métaux

HAC

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques Mercure

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc.

Fluide fora Équip. d'é		nnage : Carottier fendu		iveau d'e		Π.		anspare	nt	COV	Composés phér Hydrocarbures H Dioxines et furar	HAM et 1	HAC	étaux Argent, arser cobalt, chrom manganèse, plomb, séléni	ic, baryum, cadmium, ie, cuivre, étain, molybdène, nickel, um, zinc.
	ı	GÉOLOGIE / STRATIGRAPHIE	1	OBSE				oc iibi c	ÉCI	HANTILLONS			RN PUITS D	MD Lixiviation (m:	at. dangereuses)
PROFONDEUR ÉLÉVATION (m)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	ODEUR		TYPE	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO O O O O O O O O O O	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
		Surface du terrain.			Ħ										
88.98		Remblai : Gravier sableux gris saturé. Eau à la surface.					TR			TE-03 (0.00-0.30)					
88.68 0.5 –		Sol naturel : Silt argileux gris humide.								TE-03 (0.30-1.00)	HP F1-F4 HAP	DUP8			0.5
1.0 87.98 		Sol naturel : Silt avec un peu d'argile q humide.	gris							TE-03 (1.00-2.60)					1.0-
2.0—															2.0
2.5 – 2.60 86.38		Fin de la tranchée													2.5
3.0 —	Roc atteint														3.0
3.5 —															3.5
4.0															4.0



RAPPORT DE TRANCHÉE: TE-04

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2013-07-02

Préparé par : Catherine Tardy Laporte Date début : 2013-07-02 Vérifié par : Annie Gauthier

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site # 38 Orléans Site:

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client: La Coop fédérée Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5202005926 °O Y = 45.4465543177 °N

Élévation surface : 90.77 m ()

Élévation margelle :

COV

Entrepreneur forage: Denis Ladouceur Excavation Ltée ODEUR

Type de foreuse : Rétrocaveuse Équipement de forage : Manuelle /

Diamètre du forage : Fluide forage:

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

Équip. d'échantillonnage : Carottier fendu

F - Faible odeur M - Odeur moyenne P - Odeur persistante

VISUEL D - Produit disséminé S - Sol saturé de produit

TYPE D'ÉCHANTILLON CD - Carottier à diamants CF - Cuillère fendue PS - Échantillonneur à piston TC - Tube creux TM - Tarière manuelle TR - Truelle TS - Tube Shelby

TT - Tube transparent

ANALYSES CHIMIQUES HAC Biphényles polychlorés Benzène, toluène, éthylbenzène, xylène Carbone organique total BPC BTEX ber izene, toluène, éthylbenzène, xylène
xylène
Carbone organique total
Autres composés inorganiques
(cyanure, fluorure, bromure, soufre
total)

HP F1-F4
Mercure

Mercure

Mercure

Mercure

Mercure

monocycliques

monocycliques
HP C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Hydrocarbures pétroliers C₁₀·C₅₀
Mercure

Mercure COT C. Inorg. C. Phénol.

Métaux Composés phénoliques Hydrocarbures HAM et HAC Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques

Mercure

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, sélénium, zinc

Equip. u e	CHaritiiloi	nnage : Carottier fendu	∇ N	iveau d'e	au	¥	Phas	e libre		Diox. & Fur.	Dioxines et furan	nes	R/	plomb, séléni //D Lixiviation (ma	includene, nickel, um, zinc. at. dangereuses)
		GÉOLOGIE / STRATIGRAPHIE		OBSE	RVAT	IONS			ÉCI	HANTILLONS				OBSERVATION	
PROFONDEUR ÉLÉVATION (m)	STRATIGRAPHIE	DESCRIPTION		CONC. VAPEUR (ppm OU % LIE)	M ODEUR	NSNEL S D P	TYPE	% RÉCUPÉRATION	N (Coups/6")	NUMÉRO	ANALYSES	DUPLICATA	DIAGRAMME	DESCRIPTION	REMARQUES
		Surface du terrain.													
90.77		Remblai : Sable graveleux avec trace d matière organique. Brun sec.	е				TR			TE-04 (0.00-1.00)					0.5
-															
89.77		Remblai : Silt argileux avec trace de matière organique. Brun noir humide.								TE-04 (1.00-2.30)	HP F1-F4 HAP Métaux (R153)				1.0 -
1.5 -															1.5 ·
2.0 — 2.30 88.47		Octobrob Otto con an allowith													2.0 -
2.5 -		Sol naturel : Silt avec un peu d'argile gr humide.	IS							TE-04 (2.30-3.20)					2.5 ·
3.0 — 3.20 87.57		Timitation d ead													3.0 -
3.5 —		Fin de la tranchée													3.5 -
4.0															4.0



RAPPORT DE TRANCHÉE: TE-05

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Vérifié par : Annie Gauthier

Préparé par : Catherine Tardy Laporte Date début : 2013-07-02 Vérifié par : Annie Gauthier Date fin : 2013-07-02

Nom du projet : Évaluation Environnementale de site (ÉES) Phase II

Site: Site # 38 Orléans

Secteur: 3636-3646, chemin Innes, Orléans (Ontario)

Client : La Coop fédérée

Numéro de projet : 131-13558-00

Coordonnées géographiques : X = 75.5204743629 °O Y = 45.4472004843 °N

Élévation surface : 92.43 m ()

Élévation margelle :

Entrepreneur forage : Denis Ladouceur Excavation Ltée ODEUR

Type de foreuse : Rétrocaveuse Équipement de forage : Manuelle /

Diamètre du forage : Fluide forage :

Projet:131-13558-00_TE_01.GPJ Type rapport: GENIVAR-PUITS-FR Data Template: GENIVAR_TEMPLATE_GEOTECH.GDT 2013-8-16

Équip. d'échantillonnage : Carottier fendu

e ODEUR F - Faible odeur M - Odeur moyenne P - Odeur persistante

> VISUEL D - Produit disséminé S - Sol saturé de produit

TYPE D'ÉCHANTILLON
CD - Carottier à diamants
CF - Cuillère fendue
PS - Échantillonneur à piston
TC - Tube creux
TM - Tarière manuelle
TR - Truelle
TS - Tube Shelby

TT - Tube transparent

ANALYSES CHIMIQUES HAC
BPC Biphényles polychlorés
BTEX Benzène, toluène, éthylbenzène,
sylène
COT Carbone organique total HP C₁₀-C₅₀
(Cyanure, fluorure, bromure, soufre
total)

C. Dickit

C. Inorg. Autres composés inorganiques (cyanure, fluorure, bromure, soufre la HP F1.4 Mercure total)

C. Phénol. Composés phénoliques
COV Hydrocarbures HAM et HAC
Diox. & Fur. Dioxines et furanes

Hydrocarb. aliphatiques chlorés Hydrocarbures aromatiques monocycliques Hydrocarbures aromatiques polyocitiques Hydrocarbures pétroliers C₁₀-C₅₀ Hydrocarb. pétrol. F1-F4 (C₁₀-C₅₀)

Argent, arsenic, baryum, cadmium, cobalt, chrome, cuivre, étain, manganèse, molybdène, nickel, plomb, selénium, zinc.

PRINCE CONCINE STRANGORAPHE QUESTION PRINCE CONTINUENS PRINCE CONTINUENCE CONTINUENC	Equip. a ed	chantillor	nnage : Carottier fendu	¥ Ni	veau d'e			hase lil	bre	<u> </u>	Diox. & Fur.	Hydrocarbures F Dioxines et furan	ies	RM	ID Lixiviation (magnetic magnetic ma	molybdène, nickel, um, zinc. at. dangereuses)
Surface du terrain.	ÉLÉVATION	STRATIGRAPHIE				ODFUR	VISUEL	ÉCHANTILLON	% RECUPERATION			ANALYSES	DUPLICATA			REMARQUES
- 0.15. terre vegetate et un peu de matere Te. 05			Surface du terrain.						_							
trace de matière résiduelle (bois) brun. 1.5 - 2.30 2.0 - 2.30 90.13 Remblai : Silt argileux avec trace de matière organique brun noir. TE-05 (2.30-3.00) TE-06 (3.00-3.60)	0.15		résiduelle (20%) (brique). Remblai : Silt sableux graveleux avec				T	R			TE-05 (0.15-2.30)	HP F1-F4 HAP				
2.0 — 2.30 — 2.30 — 2.5 — 3.60	- 0.5 — - -		trace de matière résiduelle (bois) brun.													0.4
2.30 90.13 Remblai : Silt argileux avec trace de matière organique brun noir. TE-05 (2.30-3.00) TE-05 (3.00-3.60)	.0 —															1.
2.30 90.13 Remblai : Silt argileux avec trace de matière organique brun noir. TE-05 (2.30-3.00) TE-05 (3.00-3.60)	5 —															1.
TE-05 (3.00-3.60)	-															2.
TE-05 (3.00-3.60)	-															2.
3.60	- - -										TE-05 (3.00-3.60)					3.
	3.60		Fin de la tranchée													3.



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 1/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates: 161-06382-00

X = 5032601 mEY = 459357 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Drilling Equipment: Drilling Method:

Strata Drilling Group Geomachine GS100

Probe rod 50 mm

ODOUR F - Light M - Medium P - Persistent VISUAL

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube TU - DT32 Liner

SAMPLE TYPE

PCB BTEX Inorg. C.

CHEMICAL ANALYSIS

Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH

MAH Monocyclic Aromatic Hydrocarbons
PAH C₁₀-C₂₀ Petroleum Hydrocarbons C₁₀-C₂₀
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C₁₁-C₂₀)
Metals Arsenic, Barium, Cadmium, Chromium,
Cobalt, Copper, Lead, Manganese,
Mobdenum, Nickel, Silver, Tin, Zinc.

	Ť	lethod:		<u> -</u>	Water Le		TION	$\overline{}$	ee Phas		CAMPI FO			MONIT	TODING WELL	
DEDTU			GEOLOGY / LITHOLOGY		OBSE	RVA	, ION	5	<u></u>		SAMPLES				FORING WELL	
<u>DEPTH</u> ELEVATIO (m))N	LITHOLOGY	DESCRIPTION		VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	#NOGO	IP D	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
			Ground surface.													
0.3	30		FILL sand and gravel, brown, dry		H - 0, I - 0			MC	66		BH16-1 1A					
.5 —			CLAYEY SILT brown, moist, stiff		H - 0, I - 0						BH16-1 1B	Metals and Inorganics				
.5 — 1.5	52	<u> </u>	SILTY CLAY grey-brown, moist, stiff		H - 0, I - 0			MC	100		BH16-1 2A	Metals and Inorganics		-		
.0 —	2															:
_	o.		GRAVEL with sand and some silty cla grey-brown, wet, soft	у,	H - 0, I - 0						BH16-1 2B	Metals and Inorganics		-		:
.0 -	39 .	<u>.O.</u>	Refusal at 2.89 m below ground surfaction assumed bedrock End of borehole at 2.89 m.	e										-		;
.5 —																;
- 0.																
.5 —																
-																



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 1/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

161-06382-00 X = 5032622 mE

Y = 459337 mN

Surface Elevation: m () Top of PVC Elevation:

SAMPLE TYPE Drilling Company: Strata Drilling Group

Drilling Equipment: Geomachine GS100 Probe rod Drilling Method:

Borehole Diameter: 50 mm Drilling Fluid: None

ODOUR F - Light M - Medium P - Persistent

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube VISUAL D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

MAH Monocyclic Aromatic Hydrocarbons
PAH Polycyclic Aromatic Hydrocarbons
PH C₁₀-C₅₀ Petroleum Hydrocarbons C₁₀-C₅₀
Metals Arsenic, Barium, Cadmium, Chromium,
Coball, Copper, Lead, Manganese,
Molybdenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

GEOLOGY / LITHOLOGY DESCRIPTION Ground surface. FILL sand and gravel, brown, dry CLAYEY SILT brown, moist, stiff		OBSE (Pund) NAPOR CONC. H - 0, 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0	ODOUR PM	SNOI S NISUAL	SAMPLE TYPE	% RECOVERY	N (Blow/6")	BH16-2	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
Ground surface. FILL sand and gravel, brown, dry		H - 0, I - 0 H - 20,	F M I	O VISUAL	1 1		N (Blow/6")	BH16-2 1A	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
FILL sand and gravel, brown, dry		H - 0, I - 0 H - 20,	FMI	PDS		50		1A					
FILL sand and gravel, brown, dry		H - 0, I - 0 H - 20,				50		1A					
		I - 0 H - 20,			MC	50	•	1A					
CLAYEY SILT brown, moist, stiff											ļ.		
								BH16-2 1B	Metals and Inorganics				
		H - 0, I - 0			MC	83		BH16-2 2A	Metals and Inorganics		-		
with some sand Refusal at 2.44 m below ground surfaction assumed bedrock End of borehole at 2.44 m.	ce	H - 0, I - 0						BH16-2 2B	Metals and Inorganics		- -		:
													:
													:



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 2/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

Surface Elevation:

161-06382-00 X = 5011286 mE

Y = 472354 mN 87.23 m (Relative) Top of PVC Elevation:

Drilling Company: Strata Drilling Group

Drilling Equipment: Geomachine GS100 Probe rod Drilling Method:

ODOUR F - Light M - Medium P - Persistent VISUAL

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube

SAMPLE TYPE

CHEMICAL ANALYSIS

PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene,
Xylene
Inorg. C. Inorganic Compounds
Phenol. C. Phenolic Compounds

 $\begin{array}{lll} \mbox{MAH} & \mbox{Monocyclic Aromatic Hydrocarbons} \\ \mbox{PAH} & \mbox{Polycyclic Aromatic Hydrocarbons} \\ \mbox{PH C}_{10^{-}C_{50}} & \mbox{Petroleum Hydrocarbons} & \mbox{C}_{10^{-}C_{50}} \\ \mbox{HF 1-F4} & \mbox{Petroleum Hydrocarbons} & \mbox{F1-H2} \\ \mbox{Metals} & \mbox{Arsenic, Barium, Cadmium, Chronium,} \\ \end{array}$

Dril	ling Flu		: 50 mm Air	D - Disser S - Satura	minated P Ited with F	roduct	, S	U - DT3	by Tube 2 Liner cro Core	Liner	VOC Vola & C/ Diox. & Fur. Diox	ins & Furans		HWR	Arsenic, Barium, Ca Cobalt, Copper, Le Molybdenum, Nicke Leacheate Tests (H	ad, Manganese, el, Silver, Tin, Zinc.
Sar	mpling	Method:	0501 00V (151101 00V	Δ	Water L			▼ Fre	e Phase	Э		orinated Aliphatic H	-lydrocarl		TORINO WELL	
ELEV	<u>PTH</u> 'ATION m)	ГТНОГОСУ	GEOLOGY / LITHOLOGY DESCRIPTION		VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)			ß.	% RECOVERY	N (Blow/6")	SAMPLES WOMER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
			Ground surface.			\dagger										
-	87.23 0.43		FILL sand and gravel, brown, dry		H - 0, I - 0	,		МС	73		BH/MW16-3 1A	3				
0.5 —	86.80		CLAYEY SILT brown, moist, stiff		H - 0, I - 0	,					BH/MW16-3	Metals and Inorganics			≪ − Bentonite	1
1.5 — - - - - 2.0 —	1.52 85.71		SILTY CLAY grey-brown, moist, stiff		H - 0, I - 0	,		MC	100		BH/MW16-3 2A	3 Metals and Inorganics			Slotted PVC pipe	2
- 2.5 - -					H - 0, I - 0	,					BH/MW16-3 2B	3			sand	2
5.0	3.05 3.12														SCREEN	3
- - -	3.12 84.11		GRAVEL with sand , brown, wet BEDROCK		H - 0	.]		MC	5		BH/MW16-3	Metals and Inorganics			Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m WATER Depth: 2.13 m	
3.5 - - - -															Elev.: m Date: 6/7/2016	3
4.0 - - - -																4
1.5 - - -	4.57 82.66		End of borehole at 4.57 m.		-											4
-																



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 1/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Projet: 161-08368-00 PHASE TWO ESA - 3636 INNES ROAD.GPJ Type rapport: WSP_EN_WELL-ENVIRONMENTAL Data Template: WSP_TEMPLATE_GEOTECH.GDT 6/10/2016

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

161-06382-00 X = 5032619 mE

Y = 459397 mN

Surface Elevation: Top of PVC Elevation:

Drilling Company: Drilling Equipment: Drilling Method:

Borehole Diameter:

Strata Drilling Group Geomachine GS100

Probe rod 50 mm None

ODOUR F - Light M - Medium P - Persistent VISUAL

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

MAH PAH PH C₁₀-C₅₀ PH F1-F4 Metals

m ()

Monocyclic Aromatic Hydrocarbons Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀ Petroleum Hydrocarbons T-1F-4 (C₁₀-C₅₀) Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Choinated Albertail D - Disseminated Product S - Saturated with Product Drilling Fluid: Sampling Method: Chlorinated Aliphatic Hydrocarbons ▼ Free Phase

				GEOLOGY / LITHOLOGY	c	DBSE	RVA	ATIC	NS				SAMPLES			MONIT	FORING WELL	
EL	DEPT LEVA (m)	TION	гиногосу	DESCRIPTION Ground surface.		VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	F	M P	NSUAL S	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
2				Ground surface.														
	-	0.43		FILL sand and gravel, brown, dry	Н	I - 0, I - 0	1 1			МС	71		BH16-4 1A					- - -
0.5				CLAYEY SILT brown, moist, stiff		I - 0, I - 0							BH16-4 1B	Metals and Inorganics PHCs F2-F4				0.5 - - -
1.0	- - - - -																	1.0
1.5	5 - - - - -					I - 0, I - 0	-			MC	86		BH16-4 2A			-		1.5 — - - -
2.0	-	2.28					-							Matalagard	BH16-	-		2.0 - -
2.5	- 5 - - -			SILTY CLAY grey-brown, moist, stiff -becoming wet and soft		I - 0, I - 0							BH16-4 2B	Metals and Inorganics	4- 102B			2.5 - - - -
3.0)-	3.05		Refusal at 3.05 m below ground surface on assumed bedrock End of borehole at 3.05 m.	/		-									-		3.0
3.5	- 5 - - -																	- 3.5 - - -
4.0) - - - - -																	- 4.0 - -
4.5	5 -																	- 4.5 — - - -
<u></u>	, 1																	5.0



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 2/6/2016

Project Name: Phase Two Environmental Site Assessment

Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario Site:

Sector:

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

161-06382-00 X = 5032607 mE

Y = 459421 mN 87.47 m (Relative)

Surface Elevation: Top of PVC Elevation:

Drilling Company: Strata Drilling Group **Drilling Equipment:** Geomachine GS100

Drilling Method: Probe rod 50 mm Borehole Diameter: Drilling Fluid: Air

ODOUR F - Light M - Medium P - Persistent VISUAL

D - Disseminated Product S - Saturated with Product

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene PCB BTEX Inorganic Compounds Inorg. C Phenol. C. VOC

PAH PH Cso-Cso PH F1-F4 Phenolic Compounds Volatil Organic Compounds (MAH & CAH) Metals HWR

Monocyclic Aromatic Hydrocarbons Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀
Petroleum Hydrocarbons C₁₀-C₅₀
Petroleum Hydrocarbons F1-F4 (C₁₀-C₅₀)
Arsenic, Barium, Cadmium, Chromium,
Cobalt, Copper, Lead, Manganese,
Molybdenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

Dioxins & Furans CAH Sampling Method: Chlorinated Aliphatic Hydrocarbons ▼ Free Phase OBSERVATIONS GEOLOGY / LITHOLOGY SAMPLES MONITORING WELL **DEPTH** VISUAL DUPLICATE LITHOLOGY ODOUR % RECOVER' SAMPLE N (Blow/6") ANALYSIS DIAGRAM DESCRIPTION DESCRIPTION REMARKS NUMBER **ELEVATION** (m) FMPDS Projet:161-08368-00 PHASE TWO ESA - 3636 INNES ROAD.GPJ Type rapport: WSP_EN_WELL-ENVIRONMENTAL Data Template: WSP_TEMPLATE_GEOTECH.GDT 6/10/2016 Ground surface 87.47 FILL sand and gravel, brown, dry H - 0, MC 76 BH/MW16-5 0.23 I - 0 1A 87.24 BH16-BH/MW16-5 Metals and CLAYEY SILT brown, moist, stiff H - 0, 5-101B Inorganics PHCs F2-F4 I - 0 1B 0.5 0.5 1.0 1.5 85.95 SILTY CLAY grey-brown, moist, stiff H - 0, MC 83 BH/MW16-5 I - 30 2A 2.0 2.0 Slotted PVC pipe ∇ 2.5 2.5 becoming wet and soft H - 0 3H/MW16-5 SCREEN 3.0 3.0 Inorganics PH F₁-F₄ BTEX 84.42 I - 35 2B Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m **BEDROCK** WATER Depth: 2.27 m Elev.: m Date: 6/7/2016 3.5 3.5 4.0 4.5 4.57 82.90 End of borehole at 4.57 m.



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 1/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

161-06382-00

X = 5032622 mEY = 459430 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Drilling Equipment: Drilling Method:

Borehole Diameter:

Strata Drilling Group Geomachine GS100

Probe rod 50 mm None

ODOUR F - Light M - Medium P - Persistent VISUAL

D - Disseminated Product S - Saturated with Product

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

CHEMICAL ANALYSIS

Inorg. C. Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)

* Ever Ninxins & Furans

MAH Monocyclic Aromatic Hydrocarbons
PAH C10-C50 Petroleum Hydrocarbons C10-C50
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C10-C50)
Metals Arsenic, Barium, Cadmium, Chromium, Chobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Siwer, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

		GEOLOGY / LITHOLOGY		OBSER	RVAT	IONS				SAMPLES			MONI	TORING WELL	
<u>DEPTH</u> ELEVATION (m)	ГТНОГОСУ	DESCRIPTION		VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	DDOUR	NISUAL S	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
		Ground surface.													
-		FILL Sand and gravel, brown, dry		Н -			МС	46		BH16-6					
- <u>0.23</u> -		CLAYEY SILT brown, moist, stiff		15, I - 2						1A BH16-6	Metals and		-		
.5 —		CENTER GIEF Stermi, mood, sum		H - 0, I - 0						1B	Inorganics PHF ₁ -F ₄ BTEX				
- - - - 5 — - -				H - 0, I - 0			MC	100		BH16-6 2A			-		
0 —															
-															
2.90													-		
3.05		SILTY CLAY grey-brown, moist, stiff Refusal at 3.05 m below ground surfaction assumed bedrock End of borehole at 3.05 m.	ce	H - 0, I - 0						BH16-6 2B	Metals and Inorganics		-		
5 -		2.1d 6.1 25.161.010 d. 6.30 m.													
0 -															
5 —															
-															



Page 1 of 1

Prepared by: **Kathryn Maton** Reviewed by: **Carolyn Adams**

Date (Start): 1/6/2016 Date (End): 1/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc.

Project Number: Geographic Coordinates: **161-06382-00** X = 5032572 mE

Y = 459424 mN m ()

Surface Elevation: Top of PVC Elevation:

Drilling Company:
Drilling Equipment:
Drilling Method:

Borehole Diameter:

Drilling Fluid:

Strata Drilling Group Geomachine GS100

Probe rod 50 mm None ODOUR F - Light M - Medium P - Persistent VISUAL

D - Disseminated Product S - Saturated with Product DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube TU - DT32 Liner MC - Macro Core Liner

SAMPLE TYPE

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Berzene, Toluene, Ethylbenzene,
Xylene
Inorg. C. Phenolic Compounds
Phenol. C. Phenolic Compounds

Inorg. C. Inorganic Compounds phenol. C. Phenolic Compounds M. VOC Votatil Organic Compounds (MAH & CAH)

Diox. & Fur. Dioxins & Furans HV

CAH Chlorinated Aliabitatic Hydrocarbons

MAH Monocyclic Aromatic Hydrocarbons PAH PC,10⁻C₅₀ Petroleum Hydrocarbons C₁₀-C₅₀ Ph F1-F4 Petroleum Hydrocarbons C₁₀-C₅₀ Petroleum Hydrocarbons F1-F4 (C₁₀-C₅₀) Metals Arsenic, Barium, Cadmium, Chromium, Obalt, Copper, Lead, Manganese, Molybdenum, Nickel, Siwer, Tin, Zinc.

	GEOLOGY / LITHOLOGY			RVAT	IONS	▼ Fre		SAMPLES					MONITORING WELL		
<u>DEPTH</u> ELEVATION (m)	ПТНОГОСУ	DESCRIPTION	VAPOR CONC. 1- Isobutylene (ppm)	M ODOUR	VISUAL	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS	
		Ground surface.													
0.20	1/ 1/ 1/ 1	TOP SOIL				MC	85								
- - 0.5 — - -		CLAYEY SILT brown or grey-brown, moist, stiff	H - 10, I 0	_					BH16-7 1	Metals and Inorganics PAH PH F,-F ₄ BTEX				(
.0 -															
.5 —			H - 0	,		MC	100		BH16-7 2A			-		:	
- - <u>2.44</u> .5 - - -		SILTY CLAY with some sand, grey-brown, moist, stiff becoming wet and soft	H - 0	,					BH16-7 2B	Metals and Inorganics		-		:	
.0 — 3.05		SANDY GRAVEL with some silty clay grey-brown, wet, soft	H - 0			MC	26		BH16-7 3			-		:	
.5 —														;	
4.11		Refusal at 4.11 m below ground surface on assumed bedrock End of borehole at 4.11 m.		_								-		2	
4.5 — — — —		End of porchoic dt 4.11 III.												,	
.0															



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 1/6/2016 Date (End): 2/6/2016

Project Name: Phase Two Environmental Site Assessment

Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario Site:

Sector:

Client: The Builders Warehouse Inc.

Project Number: Geographic Coordinates:

161-06382-00 X = 5032569 mEY = 459449 mN

86.84 m (Relative)

Surface Elevation: Top of PVC Elevation:

Drilling Company: Drilling Equipment:

Strata Drilling Group Geomachine GS100 Probe rod

F - Light M - Medium P - Persistent

ODOUR

DC - Diamond Corer SS - Split Spoon MA - Manual Auger

SAMPLE TYPE

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene PCB BTEX Inorganic Compounds Inorg. C

PH Cso-Cso PH F1-F4 Metals HWR

PAH

Monocyclic Aromatic Hydrocarbons Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀
Petroleum Hydrocarbons F1-F4 (C₁₀-C₅₀)
Arsenic, Barium, Cadmium, Chromium,
Cobalt, Copper, Lead, Manganese,
Molybdenum, Nickel, Silver, Tin, Zinc.

Drilling Method: VISUAL TR - Trowel Phenolic Compounds Volatil Organic Compounds (MAH & CAH) Phenol. C. VOC Borehole Diameter: 50 mm ST - Shelby Tube D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line Drilling Fluid: Air Leacheate Tests (Haz. Waste Reg.) Dioxins & Furans CAH Sampling Method: Chlorinated Aliphatic Hydrocarbons ▼ Free Phase OBSERVATIONS GEOLOGY / LITHOLOGY SAMPLES MONITORING WELL **DEPTH** ODOUR VISUAL % RECOVER DUPLICATE LITHOLOGY SAMPLE N (Blow/6") ANALYSIS DIAGRAM DESCRIPTION DESCRIPTION REMARKS NUMBER **ELEVATION** (m) FMPDS Projet: 161-08368-00 PHASE TWO ESA - 3636 INNES ROAD.GPJ Type rapport: WSP_EN_WELL-ENVIRONMENTAL Data Template: WSP_TEMPLATE_GEOTECH.GDT 6/10/2016 Ground surface 86.84 **TOP SOIL** MC 100 0.20 86.64 CLAYEY SILT brown or grey-brown, Metals and Н -BH/MW16-8 Inorganics PAH moist, stiff 10, 1 PH F₁-F₄ BTEX 0.5 - 0 0.5 1.0 ⊻ 1.5 MC 100 BH/MW16-8 10 I 2A 0 2.0 2.0 Slotted PVC pipe 2.44 84.40 2.5 2.5 SILTY CLAY grey-brown, moist, stiff Metals and H - 5 BH/MW16-8 SCREEN I - 0 2B Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m WATER Depth: 1.45 m Elev.: m Date: 6/7/2016 3.0 3.0 83.79 SANDY GRAVEL with trace to some silty MC 100 BH/MW16-8 H - 0I - 0 clay grey-brown, wet, soft ЗА 3.5 3.5 Н BH/MW16-8 15, 3В - 0 4.0 End of borehole at 4.11 m. 4.5 4.5



Page 1 of 1

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams Date (Start): 2/6/2016 Date (End): 2/6/2016

Project Name: Phase Two Environmental Site Assessment

Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario Site:

Sector:

Client: The Builders Warehouse Inc.

Project Number: Geographic Coordinates:

161-06382-00

X = 5032512 mE Y = 459382 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Drilling Equipment: Drilling Method:

Borehole Diameter:

Sampling Method:

Drilling Fluid:

6/10/2016

Data Template: WSP_TEMPLATE_GEOTECH.GDT

Strata Drilling Group Geomachine GS100 Probe rod

50 mm None

ODOUR F - Light M - Medium P - Persistent

DC - Diamond Corer SS - Split Spoon MA - Manual Auger VISUAL TR - Trowel ST - Shelby Tube D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

▼ Free Phase

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene PCB BTEX Inorganic Compounds Inorg. C

CAH

Phenolic Compounds Volatil Organic Compounds (MAH & CAH) Phenol. C. VOC HWR Dioxins & Furans Chlorinated Aliphatic Hydrocarbons

Monocyclic Aromatic Hydrocarbons Polycyclic Aromatic Hydrocarbons PAH Petroleum Hydrocarbons C10-C61 PH C₁₀-C₆ Petroleum Hydrocarbons C₁₀-C₅₀
Petroleum Hydrocarbons F1-F4 (C₁₀-C₅₀)
Arsenic, Barium, Cadmium, Chronium,
Cobalt, Copper, Lead, Manganese,
Molybdenum, Nickel, Silver, Tin, Zinc. PH F1-F4 Metals Leacheate Tests (Haz. Waste Reg.)

OBSERVATIONS GEOLOGY / LITHOLOGY SAMPLES MONITORING WELL VAPOR CONC. - Isobutylene (ppm H - Hexane (ppm) **DEPTH** VISUAL % RECOVER DUPLICATE LITHOLOGY ODOUR SAMPLE N (Blow/6") ANALYSIS DIAGRAM DESCRIPTION DESCRIPTION REMARKS NUMBER **ELEVATION** (m) FMPDS Ground surface 0.17 **TOP SOIL** MC H - 0 BH16-9 Metals and 0.5 0.5 CLAYEY SILT brown or grey-brown, I - 0 1 moist, stiff 1.0 1.0 1.5 SILTY CLAY grey-brown, moist, stiff H - 0 MC 100 BH16-9 I - 0 2A 2.0 2.0 2.5 2.5 becoming wet BH16-9 Metals and H - 0 3.0 Inorganics 3.0 I - 0 MC 100 H - 0, BH16-9 Projet:161-08368-00 PHASE TWO ESA - 3636 INNES ROAD.GPJ Type rapport:WSP_EN_WELL-ENVIRONMENTAL 1 - 0 3A 3.5 3.5 4.0 4.0 -with some sand and some gravel -becoming grey H - 0BH16-9 I - 0 3B 4.5 4.5 Metals and Inorganics SANDY GRAVEL with some silty clay H - 0. MC 53 BH16-9 grey-brown, wet 1-0 5.0 5.0 5.5 5.5 6.0 6.0 H - 0 MC 60 BH16-9 6.5 I - 0 5 6.5 7.01 7.0 Refusal at 7.01 m below ground surface 7.0 on assumed bedrock 7.5 7.5 End of borehole at 7.01 m. 8.0 -8.0 8.5 -8.5 9.0 9.0 9.5 9.5



Page 1 of 1

Date (Start): 2/6/2016

Date (End): 2/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Projet: 161-08368-00 PHASE TWO ESA - 3636 INNES ROAD.GPJ Type rapport: WSP_EN_WELL-ENVIRONMENTAL Data Template: WSP_TEMPLATE_GEOTECH.GDT 6/10/2016

Client: The Builders Warehouse Inc. Reviewed by: Carolyn Adams Project Number: Geographic Coordinates:

Prepared by: Kathryn Maton

161-06382-00

X = 5032473 mEY = 459402 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Strata Drilling Group Drilling Equipment: Geomachine GS100 Probe rod

Drilling Method: Borehole Diameter: 50 mm Drilling Fluid: None Sampling Method:

ODOUR F - Light M - Medium P - Persistent VISUAL

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

Phenol. C. Phenolic Compounds
VCC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated & Instance Chlorinated Aliphatic Hydrocarbons

MAH Monocyclic Aromatic Hydrocarbons
PAH Polycyclic Aromatic Hydrocarbons
PH C₁₀-C₅₀ Petroleum Hydrocarbons C₁₀-C₅₀
Metals Arsenic, Barium, Cadmium, Chromium,
Coball, Copper, Lead, Manganese,
Molybdenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

Sai	npling	Method:		ΔΛ	☑ Water Level 및		▼ Fre	ee Phase		CAH Chlo	orinated Aliphatic F	Hydrocar	bons		idz. Wasie Reg.)	
			GEOLOGY / LITHOLOGY		OBSER			1			SAMPLES			MONI	FORING WELL	
ELEV	PTH ATION m)	ІТНОГОСУ	DESCRIPTION		VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR	NISUAL S	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
			Ground surface.													
-	0.23		TOP SOIL	/				МС	80					-		
0.5 -			CLAYEY SILT brown or grey-brown, moist, stiff		H - 0, I - 0						BH16-10 1	Metals and Inorganics				0.5
1.5 -					H - 0,			MC	100		BH16-10 2A			-		1.5
2.5	2.61										ZA					2.
3.0 -			SILTY CLAY grey-brown, wet, soft		H - 0, H - 0,			MC	100		BH16-10 2B BH16-10	Metals and Inorganics		-		3.0
.5 -					I - 0,			IVIC	100		3A			-		3.
.0 —					H - 0, I - 0						BH16-10 3B					4.
.0.					H - 0, I - 0			МС	100		BH16-10 4A	Metals and Inorganics				5.
.5 -																5.
.0 —	6.10		SANDY GRAVEL with some silty clay ¶ grey-brown, wet, soft		H - 0,						BH16-10 4B			-		6.
.0 -			Refusal at 6.40 m below ground surface on assumed bedrock													7.
.5 -			End of borehole at 6.40 m.													7.
.0 -																8.
5 -																9.
5																9



Page 1 of 1

Date (Start): 2/6/2016

Date (End): 2/6/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Reviewed by: Carolyn Adams Project Number:

Prepared by: Kathryn Maton

161-06382-00

Geographic Coordinates: X = 5032342 mEY = 459432 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Drilling Equipment: Drilling Method:

Borehole Diameter:

Drilling Fluid:

Strata Drilling Group Geomachine GS100

Probe rod 50 mm None

ODOUR F - Light M - Medium P - Persistent

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube VISUAL D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

Inorg. C. Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans

MAH Monocyclic Aromatic Hydrocarbons
PAH Olycyclic Aromatic Hydrocarbons
PH C₁₀-C₅₀ Petroleum Hydrocarbons C₁₀-C₅₀
Metals Arsenic, Barium, Cadmium, Chromium,
Coball, Copper, Lead, Manganese,
Molydoenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

Ground surface. TOP SOIL CLAYEY SILT brown or grey-brown, moist, stiff		VAPOR CONC. I- Isobutylene (ppm) H - Hexane (ppm)	F M ODOUR	NISUAL	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
TOP SOIL CLAYEY SILT brown or grey-brown,				\neg	ગ				<	na	ā		
CLAYEY SILT brown or grey-brown,													
					МС	86					-		
		H - 0, I - 0						BH16-11 1					
SILTY CLAY grey-brown, wet to very w	wot	H - 0,			MC	100		BH16-11	Metals and		-		
soft to very soft	vei,	I - 0,			IVIC	100		2A	Metals and Inorganics				:
-becoming wet											-		:
		l - 0						2B			-		
		H - 0, I - 0			MC	100		BH16-11 3A					
hannanian away and way attacks and													
- becoming grey and unweathered		H - 0,						BH16-11 3B	Metals and Inorganics		-		
		H - 0, I - 0			MC	100		BH16-11 4A					
								BH16-11			-		
Refusal at 6.10 m below ground surface	e r							15			-		
on assumed bedrock End of borehole at 6.10 m.													
	→ becoming wet → becoming grey and unweathered → Refusal at 6.10 m below ground surfaction assumed bedrock	→ becoming wet → becoming grey and unweathered → Refusal at 6.10 m below ground surface on assumed bedrock	- becoming wet H - 0, I - 0	- becoming wet H - 0, 1-0 H - 0, 1-0	- becoming wet H - 0, 1-0	- becoming wet H - 0, 1-0 H - 0,	becoming wet H - 0, I - 0 H - 0, I - 0 MC 100 becoming grey and unweathered H - 0, I - 0 H - 0, I - 0	- becoming wet H - 0,	#- becoming wet H - 0, -0 H - 0, H - 0, -0 H - 0, -	*- becoming wet H - 0,	# becoming wet H - 0, H - 0, I - 0 MC 100 BH16-11 3A + becoming grey and unweathered H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 H - 0, I - 0 Refusal at 6.10 m below ground surface on assumed bedrock	# becoming wet H - 0,	# becoming wet H - 0, H -



Page 1 of 1

Date (Start): 2/6/2016

Date (End): 2/6/2016

Reviewed by: Carolyn Adams Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Projet: 161-08368-00 PHASE TWO ESA - 3636 INNES ROAD.GPJ Type rapport: WSP_EN_WELL-ENVIRONMENTAL Data Template: WSP_TEMPLATE_GEOTECH.GDT 6/10/2016

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

Prepared by: Kathryn Maton

161-06382-00

X = 5032334 mEY = 459386 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Strata Drilling Group Drilling Equipment: Geomachine GS100

Probe rod Drilling Method: Borehole Diameter: 50 mm Drilling Fluid: None Sampling Method:

ODOUR F - Light M - Medium P - Persistent

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube VISUAL D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line

SAMPLE TYPE

CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

Phenol. C. Phenolic Compounds
VCC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated & Instance Chlorinated Aliphatic Hydrocarbons

MAH Monocyclic Aromatic Hydrocarbons
PAH Polycyclic Aromatic Hydrocarbons
PH C₁₀-C₅₀ Petroleum Hydrocarbons C₁₀-C₅₀
Metals Arsenic, Barium, Cadmium, Chromium,
Coball, Copper, Lead, Manganese,
Molybdenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

Samp	oling N	Method:		▼ Water Level ▼ Free Phase CAH				DIDX. & FUI. DIDXIRS & FUIRINS CAH Chlorinated Aliphatic Hydrocarbons								
			GEOLOGY / LITHOLOGY		OBSER			1			SAMPLES			MONIT	FORING WELL	
<u>DEPT</u> ELEVAT (m)	TION	ГІТНОГОСУ	DESCRIPTION		VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	P ODOUR	P D S	SAMPLE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
			Ground surface.													
0.5 -			TOP SOIL CLAYEY SILT brown or grey-brown, moist, stiff		H - 0, I - 0			МС	76		BH16-12 1			_		0.8
2.0	1.52		SILTY CLAY grey-brown, moist, stiff becoming wet and soft		H - 0, I - 0			МС	100		BH16-12 2A	Metals and Inorganics		-		1.5 2.0
2.5 -			→ becoming grey, very soft and unweathe.	red	H - 0, I - 0						BH16-12 2B			-		2.5 3.0
3.5 —			33 3, 1, 1111		H - 0, I - 0			МС	100		BH16-12 3A			-		3.
H.5 —					H - 0, I - 0 H - 0,			МС	100		BH16-12 3B BH16-12	Metals and Inorganics		-		4.
.0 -					I - 0				100		4A					5. 5.
.0 -	6.25		←with some sand Refusal at 6.25 m below ground surface	· [H - 0, I - 0						BH16-12 4B			-		6. 6.
.0 -			on assumed bedrock End of borehole at 6.25 m.		1 0						45					7.
5.0																7. 8.
.5 -																8. 9.
.5 —																9.



Page 1 of 1

Date (Start): 2/6/2016

Date (End): 2/6/2016

Reviewed by: Carolyn Adams

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Project Name: Phase Two Environmental Site Assessment

Sector:

Client: The Builders Warehouse Inc. Project Number: Geographic Coordinates:

Prepared by: Kathryn Maton

161-06382-00

X = 5032385 mEY = 459515 mN

Surface Elevation: m () Top of PVC Elevation:

Drilling Company: Strata Drilling Group Drilling Equipment: Geomachine GS100 Drilling Method: Probe rod

Borehole Diameter: 50 mm Drilling Fluid: None

ODOUR SAMPLE TYPE F - Light M - Medium P - Persistent

DC - Diamond Corer SS - Split Spoon MA - Manual Auger TR - Trowel ST - Shelby Tube VISUAL D - Disseminated Product S - Saturated with Product TU - DT32 Liner MC - Macro Core Line CHEMICAL ANALYSIS Poly-Chlorinated Biphenyls Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds PCB BTEX

Inorg. C. Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans

MAH Monocyclic Aromatic Hydrocarbons
PAH Olycyclic Aromatic Hydrocarbons
PH C₁₀-C₅₀ Petroleum Hydrocarbons C₁₀-C₅₀
Metals Arsenic, Barium, Cadmium, Chromium,
Coball, Copper, Lead, Manganese,
Molydoenum, Nickel, Silver, Tin, Zinc. Leacheate Tests (Haz. Waste Reg.)

		GEOLOGY / LITHOLOGY		BSER					;	SAMPLES			MONI	TORING WELL	
<u>DEPTH</u> ELEVATION (m)	ГІТНОГОĞҮ	DESCRIPTION	SNOS GOAV	I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR	NISUAL S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
		Ground surface.													
0.18		√ TOP SOIL	/				мс	73					-		
.0 —		CLAYEY SILT brown or grey-brown, moist, stiff		- 0, - 0											
.5 = 1.52		SILTY CLAY grey-brown, moist, stiff		- 0,			MC	100				BH16-	-		
.0 -		SIETT SEAT groy brown, moist, still		- 0			IVIC	100			Metals and Inorganics	BH16- 13- 102A			:
.5 —		becoming wet											-		:
.0 -		becoming wet to very wet		- 0, - 0									-		:
5 -		← becoming grey and unweathered	H	- 0, - 0			MC	100					-		
0				- 0, - 0							Metals and Inorganics				
5 =			-										_		
0 = 5.18		₹-Refusal at 5.18 m below ground surface	1	- 0, - 0			MC	50					-		:
5 =		on assumed bedrock	/												
.0 -		End of borehole at 5.18 m.													
5 =															
0															
.5 —															
.0 =															
5 -															
0															
5 —															



TEST PIT RECORD: TP16-1

Page 1 of 1

Date (Start): 2/11/2016

Date (End): 2/11/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Project Number:

Geographic Coordinates:

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams

X = 5032612 mE

Y = 459421 mN

161-06382-00

Surface Elevation: m ()

CHEMICAL ANALYSIS Contractor: A.Lacroix Equipment Rentals Ltd. Monocyclic Aromatic Hydrocarbons Equipment: **Excavator** Poly-Chlorinated Biphenyls PAH PH C₁₀-C₅₀ Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀ BTEX Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds SAMPLE TYPE Inorg. C. Petroleum Hydrocarbons C₁₀-C₂₀)
Petroleum Hydrocarbons F1-F4 (C₁₀-C₂₀)
Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
Leacheate Tests (Haz. Waste Reg.) VAPOUR READINGS PH F₁-F₄ Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH) TM - Manual Auger TR - Trowel Metals I - Isobutylene H - Hexane Diox. & Fur. Dioxins & Furans
EC Electrical Conductivity HWR OBSERVATIONS GEOLOGY / LITHOGRAPHY SAMPLES

EEETH ELEVATION DESCRIPTION D	ı [GEOLOGY / LITHOGRAPHY	OBSER	RVATIO	ONS		SAMPL	.ES			
metal and organic material, brown, dry I - 0 SA1 SA	ELEVATION	LITHOGRAPHY	DESCRIPTION	VAPOR CONC. (ppm)		<u> </u>	S.	NUMBER	ANALYSIS	DUPLICATE	WATER ARRIVAL	REMARKS
metal and organic material, brown, dry I - 0 SA1 SA		*****										
1.0 — 1.01 — CLAYEY SILT brown, moist — H - 0, 1-0 — TR TP16-1 SA2 — 1.5			FILL Sand and gravel with some bricks, wood, metal and organic material, brown, dry	H - 0, I - 0			TR	TP16-1 SA1				0.5 —
End of test pit at 1.34 m. 1.5 — 1.	1.0 1.01		CLAYEY SILT brown, moist		-		TR	TP16-1 SA2				1.0 —
	1.5 —	220222222	End of test pit at 1.34 m.									1.5 —



TEST PIT RECORD: TP16-2

Page 1 of 1

Date (Start): 2/11/2016

Date (End): 2/11/2016

Project Name: Phase Two Environmental Site Assessment

A.Lacroix Equipment Rentals Ltd.

SAMPLE TYPE

TM - Manual Auger TR - Trowel

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Contractor:

Equipment:

I - Isobutylene

VAPOUR READINGS

Client: The Builders Warehouse Inc.

Excavator

Project Number:

Geographic Coordinates:

Prepared by: Kathryn Maton Reviewed by: Carolyn Adams

> 161-06382-00 X = 5032619 mE Y = 459408 mN

Surface Elevation: m ()

PAH PH C₁₀-C₅₀

PH F₁-F₄

Metals

CHEMICAL ANALYSIS

Poly-Chlorinated Biphenyls BTEX Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds Inorg. C.

Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)

Diox. & Fur. Dioxins & Furans

Monocyclic Aromatic Hydrocarbons Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀ Petroleum Hydrocarbons F1-F4 (C₁₀-C₅₀)
Arsenic, Barium, Cadmium, Chromium, Cobalt,
Copper, Lead, Manganese, Molybdenum,
Nickel, Silver, Tin, Zinc.

H - Hexane					& Fui		tins & Fur trical Cor	rans nductivity	HWR		, Silver, Tin, Žinc. eate Tests (Haz. Waste Reg.)			
		GEOLOGY / L	I ITHOGRAPHY	OBSER	VATIO	ONS		SAMPL	.ES					
<u>DEPTH</u> ELEVATION (m)	LITHOGRAPHY	DESCR	RIPTION	VAPOR CONC. (ppm)	NDOOUR F M F	O VISUAL	Ŋ	NUMBER	ANALYSIS	DUPLICATE	WATER ARRIVAL	REMARKS		
-		FILL Sand and g metal and organi	ravel with some bricks, wood, ic material, brown, dry											
_				H - 0, I - 0			TR	TP16-2 SA1						
0.76												0.		
0.99		CLAYEY SILT bro										1		
0.76		End of test pit at	: 0.99 m.											
; —												1.		
-														



TEST PIT RECORD: TP16-3

Page 1 of 1

Prepared by: **Kathryn Maton** Reviewed by: **Carolyn Adams**

Date (Start): 2/11/2016 Date (End): 2/11/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc.

Project Number:

Geographic Coordinates: X = 5032631 mE

Y = 459412 mN

161-06382-00

Surface Elevation: m ()

Contractor Equipment		uipment Rentals Ltd.		LYSIS y-Chlorinated Biphenyls Izene, Toluene, Ethylbenzene, Xylene	MAH PAH PH C ₁₀ -C ₅₀	Polycyclic	Aromatic	c Hydrocarbons Hydrocarbons rbons C ₁₀ -C ₅₀
VAPOUR READ I - Isobutylene H - Hexane	INGS	SAMPLE TYPE TM - Manual Auger TR - Trowel	Inorg. C. Inor Phenol. C. Phe	ganic Compounds enolic Compounds atil Organic Compounds (MAH & CAH)	PH C ₁₀ -C ₅₀ PH F ₁ -F ₄ Metals	Petroleum Arsenic, E	n Hydrocai Barium, Ca ead, Mang	rbons F1-F4 (C ₁₀ -C ₅₀) admium, Chromium, Cobalt, ganese, Molybdenum,
n - nexalle				ctrical Conductivity	HWR			az. Waste Reg.)
	GEOLOGY / L	ITHOGRAPHY	OBSERVATIONS	SAMPLES				

		GEOLOGY / LITHOGRAPHY	OBSEI	RVAT	IONS		SAMPL	ES			
DEPTH ELEVATION (m)	/ATION \(\overline{\over	DESCRIPTION	VAPOR CONC. (ppm)	F M ODOUR	NISNAL S	ŝ	NUMBER	ANALYSIS	DUPLICATE	WATER ARRIVAL	REMARKS
			-								
_		FILL Sand and gravel with some bricks, wood, metal and organic material, brown, moist to wet									
			H - 0 I - 0	,		TR	TP16-3 SA1				
0.5 —											0.5 -
- 0.9											
.0.9		CLAYEY SILT brown, wet	H - 0 I - 0	,		TR	TP16-3 SA2				1.0 –
1.5 — 1.5	2										1.5 ·
-		End of test pit at 1.52 m.									
-											
-											



TEST PIT RECORD: TP16-4

Page 1 of 1

Prepared by: **Kathryn Maton** Reviewed by: **Carolyn Adams**

Date (Start): 2/11/2016 Date (End): 2/11/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc.

Project Number:

Geographic Coordinates:

161-06382-00 X = 5032626 mE Y = 459424 mN

Surface Elevation: m ()

Contractor Equipment		uipment Rentals Ltd.		LYSIS y-Chlorinated Biphenyls Izene, Toluene, Ethylbenzene, Xylene	MAH PAH PH C ₁₀ -C ₅₀	Polycyclic	Aromatic	c Hydrocarbons Hydrocarbons rbons C ₁₀ -C ₅₀
VAPOUR READ	INGS	SAMPLE TYPE TM - Manual Auger TR - Trowel	Inorg. C. Inor Phenol. C. Phe	ganic Compounds enolic Compounds atil Organic Compounds (MAH & CAH)	PH C ₁₀ -C ₅₀ PH F ₁ -F ₄ Metals	Petroleum Arsenic, E	n Hydrocai Barium, Ca ead, Mang	rbons F1-F4 (C ₁₀ -C ₅₀) admium, Chromium, Cobalt, ganese, Molybdenum,
n - nexalle	H - Hexane			ctrical Conductivity	HWR			az. Waste Reg.)
	GEOLOGY / L	ITHOGRAPHY	OBSERVATIONS	SAMPLES				

		GEOLOGY / LITHOGRAPHY	OBSE	RVAT	IONS		SAMPL	_ES			
DEPTH ELEVATION (m)	LITHOGRAPHY	DESCRIPTION	VAPOR CONC. (ppm)	F M	NSUAL	S.	NUMBER	ANALYSIS	DUPLICATE	WATER ARRIVAL	REMARKS
		FILL Sand and gravel with some bricks, wood, metal and organic material, brown, moist to we	H - 0	,		TR	TP16-4 SA1			-	
-											
_											0.5 ·
-											0.5
-											
- 0.81		CLAYEY SILT brown, wet	H - 0			TR	TP16-4 SA2			_	
-			1-0				SA2				
.0 —											1.0 -
-											
1.27		End of test pit at 0.76 m.									
-											
.5 —											1.5
-											
_											
											2.0



TEST PIT RECORD: TP16-5

Page 1 of 1

Date (Start): 2/11/2016

Date (End): 2/11/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc. Reviewed by: Carolyn Adams Project Number:

Prepared by: Kathryn Maton

Geographic Coordinates:

X = 5032559 mE

161-06382-00

Y = 459440 mN

Surface Elevation: m ()

CHEMICAL ANALYSIS Contractor: A.Lacroix Equipment Rentals Ltd. Monocyclic Aromatic Hydrocarbons Equipment: **Excavator** Poly-Chlorinated Biphenyls PAH PH C₁₀-C₅₀ Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀ BTEX Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds SAMPLE TYPE Inorg. C. Petroleum Hydrocarbons C₁₀-C₂₀)
Petroleum Hydrocarbons F1-F4 (C₁₀-C₂₀)
Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
Leacheate Tests (Haz. Waste Reg.) VAPOUR READINGS PH F₁-F₄ Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH) TM - Manual Auger TR - Trowel Metals I - Isobutylene H - Hexane Diox. & Fur. Dioxins & Furans
EC Electrical Conductivity HWR OBSERVATIONS GEOLOGY / LITHOGRAPHY SAMPLES

		GEOLOGY / LITHOGRAPHY	OBSEI	RVATI	ONS		SAMPL	_ES			
DEPTH ELEVATION (m)	LITHOGRAPHY	DESCRIPTION	VAPOR CONC. (ppm)	ODOUR	NISUAL S	ι σ	NUMBER	ANALYSIS	DUPLICATE	WATER ARRIVAL	REMARKS
				Ш							
0.20		TOP SOIL									-
0.20		CLAYEY SILT brown or grey-brown, moist									0.5 —
1.14			H - 0 I - 0	,		TR	TP16-5 SA1	EC			1.0
1.5 —		End of test pit at 1.14 m.		-							- 1.5 — - -
2.0											2.0



TEST PIT RECORD: TP16-6

Page 1 of 1

Prepared by: **Kathryn Maton**Reviewed by: **Carolyn Adams**

Date (Start): 2/11/2016 Date (End): 2/11/2016

Project Name: Phase Two Environmental Site Assessment

Site: Part of Lot 4, Concession 3, Parts 1-5, Gloucester, Ontario

Sector:

Client: The Builders Warehouse Inc.

Project Number:

Geographic Coordinates:

161-06382-00 X = 5032988 mE Y = 459317 mN

Surface Elevation: m ()

CHEMICAL ANALYSIS Contractor: A.Lacroix Equipment Rentals Ltd. MAH Monocyclic Aromatic Hydrocarbons Equipment: **Excavator** Poly-Chlorinated Biphenyls PAH PH C₁₀-C₅₀ Polycyclic Aromatic Hydrocarbons Petroleum Hydrocarbons C₁₀-C₅₀ BTEX Benzene, Toluene, Ethylbenzene, Xylene Inorganic Compounds SAMPLE TYPE Inorg. C. Petroleum Hydrocarbons C₁₀-C₂₀)
Petroleum Hydrocarbons F1-F4 (C₁₀-C₂₀)
Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
Leacheate Tests (Haz. Waste Reg.) VAPOUR READINGS PH F₁-F₄ Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH) TM - Manual Auger TR - Trowel Metals I - Isobutylene H - Hexane Diox. & Fur. Dioxins & Furans
EC Electrical Conductivity HWR OBSERVATIONS GEOLOGY / LITHOGRAPHY SAMPLES

		GEOLOGY / LITHOGRAPHY	OBSEI	KVAII	ONS		SAMPL	.E3			
<u>DEPTH</u> ELEVATION (m)	LITHOGRAPHY	DESCRIPTION	VAPOR CONC. (ppm)	E ODOUR	NISUAL S	S	NUMBER	ANALYSIS	DUPLICATE	WATER ARRIVAL	REMARKS
0.5 — - 0.61 - 0.68 - 1.0 — - 1.5 —			H - 0			TR	TP16-6 SA1	PH FF4 BTEX			1.0

SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

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

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

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

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

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

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

ROCK DESCRIPTION

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

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

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

SAMPLE TYPES

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

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC% - Natural moisture content or water content of sample, %

Liquid Limit, % (water content above which soil behaves as a liquid)
 PL - Plastic limit, % (water content above which soil behaves plastically)

PI - Plasticity index, % (difference between LL and PL)

Dxx - Grain size which xx% of the soil, by weight, is of finer grain sizes

These grain size descriptions are not used below 0.075 mm grain size

D10 - Grain size at which 10% of the soil is finer (effective grain size)

D60 - Grain size at which 60% of the soil is finer

Cc - Concavity coefficient = $(D30)^2 / (D10 \times D60)$

Cu - Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:

Well-graded gravels have: 1 < Cc < 3 and Cu > 4 Well-graded sands have: 1 < Cc < 3 and Cu > 6

Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.

Cc and Cu are not applicable for the description of soils with more than 10% silt and clay

(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

p'₀ - Present effective overburden pressure at sample depth

p'c - Preconsolidation pressure of (maximum past pressure on) sample

Ccr - Recompression index (in effect at pressures below p'c)
Cc - Compression index (in effect at pressures above p'c)

OC Ratio Overconsolidaton ratio = p'_c/p'_o

Void Ratio Initial sample void ratio = volume of voids / volume of solids

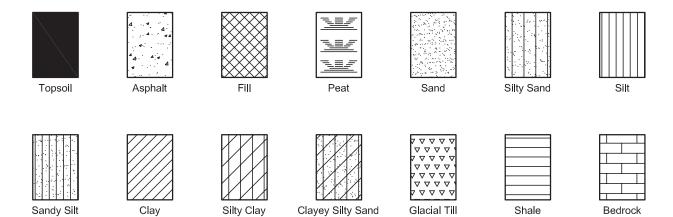
Wo - Initial water content (at start of consolidation test)

PERMEABILITY TEST

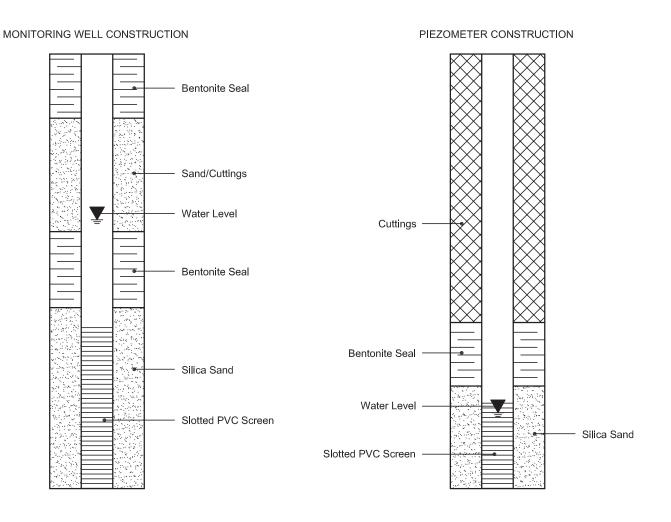
Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the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

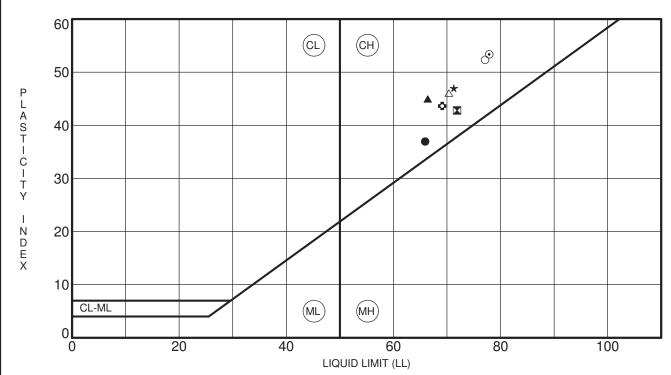
SYMBOLS AND TERMS (continued)

STRATA PLOT



MONITORING WELL AND PIEZOMETER CONSTRUCTION





S	Specimen Ider	ntification	LL	PL	PI	Fines	Classification
•	BH 1-18	SS 2	66	29	37		CH - Inorganic clays of high plasticity
×	BH10-18	SS 3	72	29	43		CH - Inorganic clays of high plasticity
	TP 1	G2	66	21	45		CH - Inorganic clays of high plasticity
*	TP 1	G3	71	24	47		CH - Inorganic clays of high plasticity
•	TP 2	G2	78	25	53		CH - Inorganic clays of high plasticity
0	TP 3	G2	69	25	44		CH - Inorganic clays of high plasticity
0	TP 4	G2	77	25	52		CH - Inorganic clays of high plasticity
	TP 5	G3	70	24	46		CH - Inorganic clays of high plasticity
Ш							
Ш							

CLIENT	Glenview Homes (Innes) Limited	FILE NO.	PG4026
PROJECT	Supplemental Geotechnical Investigation -	DATE	1 Aug 17
	2604 2646 Innes Bood	_	

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

ATTERBERG LIMITS' RESULTS

patersongroup consulting engineers

NT: TRACT NO.:		Glenviev			_	PTH: HOR TP I	No.:								1.5 - BH4-1						FILE N							34026 3542	
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																					DATE				_			Dec-18	
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		D100	D	060		D30		D	10				(Grave 0.)				Sand 0.				Silt 29	(%) 9.9			Clay 69	/ (%) 9.5
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		lm	1		_						7																—		

patersongroup **HYDROMETER** consulting engineers LS-702 ASTM-422 CLIENT: Glenview Homes DEPTH: 1.5 - 2.1 m FILE NO.: PG4026 BH OR TP No.: BH4-18 - SS3 DATE SAMPLED: 05-Dec-18 PROJECT: 3604-3636 Innes Road LAB No.: 06542 TESTED BY: D. Bertrand DATE RECEIVED: 07-Dec-18 N. Giamberardino SAMPLED BY: DATE REPT'D: 17-Dec-18 DATE TESTED: 12-Dec-18 SAMPLE INFORMATION 50.00 SAMPLE MASS 102.5 SPECIFIC GRAVITY (Gs) 2.700 REMARKS HYGROSCOPIC MOISTURE Tare No. 50.00 ACTUAL Wt. TARE Wt. AIR DRY (Wa) 150.00 100.00 OVEN DRY (Wo) 147.00 97.00 F=(Wo/Wa) 0.970 INITIAL Wt. (Ma) 50.00 Wt. CORRECTED 48.50 Wt. AFTER WASH BACK SIEVE 0.3 SOLUTION CONCENTRATION 40 g / L **GRAIN SIZE ANALYSIS** SIEVE DIAMETER (mm) WEIGHT RETAINED (g) PERCENT RETAINED PERCENT PASSING 63.0 53.0 37.5 26.5 19.0 16.0 13.2 9.5 4.75 2.0 0.0 100.0 0.0 102.5 Pan 0.00 0.850 0.0 100.0 0.04 0.425 0.1 99.9 0.10 0.250 0.2 99.8 0.23 0.5 99.5 0.106 0.30 0.075 0.6 99.4 0.30 Pan SIEVE CHECK MAX = 0.3%0.0 HYDROMETER DATA TIME Hs Нс DIAMETER (P) TOTAL PERCENT PASSING Temp. (°C) ELAPSED (24 hours) 8:38 52.5 23.0 6.0 0.0353 94.8 94.8 1 2 52.0 23.0 8:39 6.0 0.0251 93.8 93.8 5 23.0 0.0160 92.8 8:42 51.5 6.0 92.8 8:52 91.7 91.7 15 51.0 6.0 23.0 0.0093 30 9:07 50.0 6.0 23.0 0.0066 89.7 89.7 60 9:37 47.5 6.0 23.0 0.0048 84.6 84.6 250 12:47 42.0 6.0 23.0 0.0025 73.4 73.4 1440 8:37 35.0 6.0 23.0 0.0011 59.1 59.1 COMMENTS Moisture Content = 32.5% Curtis Beadow Joe Forsyth, P. Eng. Im Ru

APPROVED BY:

REVIEWED BY:

patersongroup consulting engineers

CLIENT:		Glenview Homes	DEPTH:		1.5 - 2.1 m					FILE NO:			PG4026		
CONTRACT NO.:			BH OR TP No.:		BH6-18 - SS3					LAB NO:			06543		
ROJECT:		3604-3636 Innes Road								DATE RECEI			7-Dec-18		
ATE CAMPIED.		5-Dec-18								DATE TESTE		_	12-Dec-1		
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	Clay		Silt		S		Sano	I			Gravel		Cobble		
			Silt			Fine		Medium	Coarse	Fir	ne	Coarse		bble	
ntification			ation				MC(%)	LL	PL	PI	Сс	Cu			
			Gravel (%)				30.1								
		D100 D60	D30	D10	D10				Sand (%) 0.5		Silt (%) 23.0		Clay (%) 76.5		

patersongroup **HYDROMETER** consulting engineers LS-702 ASTM-422 CLIENT: Glenview Homes DEPTH: 1.5 - 2.1 m FILE NO.: PG4026 BH OR TP No.: BH6-18 - SS3 DATE SAMPLED: 05-Dec-18 PROJECT: 3604-3636 Innes Road LAB No. : 06543 TESTED BY: D. Bertrand DATE RECEIVED: 07-Dec-18 N. Giamberardino SAMPLED BY: DATE REPT'D: 17-Dec-18 DATE TESTED: 12-Dec-18 SAMPLE INFORMATION 50.10 SAMPLE MASS 109.3 SPECIFIC GRAVITY (Gs) 2.700 REMARKS HYGROSCOPIC MOISTURE Tare No. 50.00 ACTUAL Wt. TARE Wt. AIR DRY (Wa) 150.00 100.00 OVEN DRY (Wo) 146.25 96.25 F=(Wo/Wa) INITIAL Wt. (Ma) 50.10 Wt. CORRECTED 48.22 Wt. AFTER WASH BACK SIEVE 0.26 SOLUTION CONCENTRATION 40 g / L **GRAIN SIZE ANALYSIS** SIEVE DIAMETER (mm) WEIGHT RETAINED (g) PERCENT RETAINED PERCENT PASSING 63.0 53.0 37.5 26.5 19.0 16.0 13.2 9.5 4.75 2.0 0.0 100.0 0.0 109.3 Pan 0.00 0.850 0.0 100.0 0.02 0.425 0.0 100.0 0.05 0.250 0.1 99.9 0.19 0.4 99.6 0.106 0.25 0.5 0.075 99.5 0.26 Pan SIEVE CHECK MAX = 0.3%0.0 HYDROMETER DATA TIME Hs Нс DIAMETER (P) TOTAL PERCENT PASSING Temp. (°C) ELAPSED (24 hours) 8:51 23.0 54.5 6.0 0.0344 99.5 99.5 1 2 8:52 23.0 54.5 6.0 0.0244 99.5 99.5 5 54.0 23.0 0.0155 98.4 8:55 6.0 98.4 53.5 15 9:05 6.0 23.0 0.0090 97.4 97.4 30 9:20 51.0 6.0 23.0 0.0065 92.3 92.3 60 9:50 49.0 6.0 23.0 0.0047 88.2 88.2 250 13:00 45.0 6.0 23.0 0.0024 80.0 0.08 1440 8:50 36.5 6.0 23.0 0.0011 62.5 62.5 COMMENTS Moisture Content = 30.1% Curtis Beadow Joe Forsyth, P. Eng. Im Ru

APPROVED BY:

REVIEWED BY:

APPENDIX 2

FIGURE 1 - KEY PLAN

DRAWING PG4026-1 - TEST HOLE LOCATION PLAN

DRAWING PG4026-2 - PERMISSIBLE GRADE RAISE PLAN



FIGURE 1

KEY PLAN

