



Groundwater Assessment Report

Yonge Subway Extension Project
Train Storage Facility
Environmental Project Report Addendum

Richmond Hill, Ontario

Prepared For: Toronto Transit Commission
and York Region Rapid Transit
Corporation

COMMUNITIES
TRANSPORTATION
BUILDINGS
INFRASTRUCTURE



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EXECUTIVE SUMMARY

MMM Group Limited was retained by the Toronto Transit Commission and York Region Rapid Transit Corporation to complete a groundwater assessment for a proposed 14-car Train Storage Facility (TSF) in the vicinity of the Richmond Hill Centre. The TSF is proposed to be built approximately 0.6 km north of High Tech Road to 0.1 km north of Edgar Avenue and 25 m west of the existing CN/GO railway corridor.

The Study Area for a groundwater assessment is an area within a 250-m radius of the TSF (herein referred to as the “Study Area”). The purpose of the assessment is to characterize hydrogeological conditions within the Study Area and provide recommendations for additional investigations to be completed at the preliminary and detail design stages, as necessary.

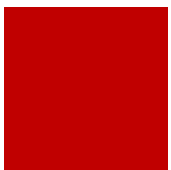
The Study Area is located within the Peel Plain physiographic region, which is a level-to-undulating tract of clay soils in the York, Peel and Halton Regions. The topography within the Study Area is flat to gently sloping, with the ground surface elevations increasing from approximately 201 masl at the Richmond Hill Centre Station to 209 masl near Coburg Crescent.

The Study Area is located within the Don River Watershed. Pomona Mills Creek, enclosed in an underground pipe, crosses the Study Area from east to west before it flows outside of the rail Right-of-Way to the west and then flows south to join the East Don River.

The Study Area has complex geology. Glaciolacustrine deposits of silt and clay with minor sand content are present predominantly within the area, with sandy silt to clayey silt till (*Halton Till*) interbedded with silt, clay, and sand and gravel exposed at the surface in the southern portion of the Study Area. The glaciolacustrine deposits form a thin veneer over the underlying deposits. The aquifers potentially present within the Study Area include the *Oak Ridges Moraine* (ORM), and lower groundwater units: *Thornccliffe Formation* and the *Scarborough Formation*.

Several geotechnical investigations were completed by Golder Associates Ltd. (Golder) between November 2008 and January 2014. Based on Golder reports, several water-bearing geological units may be encountered within the Study Area, depending on the final construction depths of the TSF.

Only limited information regarding existing local hydrogeological conditions in the Study Area is currently available. Glacial till deposits are present in the upper portion of the Study Area. These deposits are interbedded with deposits of silty clay to clayey silt. Loose to dense granular soils containing sand and gravel appear to be present beneath till at least in the southern portion of the Study Area.



Results of the groundwater level monitoring program indicate that the shallow groundwater is present at the depths of 9.0 to 10.9 mbgs within the Study Area. The deeper groundwater is present at the depths of 16.3 to 16.8 mbgs. Additional monitoring wells are required to be installed to understand the flow direction of shallow and deep groundwater in the Study Area.

Quality of shallow and deep groundwater was compared to the Storm and Sanitary Sewer Criteria of the Region of York Sewer By-law 2011-56. The results indicated that groundwater quality in the shallow and deep groundwater units is good, with the concentration of Total Suspended Solids exceeding the Storm Sewer By-law criteria in the sample collected from the deep groundwater unit.

A search of environmental records using the ERIS database revealed that none of the sources are anticipated to have a major impact on installation of the TSF. An ongoing environmental investigation for the project will provide further details regarding presence/absence of environmental impacts in the Study Area.

Potential impacts of the TSF construction to groundwater resources were evaluated by MMM. They include primarily short-term construction impacts related to dewatering.

Based on groundwater assessment results, MMM provides the following recommendations:

- ◆ Additional hydrogeological/groundwater investigations are required to better understand the hydrogeological conditions present in the Study Area, especially in the southern portion where productive aquifers may potentially be present. These studies should be completed at the detail design stage of the project, when details of the TSF design are confirmed;
- ◆ The dewatering program is likely required for groundwater control during the TSF construction. Detailed mitigation measures for groundwater control should be recommended following completion of detailed hydrogeological investigations and geotechnical assessments;
- ◆ Conclusions whether permanent dewatering measures are required to be used during operation of the TSF should be provided once hydrogeology of the Study Area is well understood and design of the TSF is confirmed.
- ◆ Erosion and sedimentation control measures will need to be developed to avoid negative impacts to the natural environment during dewatering activities;
- ◆ A Permit to Take Water (PTTW) will need to be obtained from MOE for dewatering purposes and groundwater control, prior to the TSF construction. The PTTW will specify the rates and duration of the dewatering program, a monitoring program, and mitigation and contingency measures to be used during dewatering;

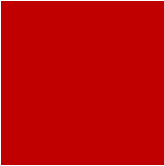
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- ◆ It is recommended to design structures in the cut-and-cover sections of the TSF as “water-tight” structures, to minimize the inflow of groundwater into the structures and avoid permanent changes to the groundwater flow regime;
 - ◆ A Soil Management Plan should be developed for re-use or disposal of excavated soils (i.e. excess soils) to be generated during the TSF construction, which would be consistent with the past TTC practices. This plan should take into consideration findings of the ongoing environmental intrusive investigation for the project.

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1.0 INTRODUCTION

1.1 Background

MMM Group Limited (MMM) was retained by the Toronto Transit Commission and York Region Rapid Transit Corporation to complete a groundwater assessment for a proposed 14-car Train Storage Facility (TSF) in the vicinity of the Richmond Hill Centre. The TSF is proposed to be built approximately 0.6 km north of High Tech Road to 0.1 km north of Edgar Avenue and 25 m west of the existing CN/GO railway corridor. The Study Area for a groundwater assessment is an area within a 250-m radius of the proposed TSF (herein referred to as the “Study Area”), shown in **Figure 1**.

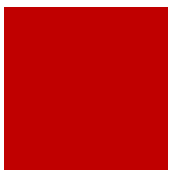
The purpose of the groundwater assessment is to characterize general hydrogeological conditions within the Study Area and provide recommendations for additional investigations to be completed at the preliminary and detail design stages, as necessary.

1.2 Project Description

Several investigations have been completed for the Yonge Subway Extension (YSE) project to-date. The objective of the project is to extend the existing Yonge Subway from its current terminus at Finch Station in the City of Toronto to approximately Highway 7 (Richmond Hill Centre) in the Town of Richmond Hill. In 2009-2010, the Toronto Transit Commission (TTC) reviewed the subway rail yard needs for the Yonge Subway to the year 2030, and determined that the train car fleet would grow from 62 trains to a total of 88 trains. This in turn, led to the conclusion that an additional 14-car TSF would be required for overnight storage of a portion of the additional vehicles, and a yard property should be purchased in the vicinity of the Richmond Hill Centre to accommodate the fleet growth beyond the year of 2030.

The requirement for the train storage at the north end of the Yonge line was identified by the TTC after the original YSE Transit Project Assessment Process (TPAP) was completed and approved by the Ministry of Environment (MOE). The implementation of the YSE project was to be the subject of an addendum to the YSE TPAP study, and therefore not documented in this assessment.

Subsequently, a Conceptual Design Study was completed by MMM Group (formerly McCormick Rankin Corporation) and Hatch Mott MacDonald in March 2012. Based on high-level screening, three train facility alignment alternatives were developed for the detailed assessment in the Conceptual Design Study. Alternative Bi, which includes construction of a three-track structure extending north from the Richmond Hill Centre Station adjacent to the existing CN/GO railway



corridor, was selected as the preferred alternative. A detailed project history is provided in the draft Environmental Project Report Addendum dated April 2014.

It is understood that underground portions of the YSE will be constructed using tunnelling with the tunnel ingress point located at Richmond Hill Centre in the middle of a parking lot. The TSF, however, will be constructed using a cut-and-cover method (MMM (a), April 2014).

1.3 Surrounding Land Use

Current land use within the Study Area is predominantly residential and commercial. Low-density with occasional high-density residential land use is present primarily in the central and northern portions of the Study Area, to the north of Beresford Drive and Bantry Road. Commercial land use is present as businesses in the southwestern portion and along the western boundary of the Study Area. Medical offices can be found in the southeastern portion of the Study Area. Office buildings are present in the southwestern portion of the Study Area. Land uses surrounding the Study Area are shown in **Figure 1**.

2.0 SITE INVESTIGATIONS

2.1 Geotechnical Investigations

Several geotechnical investigations were completed by Golder Associates Ltd. (Golder) between November 2008 and January 2014 in support of the project. The purpose of these investigations was to provide preliminary information related to soil and groundwater conditions present along the proposed TSF alignment for design and construction purposes. Groundwater details for Golder's monitoring wells MW14, BH 126A, BH 126B, BH 128A and BH 128B (**Figure 2**) are included in the report. Borehole logs of these wells are attached in **Appendix A**.

2.2 Groundwater Assessment

A groundwater assessment (i.e. this assessment) has been completed by MMM in support of the project. Details of hydrogeological conditions encountered during advancement of boreholes BH4, BH5 and BH6 and installation of monitoring wells MW4 and MW5 (**Figure 2**) for an ongoing environmental intrusive investigation for this project are included in this report.

2.2.1 Water Levels

Water levels in monitoring wells present within the Study Area were measured by MMM on March 27, 2014. Interpretation of the water level measurements is provided in Section 3.5.1.

2.2.2 Hydraulic Conductivity Testing

Hydraulic conductivity testing was completed by Golder upon MMM's request in four (4) monitoring wells BH 126A, BH 126B, BH 128A and BH 128B in July 2013. The purpose of the tests was to evaluate hydraulic conductivity of soil layers where dewatering impacts are anticipated during the TSF construction. Results of the testing completed by Golder for monitoring well MW 14 in January 2009 are also included in this report.

The purpose of the tests was to evaluate hydraulic conductivity of soils present within the Study Area. Interpretation of these results is provided in Section 3.5.2.

3.0 HYDROGEOLOGICAL SETTING

3.1 Physiography, Topography and Drainage


Physiography

According to Chapman and Putnam's "The Physiography of Southern Ontario, Third Edition" (1984), the Study Area is located within the physiographic region known as the Peel Plain. The Peel Plain is a level-to-undulating tract of clay soils and covers an area of 300 square miles across the central portions of the Regional municipalities of York, Peel and Halton. The ground surface within the Peel Plain slopes toward Lake Ontario with elevations ranging between 152 to 213 masl. Deep valleys have been cut across this plain by rivers and water streams. Much of the Peel Plain has been modified by a veneer of clay soils, which occasionally, when deep enough, have been observed to be varved. The water supply within the Plain is generally poor and the high degree of evaporation from the deforested clay surface limits the adequate recharge of groundwater (Chapman and Putnam 1984).

Topography and Drainage

The topography within the Study Area is flat to gently sloping. Based on the design drawings (see **Figures 3-1** and **3-2**), the ground surface elevations along the TSF alignment from the Richmond Hill Centre Station (north of High Tech Road) to near Coburg Crescent increase from approximately 201 metres above sea level (masl) to approximately 209 masl. In the areas where High Tech Road and Bantry Avenue cross the subway extension line and the existing CN/GO rail tracks, the road embankment surface increases by about 8 to 10 m to approximately 208 and 215 masl, respectively.

The Study Area is located within the Don River Watershed. The East Don River crosses Yonge Street approximately 1.5 km south of the Highway 407 interchange, with a tributary crossing directly through (underneath) the interchange. Pomona Mills Creek, enclosed in an underground pipe, crosses the Study Area from east to west before it flows outside of the railway's Right of Way to the west and then flows south to join the East Don River.



Stormwater run-off within the Study Area is from both primarily urban and natural areas in transition to urban land use. Stormwater is conveyed through storm sewers in the urban areas and ditches in the natural areas, respectively. All stormwater is eventually discharged into surface water courses draining into the East Don River. On the regional scale, water from the Don River is eventually discharged into Lake Ontario.

3.2 Regional Geology


The complex geology of the region has been evaluated in detail in several groundwater and hydrogeological investigations. The most notable study is a three-dimensional numerical groundwater flow model constructed for the Oak Ridges Moraine by Kassenaar and Wexler (2006), using data collected by the Conservation Authorities Moraine Coalition (CAMC) and the Regions of York, Peel and Durham and the City of Toronto (YPDT). Description of the regional geology is provided below.

According to the Ontario Geological Survey mapping “The Surficial Geology of Southern Ontario” (OGS, 2010), glaciolacustrine deposits of silt and clay with minor sand content are present predominantly within the Study Area, with Halton Till exposed at the surface in the southern portion (**Figure 4**).

The glaciolacustrine deposits generally form a thin veneer over the underlying deposits, although they can be several meters thick. The youngest deposits present beneath the glaciolacustrine deposits and sometime exposed at the surface in the watershed of Don River is *Halton Till*. Halton Till was deposited in the area approximately 13,000 years ago. It is a sandy silt to clayey silt till interbedded with silt, clay, sand and gravel. The Halton Till is a 3 to 6 m thick aquitard unit (TRCA, 2009).

The Oak Ridges Moraine (ORM) was deposited in the Don River watershed about 13,300 years ago. The ORM is a regionally extensive stratified sediment complex, which could be 150 m thick to the north. The ORM sediments are arranged from coarse to fine in a down flow direction and vertically up section. Rhythmically interbedded fine sands and silts are the predominant sediments, but coarse, diffusely-bedded sands and gravel may also be present locally. The ORM aquifer sits on the Newmarket Till and lower sediments. These deposits are generally encountered only in boreholes.

The Newmarket (Northern) Till is a dense over-consolidated aquitard unit, deposited in the area about 18,000-20,000 years ago. It is a dense silty sand diamicton up to 60 m thick and has been traced to be present beneath the ORM unit. It contains 2-5 cm thick interbeds of sand and silt, boulder pavements, fractures and joints. Discontinuous sand beds up to 1-2 m thick may also be present in this unit (TRCA, 2009).



Three (3) lower units were deposited during the Wisconsin glacial period in the Study Area. This includes the Thorncliffe Formation aquifer, Sunnybrook Drift aquitard and Scarborough Formation aquifer. *The Thorncliffe Formation* represents sand and silty sand of glaciofluvial origin deposited approximately 45,000 years ago. The Sunnybrook Drift unit was deposited about 45,000 years ago. It is interpreted to be a clast-poor mud (i.e., silt and clay), which is generally less than 10 to 20 m thick. *The Scarborough Formation* unit consists of organic-rich (peat) sands deposited over silt and clay, deposited between 70,000 and 90,000 years ago.

The underlying *bedrock* in the Study Area is mapped as grey to black shale interbedded with limestone and siltstone layers of the Georgian Bay Formation and limestone of the Simcoe Group (OGS, 1991).

3.3 Groundwater Resources

Groundwater conditions are expected to vary along the YSE alignment. Based on preliminary geotechnical reports prepared by Golder (December 2013; January 2014), several water-bearing geological units are expected to be encountered within the Study Area, depending on the TSF final construction depths. A description of these units is provided below.

Overburden Aquifer System


According to “The Hydrogeology of Southern Ontario” (Singer et al., 2003), the overburden is an important source of water supply within the jurisdiction of the Toronto and Region Conservation Authority (TRCA), which the Study Area is a part of. As described in Section 3.2, the aquifers potentially present within the Study Area include the ORM, the Thorncliffe Formation and the Scarborough Formation units. The most notable water-bearing units within the Study Area include the ORM aquifer and the Thorncliffe Formation aquifer. According to Singer et al. (2003), well yields within the Thorncliffe Aquifer range from about 10.0 to 275.0 L/min, which indicates presence of significant groundwater resources in this unit.

Bedrock Aquifer System

As described in Section 3.2, the Georgian Bay hydrogeologic unit is the main bedrock aquifer within the Study Area. This unit consists of shale interbedded with limestone and siltstone and is generally regarded as a poor source of groundwater (Singer et al, 2003). The bedrock is interpreted from well records (**Table B-1, Appendix B**) to be at least 50 m deep in the Study Area.

Groundwater Flow

On a large regional scale, the Oak Ridges Moraine is both a surface and groundwater flow divide, with water flowing either north towards Lake Simcoe or south towards Lake Ontario.



There is generally a downward gradient through the overburden deposits to the Thorncliffe Aquifer and from the Thorncliffe Aquifer into the Scarborough Aquifer, though upward gradients are interpreted in the low lying river valleys, such as the Don River valley. In the Thorncliffe Aquifer, regional groundwater flow is towards the south.

3.4 Site-Specific Geology


As discussed in Section 2.1, preliminary geotechnical investigations were completed by Golder between November 2008 and January 2014. During these investigations, MW14 was installed approximately 186 m west of the proposed TSF alignment and nested wells BH 126 A/B and BH 128 A/B were installed in the central and northern portions of the Study Area. The drilling was also completed for BH4, BH5, BH6, MW4 and MW5 (see **Figure 2**) for an environmental intrusive investigation for this project in July 2013. Details of soil and groundwater conditions encountered in the Study Area are presented in **Figures 3-1** and **3-2**. Geology in the southern portion of the Study Area is inferred from MW 14.

The borehole logs from the geotechnical and environmental investigations indicate that a 1.4 to 3.7 m thick fill is present in the central and northern portion of the Study Area below the topsoil layer. The native soils in the Study Area consist of clayey silt to silty clay till, sandy silt to silt, sand to silty sand, silty clay to clayey silt and sand and gravel.

As shown in **Figure 3-2**, clayey silt to silty clay till is present below the fill layer at the depths ranging from 2.2 to 9.5 mbgs and from 13.3 to 21.0 mbgs. Clayey silt till in the central portion is present at the depths of 3.7 to 4.9 mbgs, 14.9 to 16.3 mbgs and 17.8 to 19.4 mbgs. It appears that these deposits may potentially be present at the depths of 9.2 to 13.4 mbgs and 15.2 to 18.0 mbgs in the southern portion the Study Area (**Figure 3-1**). The till seems to be interbedded with deposits of silty clay to clayey silt at shallow depths down to 13.3 m in the northern portion of the Study Area (**Figure 3-2**). Silty clay to clayey silt deposits was found to be present at the depth of 19.4 to 22.3 mbgs in the central portion and below 20.9 mbgs in the northern portion of the Study Area. These deposits are interpreted to be present at the depth of 13.4 to 15.2 mbgs and of 18.0 to 19.8 mbgs in the southern portion of the Study Area (**Figure 3-1**).

Deposits of sandy silt, sand and silt and silt deposits are distinct at the depths of 4.9 to 8.7 mbgs, 11.7 to 14.9 mbgs, 27.0 to 29.9 mbgs and below 31.2 mbgs in the central portion of the Study Area. These deposits may be present at the depth of 1.5 to 2.3 mbgs in the southern portion of the Study Area (**Figure 3-1**).

Deposits of sand to silty sand were encountered at the shallow depths in the northern portion of the Study Area. These deposits are also present at the depths of 8.7 to 11.7 mbgs and at the depth of 26.0 to 27.0 mbgs in the central portion of the Study Area. They are interpreted to be



present at the depth of 0.2 to 1.5 mbgs, 4.6 to 9.2 mbgs, 19.8 to 21.3 mbgs, and 22.0 to 25.6 mbgs in the southern portion of the Study Area. Deposits of sand to sand and gravel may be present at the depths below 25.6 mbgs in the southern portion of the Study Area (**Figure 3-1**). Similar deposits of sand and gravel were also encountered in monitoring well BH 124 present on Garden Avenue (located southwest of the Study Area), at the elevation of 168 masl. Golder described these deposits as “upper granular deposits”, present beneath the upper till in the area (Golder, December 2013).

Additional hydrogeological / groundwater investigations are required to better understand the existing hydrogeological conditions in the Study Area, especially in the southern portion of the Study Area where productive aquifers may potentially be present. Recommendations for further investigations are provided in **Section 5.0**.

3.5 Local Hydrogeological Setting

Evaluation of local hydrogeological conditions present in the Study Area was completed using MOE water well records, drilling results from geotechnical investigations carried out for the project and information available from the literature.


3.5.1 Historical Groundwater Use

Based on review of MOE water well records (Table B-1, **Appendix B**) in the Study Area, the static water levels in the Study Area range from 2 mbgs to 29 mbgs. Based on details of short-duration pumping tests completed for installation of wells in the Study Area, the well yields range from 18.2 L/min to 45.5 L/min (4 to 10 IGPM), indicating that the soils have moderate transmissivity but would provide sufficient water volumes for domestic use. Most of the wells historically screened in the Study Area are overburden wells. Bedrock was encountered in one (1) well at the depth below 50 mbgs.

Well yields and local geological conditions indicate that local shallow aquifers have a good water yielding capacity. Additional information is required to evaluate hydrogeological characteristics in the Study Area.

3.5.2 Local Hydrogeology

Only limited information regarding existing local hydrogeological conditions in the Study Area is currently available. As shown in **Figures 3-1** and **3-2**, glacial till deposits are present in the upper portion of the Study Area. These deposits are interbedded with deposits of silty clay to clayey silt. Loose to dense granular soils containing sand and gravel appear to be present beneath till at least in the southern portion of the Study Area (**Figure 3-1**).



The Oak Ridges Moraine or equivalent aquifer may potentially be interbedded with the upper portion of the till deposits in the Study Area. According to Golder's interpretation (December 2013), the ORM or equivalent aquifer is present at elevations ranging between approximately 192 and 202 masl in BH 126 A/B and is present at elevations of 189 to 197 masl in MW14. A deep groundwater unit containing silty sand to sandy silt appears to be present at elevations 181 masl and 179 masl in the central and southern portions of the Study Area, respectively (**Figure 3-1**). Additional hydrogeological investigations are required to delineate the extent of this aquifer in the Study Area.

3.5.3 *Local Groundwater Flow*

MMM measured groundwater levels in the wells present in the Study Area on March 27, 2014 (see **Table 1**). As can be seen from **Table 1** and **Figures 3-1** and **3-2**, the shallow groundwater is present at the depths of 9.0 to 10.9 mbgs within the Study Area. The deeper groundwater unit water levels were found to be present at the depths of 16.3 to 16.8 mbgs in the Study Area. Additional monitoring wells are required to be installed to understand the flow direction of shallow and deep groundwater in the Study Area.

Table 1: Depth to Groundwater in Study Area

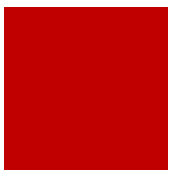
Monitoring Well	Well Depth (mbgs)	Depth to GW (mbgs) – March 27, 2014	GW Elev (masl) – March 27, 2014
MW4	9.75	8.96	200.02
MW5	11.28	9.19	200.30
BH126 A	33.30	16.29	191.17
BH126 B	14.30	10.87	196.49
BH128 A	34.70	16.75	193.19
BH128 B	13.20	9.22	200.77

3.5.4 Hydraulic Conductivity Testing

Hydraulic conductivity testing was completed by Golder in monitoring wells to estimate the hydraulic conductivity of soils present in the Study Area. This included completing one (1) test in MW 14 in January 2009 and four (4) tests in BH 126A, BH 126B, BH 128A and BH 128B in July 2013 (**Figure 2**). Estimates of hydraulic conductivity are presented in **Table 2** below. Hydraulic Conductivity test curves are attached in **Appendix C**.

Table 2: In Situ Permeability Testing Summary

Monitoring Well	Screen Interval (mbgs)	Description	*K (m/sec)
MW 14	22.1 – 22.4	Sand, some silt and gravel	2×10^{-5}
BH 126 A	30.3 – 33.3	Silty Sand; Sandy Silt, trace gravel; Silt, some sand	$< 1 \times 10^{-8}$
BH 126 B	11.3 – 14.3	Sandy Silt, trace gravel; Silt, some clay, trace sand	5×10^{-6}
BH 128 A	31.7 – 34.7	Silty Clay, trace sand, silt and sand seam; Clayey Silt, trace sand, occasional silt seams	1×10^{-7}
BH 128 B	10.2 – 13.2	Silt, trace sand	2×10^{-6}



The recovery data from the tests was analysed using the Hvorslev (1951) approach (Golder 2009 and 2014). The values shown are considered representative of horizontal hydraulic conductivity in the immediate vicinity of the wells. It is anticipated that the vertical hydraulic conductivities with depth will be an order of magnitude lower than the shown values.

The estimated values indicate that dense silty sand to sandy silt to silt in the screened interval of BH 126A and till deposits in the screened interval of BH 128A have a moderate to low permeability, and are values consistent with soil descriptions. The results also show that the hydraulic conductivity of the upper granular deposits (i.e., 2×10^{-6} and 5×10^{-6} m/s in BH 126A and BH 128 A) and of granular deposits below till in MW 14 (i.e., 2×10^{-5} m/s) have a moderate to high permeability, which are expected, given the description of the screened soil layers.

3.5.5 *Groundwater Quality*


Baseline groundwater quality was analysed by Golder for evaluation of dewatering discharge options. Samples of groundwater were collected from a shallow well BH 126B and a deep well BH 128A in September 2013. The results of the analyses were compared to the Storm and Sanitary Sewer Criteria of the Region of York Sewer By-law 2011-56. The results indicated that groundwater quality in the shallow and deep groundwater units is good, with the concentration of Total Suspended Solids of 170 mg/L exceeding the Storm Sewer By-law criteria of 10 mg/L in the sample collected from BH 128A. A summary of results is presented in **Tables D-1** through **D-6 (Appendix D)**. Certificates of Analysis are presented in **Appendix D**. Recommendations for the dewatering discharge are provided in Section 5.0.

3.6 Existing Natural Features

Natural features present within the Study Area include a natural area and a landscaped area present to the northwest and southwest of Beresford Drive and CN/GO railway corridor, respectively. Pomona Creek flows from west to east in the southern portion of the Study Area (**Figure 5**).

4.0 ASSESSMENT OF POTENTIAL IMPACTS OF TSF TO GROUNDWATER

As discussed in the EPR (MMM (a), April 2014), impacts of the TSF construction to natural features present in the Study Area will include displacement impacts, construction impacts and operation and maintenance impacts. While construction impacts are short-term impacts related to construction of the TSF, impacts related to operation and maintenance of the TSF are long-term impacts. Impacts to the natural environment related to displacement of the existing natural features due to construction of the TSF are permanent (i.e. irreversible).



Potential impacts of the project to groundwater users and natural environment are discussed below.

Displacement Impacts

Impacts to the natural environment are discussed in detail in the EPR report. These impacts would include primarily vegetation clearing in the Study Area. The impacts to Pomona Creek related to construction of the TSF are anticipated to be insignificant due to Pomona Creek enclosure in an underground pipe and the limited surficial water travelling through this drainage feature. It appears that Pomona Creek does not provide direct or indirect fish habitat (MMM (a), April 2014).

Construction Impacts

Based on currently available groundwater information, it is anticipated that dewatering will likely be required to temporarily reduce the groundwater levels and pressure in the upper and lower aquifers for construction of the TSF structure. Detailed geotechnical and groundwater investigations will provide further insight as to whether the upper aquifer in the southern portion of the Study Area is the ORM or equivalent aquifer. The further studies should also shed light on the nature of the granular deposits which may potentially be present below the till layer in the southern portion. Recommendations for the groundwater control are provided in Section 5.0.

Operation and Maintenance Impacts

No permanent effects are anticipated to occur to groundwater after construction of the TSF. Conclusions whether permanent dewatering measures are required to be used during operation of the TSF should be provided once hydrogeology of the Study Area is well understood and design of the TSF is confirmed. Recommendations to mitigate any possible groundwater issues are provided in Section 5.0.

4.1 Environmental Database Query – Ecolog ERIS

MMM completed a comprehensive environmental database search, by requesting a report from the Ecolog Environmental Risk Information Services (ERIS) database. The records were requested for an area of 250 meters radially around the proposed TSF footprint (i.e. the Study Area), in order to identify locations of potential concerns regarding soil and groundwater quality for the TFS installation. A copy of the Ecolog ERIS report is attached in **Appendix E**. Results of the main environmental data points from the Ecolog ERIS search are presented in **Figure 5**.

As presented in the Ecolog ERIS report, the following environmental records were found for the Study Area:

- ◆ Two (2) records for Certificates of Approvals issued by MOE for the heating/ air conditioner unit and the diesel generator at 50 High Tech Road;

- ◆ Two (2) records for Technical Standards and Safety Authority (TSSA) Historic Incidents;
- ◆ Two (2) records for Waste Generators as per O. Reg. 347;
- ◆ One (1) record in the Scott's Manufacturing Directory;
- ◆ Two (2) records for pesticide register;
- ◆ One (1) record for Record of Site Condition completed within the Study Area;
- ◆ Two (2) records for ERIS historic searches completed within the Study Area;
- ◆ Four (4) records for boreholes advanced in the Study Area;
- ◆ Eight (8) records for monitoring wells installed in the Study Area.


In addition to the records described above, the CN / GO railway corridor exists to the east of the proposed TSF footprint.

None of the environmental records / sources described above is anticipated to have a major impact on installation of the TSF. Areas of Potential Environmental Concern (APECs) were identified by MMM in a Contamination Overview Study completed for this project (MMM (b), April 2014). Based on the conclusions of the COS, the APEC which may impact the TSF installation is a CN/GO railway corridor, present to the east of the TSF. An ongoing environmental investigation for this project will provide further details regarding presence/absence of environmental impacts in the Study Area.

5.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

The following is a summary of results obtained during the groundwater assessment. The purpose of the groundwater assessment was to characterize general hydrogeological conditions within the Study Area and provide recommendations for additional investigations to be completed, as necessary:

- ◆ The Study Area is located within the Peel Plain physiographic region a level-to-undulating tract of clay soils that covers the central portions of the York, Peel and Halton Regions.
- ◆ The topography within the Study Area is flat to gently sloping. The ground surface elevations along the TSF alignment from the Richmond Hill Centre Station to near Coburg Crescent increase from approximately 201 to 209 masl.
- ◆ The Study Area is located within the Don River Watershed. Pomona Mills Creek, enclosed in an underground pipe, crosses the Study Area from east to west before it flows outside of the rail Right-of-Way to the west and then flows south to join the East Don River.
- ◆ The Study Area has complex geology with a veneer of glaciolacustrine deposits of silt and clay with minor sand content present predominantly within the region, overlying sandy silt to clayey silt till (*Halton Till*) interbedded with silt, clay, sand and gravel exposed at the surface in the southern portion of the Study Area.

- 
- ◆ The aquifers potentially present within the Study Area include the *Oak Ridges Moraine (ORM)*, and lower groundwater units: *Thornccliffe Formation* and the *Scarborough Formation*.
 - ◆ Several geotechnical investigations were completed by Golder between November 2008 and January 2014. Based on Golder reports, several water-bearing geological units may be encountered within the Study Area, depending on the final construction depths.
 - ◆ The Study Area relies on the municipal water supply now from a lake-based source. Based on details of short-duration pumping tests completed for installation of water wells in the Study Area, the well yields range from 18.2 L/min to 45.5 L/min (4 to 10 IGPM), indicating that the soils have moderate transmissivity.
 - ◆ Only limited information regarding existing local hydrogeological conditions in the Study Area is currently available. Glacial till deposits are present in the upper portion of the Study Area. These deposits are interbedded with deposits of silty clay to clayey silt. Loose to dense granular soils containing sand and gravel appear to be present beneath till at least in the southern portion of the Study Area.
 - ◆ Results of the groundwater level monitoring program indicate that the shallow groundwater is present at the depths of 9.0 to 10.9 mbgs within the Study Area. The deeper groundwater levels are present at the depths of 16.3 to 16.8 mbgs. Additional monitoring wells are required to understand the flow direction of shallow and deep groundwater in the Study Area.
 - ◆ Quality of shallow and deep groundwater was compared to the Storm and Sanitary Sewer Criteria of the Region of York Sewer By-law 2011-56. The results indicated that groundwater quality in the shallow and deep groundwater units is good, with the concentration of TSS exceeding the Storm Sewer by-law criteria in the sample collected from the deep unit.
 - ◆ A search of environmental records using the ERIS database revealed that none of the sources are anticipated to have a major impact on installation of the TSF. An ongoing environmental investigation for the project will provide further details regarding presence/absence of environmental impacts in the Study Area.
 - ◆ Potential impacts of the TSF construction to groundwater resources are primarily short-term construction impacts related to dewatering.
 - ◆ Based on groundwater assessment results, MMM provides the following recommendations:
 - Additional hydrogeological/groundwater investigations are required to better understand the hydrogeological conditions present in the Study Area, especially in the southern portion where productive aquifers may potentially be present. These studies should be completed at the detail design stage of the project, when details of the TSF design are confirmed;
 - The dewatering program is likely required for groundwater control during the TSF construction. Detailed mitigation measures for groundwater control should be recommended following completion of detailed hydrogeological investigations and geotechnical assessments;

- Conclusions whether permanent dewatering measures are required to be used during operation of the TSF should be provided once hydrogeology of the Study Area is well understood and design of the TSF is confirmed;
- Erosion and sedimentation control measures will need to be developed to avoid negative impacts to the natural environment during dewatering activities;
- A Permit to Take Water (PTTW) will need to be obtained from MOE for dewatering purposes and groundwater control, prior to the TSF construction. The PTTW will specify the rates and duration of the dewatering, a monitoring program, and mitigation and contingency measures to be used during dewatering;
- It is recommended to design structures in the cut-and-cover sections of the TSF as “water-tight” structures, to minimize the inflow of groundwater into the structures and avoid permanent changes to the groundwater flow regime;
- Several geotechnical requirements would need to be considered for the TSF construction, which may include temporary ground support systems, design of dewatering systems and backfilling specifications, and potentially address the ground movement issues;
- A Soil Management Plan should be developed for re-use or disposal of excavated soils (i.e. excess soils) to be generated during the TSF construction, which would be consistent with the past TTC practices. This plan should take into consideration findings of the ongoing environmental intrusive investigation for the project.

6.0 QUALIFICATIONS OF THE CONSULTANT

6.1 MMM Group Limited

For six decades, MMM Group Limited has offered comprehensive consulting services in design, planning, project management, contract administration and construction inspection services in the environmental engineering, municipal engineering, urban development and recreational development fields. The firm employs over 2,000 professional, technical and administrative staff, in offices across Canada with expertise in all facets of the environmental field. The Environmental Management Department specializes in conducting Phase One, Two and Three Environmental Site Assessments, hazardous materials assessment, removal of underground storage tanks, groundwater investigations and site remediation.

6.2 Qualified Person

The groundwater assessment was completed by **Ms. Natalia Codoban, M.Eng., P.Eng.**, a Hydrogeologist/ Project Manager in the Environmental Management Department. Ms. Codoban has an academic background in Earth/ Environmental Sciences and Geology, and Environmental Engineering. She has over nine (9) years of consulting experience in completing

and managing hydrogeological and environmental investigations. Natalia has provided expertise to numerous clean water and contaminant groundwater investigations, hydrogeological studies, Permit to Take Water (PTTW) applications, water balance evaluations and on-site servicing projects, development impact assessments, landfill assessments, modelling groundwater flow and contaminant plume migration, seepage analyses and dewatering evaluations.

The groundwater assessment was reviewed by **Mr. Murray Gomer, M.Sc., P.Geo.**, a Senior Hydrogeologist and an Associate of the Company. Murray has over 32 years of experience as a consulting hydrogeologist and project manager in a wide range of overburden and bedrock terrain and geological conditions. Relevant experience includes: development impact assessment, on-site servicing, watershed studies and water balance evaluation, water resources development and protection, dewatering, waste management plans, siting and monitoring for municipal landfills, industrial and radioactive waste sites, contaminated sites assessment (brownfields), remedial action, expert witness (OMB), and environmental assessment under the Ontario EAA, EPA and under CEAA.

6.3 Signatures



Report Authored By:



The seal is circular with the text "LICENSED PROFESSIONAL ENGINEER" at the top and "PROVINCE OF ONTARIO" at the bottom. Inside the seal, the name "N. CODOBAN" and the number "100117020" are printed. Handwritten in blue ink are the date "July 2, 2014" and the year "2014".

Natalia Codoban, M.Eng, P. Eng.
Hydrogeologist/ Project Manager

Report Reviewed By:



The seal is circular with the text "PROFESSIONAL GEOSCIENTIST" at the top and "ONTARIO" at the bottom. Inside the seal, there is a stylized flower logo. Printed text includes "MURRAY D. GOMER" and "PRACTISING MEMBER 1296". Handwritten in blue ink are the date "July 2, 2014" and the name "Murray Gomer".

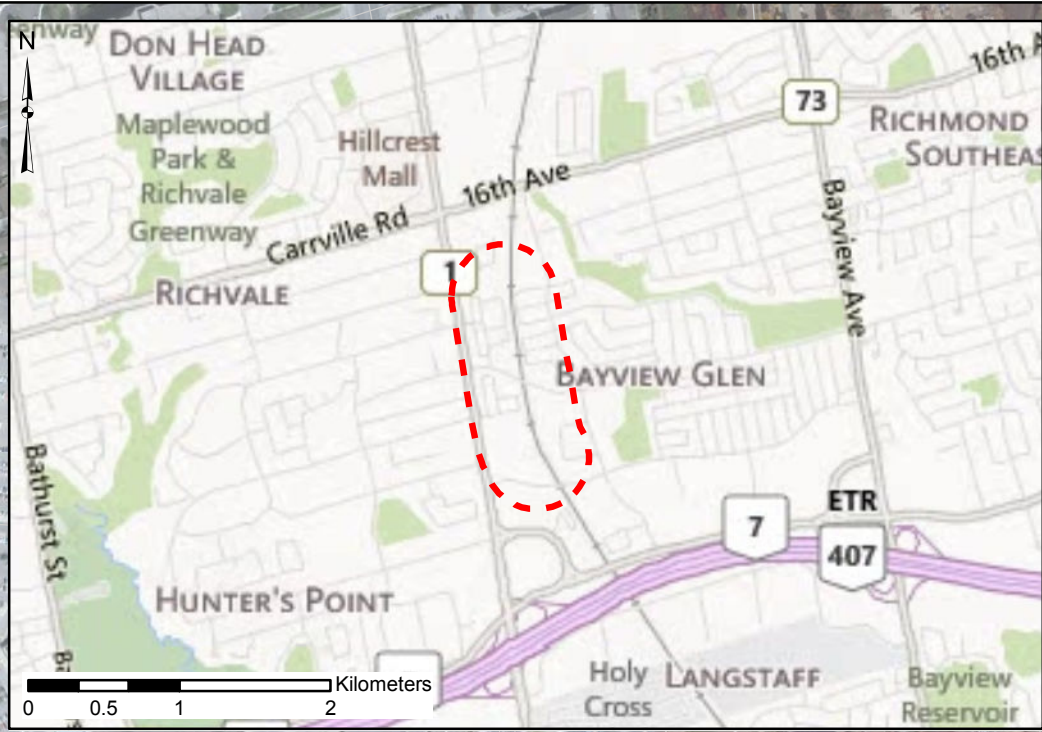
Murray Gomer, M.Sc, P. Geo.
Senior Hydrogeologist/ Senior Project Manager

7.0 REFERENCES

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8.0 STANDARD LIMITATIONS

A copy of Standard Limitations is attached in **Appendix F**.



Legend

- Proposed Train Storage Facility Alignment
- Proposed Train Storage Facility Study Area

0 100 200 300 400 Meters

Scale: As Shown

REFERENCE
 Imagery © 2014 Microsoft Corporation and its data suppliers
<http://www.bing.com/maps>
 Projection: UTM Zone 17N Datum: NAD 83



A member of  MMM GROUP

GROUNDWATER ASSESSMENT
 YONGE SUBWAY EXTENSION EPR ADDENDUM
 RICHMOND HILL, ONTARIO

STUDY AREA LOCATION PLAN

DATE:
 APRIL 2014

PROJECT:
 33-77670

FIGURE
 1



0 100 200 300 Meters

Scale: As Shown

REFERENCE
 Imagery © 2014 Microsoft Corporation and its data suppliers
<http://www.bing.com/maps>
 Projection: UTM Zone 17N Datum: NAD 83



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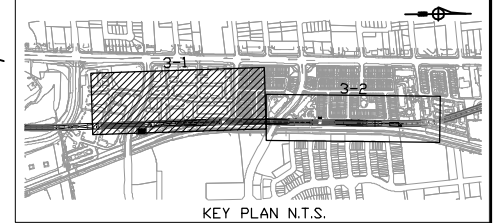
GROUNDWATER ASSESSMENT
 YONGE SUBWAY EXTENSION EPR ADDENDUM
 RICHMOND HILL, ONTARIO

BOREHOLES AND MONITORING WELLS

DATE:
 APRIL 2014

PROJECT:
 32-77670

FIGURE
 2

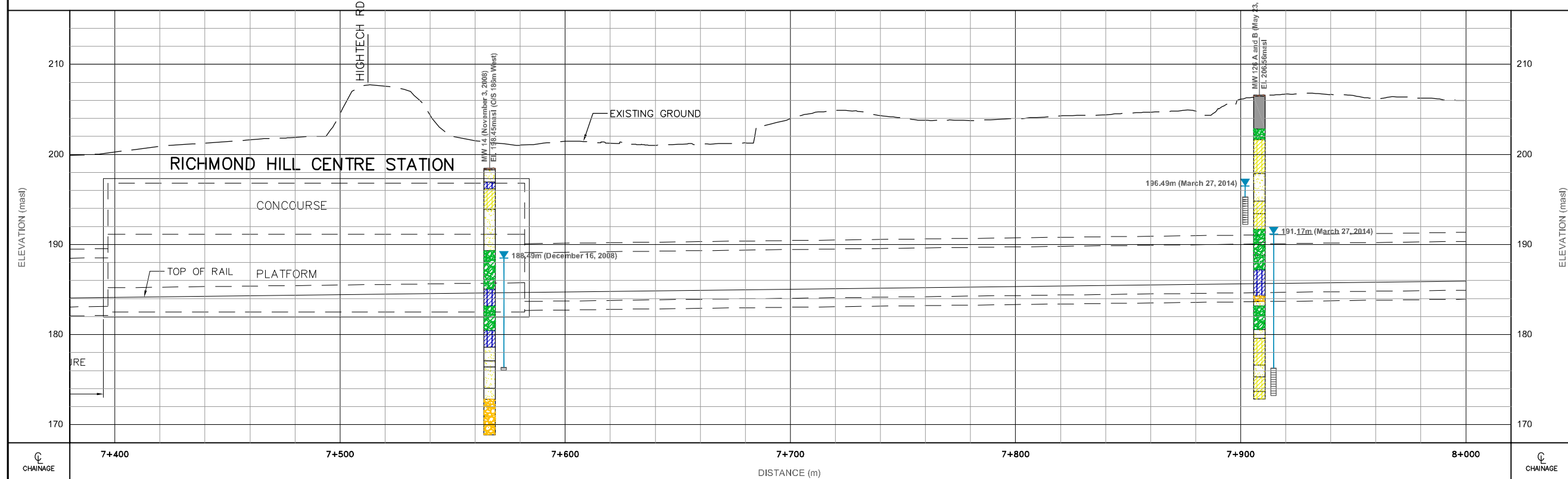
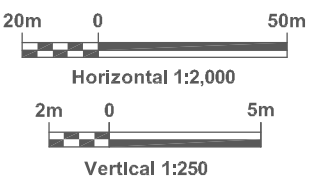


MATCH LINE STA. 8+000
SEE DRAWING 3-2

LEGEND

- TOPSOIL
- FILL
- SAND TO SILTY SAND
- SAND AND GRAVEL
- SILTY CLAY TO CLAYEY SILT
- SANDY SILT TO SAND AND SILT TO SILT
- GLACIAL TILL

- MW 4 El. 208.09masl — BOREHOLE ID.
- BOREHOLE ELEVATION
- DEPTH GROUNDWATER WAS FOUND (masl)
- DEPTH GROUNDWATER WAS FOUND UPON BOREHOLE ADVANCEMENT (masl)
- STATIC GROUNDWATER ELEVATION (masl)
- WELL SCREEN

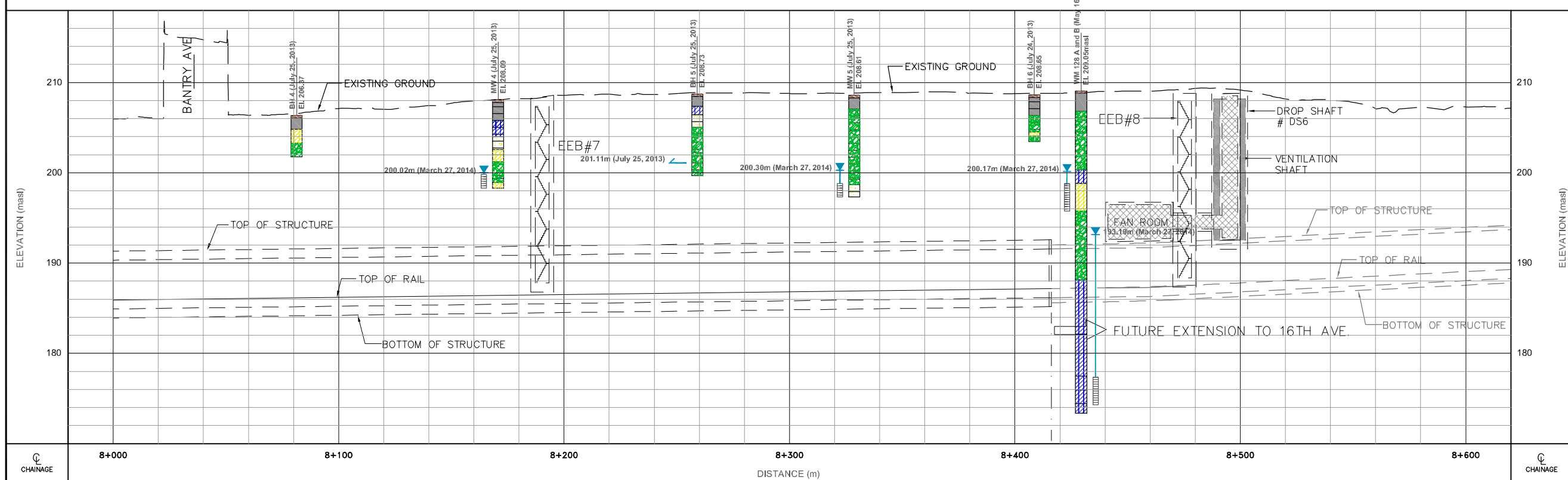
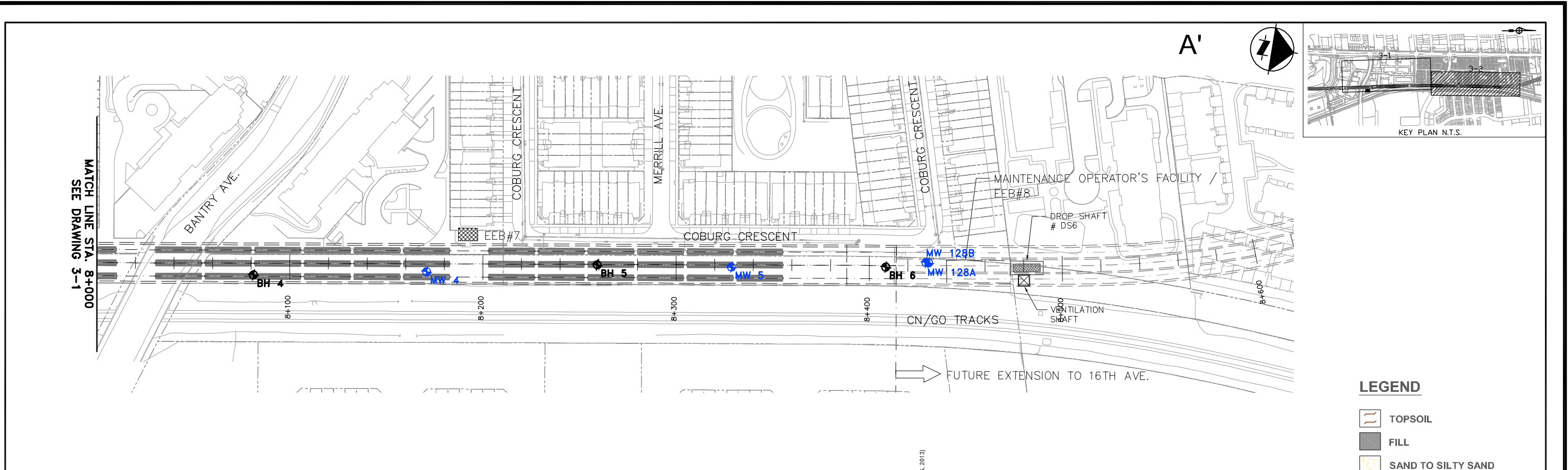


HYDROGEOLOGICAL CROSS-SECTION A-A' AND CONCEPTUAL DESIGN OF TRAIN STORAGE FACILITY
YONGE SUBWAY EXTENSION EPR ADDENDUM
RICHMOND HILL, ONTARIO



April 2014
PROJECT: 3277670
FIGURE: 3-1

7767-Hydrogeological Cross Section A-A.dwg 3-1 I:\Drawings\Transit\7767 Yonge Subway Extension\Design\16th\Hydrogeological Cross-Sections - Ecoplans\ Apr 02, 2014 - 1:40pm



LEGEND

- TOPSOIL
- FILL
- SAND TO SILTY SAND
- SAND AND GRAVEL
- SILTY CLAY TO CLAYEY SILT
- SANDY SILT TO SAND AND SILT TO SILT
- GLACIAL TILL

MW 4 — BOREHOLE ID.
 EL. 208.09masl — BOREHOLE ELEVATION

—> DEPTH GROUNDWATER WAS FOUND (masl)
 <-> DEPTH GROUNDWATER WAS FOUND UPON BOREHOLE ADVANCEMENT (masl)
 —> STATIC GROUNDWATER ELEVATION (masl)

— WELL SCREEN

20m 0 50m
 Horizontal 1:2,000
 2m 0 5m
 Vertical 1:250



HYDROGEOLOGICAL CROSS-SECTION A-A' AND CONCEPTUAL DESIGN OF TRAIN STORAGE FACILITY
 YONGE SUBWAY EXTENSION EPR ADDENDUM
 RICHMOND HILL, ONTARIO

April 2014
 PROJECT: 3277670
 FIGURE: 3-2

7767-Hydrogeological Cross Section A-A.dwg 3-2 I:\Drawings\Transit\7767 Yonge Subway Extension\Design\16th\Hydrogeological Cross-Sections - Ecoplans\ Apr 02, 2014 - 1:39pm



Legend

- - Proposed Alignment for Train Storage Facility
- - Proposed Train Storage Facility Study Area

Monitoring Locations

- Monitoring Well (Golder, Nov. 2008)
- Monitoring Well (Golder, May 2013)
- Borehole (MMM, July 2013)
- Monitoring Well (MMM, July 2013)
- Proposed Borehole
- Proposed Monitoring Well

Quaternary Geology

- 5b - Newmarket Till: Sandy silt to silty sand
- 8a - Glacio-lacustrine clayey silt
- 9c - Glacio-lacustrine sand & silty sand

0 100 200 300 Meters

Scale: As Shown

REFERENCE
 Imagery © 2014 Microsoft Corporation and its data suppliers
[http://www.bing.com/maps/Projection: UTM Zone 17N Datum: NAD 83. OGS \(2010\), Surficial Geology of Southern Ontario, Misc Release 128.](http://www.bing.com/maps/Projection: UTM Zone 17N Datum: NAD 83. OGS (2010), Surficial Geology of Southern Ontario, Misc Release 128.)



GROUNDWATER ASSESSMENT
 YONGE SUBWAY EXTENSION EPR ADDENDUM
 RICHMOND HILL, ONTARIO

STUDY AREA QUATERNARY GEOLOGY

DATE:
APRIL 2014

PROJECT:
32-77670

FIGURE

4



0 100 200 300 Meters

Scale: As Shown

REFERENCE
 Imagery © 2014 Microsoft Corporation and its data suppliers
<http://www.bing.com/maps>
 Projection: UTM Zone 17N Datum: NAD 83



GROUNDWATER ASSESSMENT
 YONGE SUBWAY EXTENSION EPR ADDENDUM
 RICHMOND HILL, ONTARIO
POTENTIAL CONTAMINANT SOURCES

DATE:
 APRIL 2014

PROJECT:
 32-77670

FIGURE

5

PROJECT: 09-1111-6091 (6000)

RECORD OF BOREHOLE: BH 126

SHEET 1 OF 4

LOCATION: N 4855836.4 ; E 626342.6

BORING DATE: May 17, 2013 - May 23, 2013

DATUM: Geodetic

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm



Toronto Transit Commission

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH Cu, kPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER TYPE	BLOWS/0.3m	100 200 300 400	100 200 300 400	20 40 60 80	nat V. - rem V. -	Q - U -	Wp W Wi	Well B Stick-up 0.73m		Well A Stick-up 0.77m	
0		GROUND SURFACE		206.56												
		TOPSOIL		0.00 0.10												
		Firm to stiff, brown SILTY CLAY, sandy to some sand, trace to some gravel, oxidation stains, rootlets, decomposed organic matter, sand seams; FILL (CL)			1 SS 10	ND										
1					2 SS 7	⊕										
2					3 SS 14	⊕										
3					4 SS 13	⊕										
4					5 SS 7	ND										
		Firm to stiff, brown SILTY CLAY, sandy to some sand, trace gravel; TILL (CL)		202.83 3.73												
4					6 SS 5	⊕									MH	
5					7 SS 9	ND										
		Loose to compact, moist to wet, brown SAND and SILT, trace gravel, trace clay, pockets of silty clay, stratified; (ML/SP)		201.63 4.93											Grout	Grout
6					8 SS 14	⊕										
7																
8					9 SS 17	⊕									MH	
9																
		Dense, wet, brown SILTY FINE SAND, trace gravel, stratified; (SM)		197.87 8.69												
9					10 SS 38	⊕										
10															Bentonite	

CONTINUED NEXT PAGE

MIS-TTC-BHS 001_0911116091.GPJ_GAL-MISS.GDT_31/10/13 DATA INPUT:

DEPTH SCALE

1 : 50



LOGGED: RA

CHECKED: RL

PROJECT: 09-1111-6091 (6000)

RECORD OF BOREHOLE: BH 126

SHEET 2 OF 4

LOCATION: N 4855836.4 ; E 626342.6

BORING DATE: May 17, 2013 - May 23, 2013

DATUM: Geodetic



Toronto Transit Commission

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH C_u , kPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	nat V. - + Q - rem V. - ⊕ U - ○				WATER CONTENT PERCENT				Well B Stick-up 0.73m	Well A Stick-up 0.77m	
								% LEL Methane				Wp ----- W ----- Wi						
-- CONTINUED FROM PREVIOUS PAGE --																		
10	Power Auger	Very dense, wet, brown to grey, fine to medium SAND, some silt, oxidation stain stratified; (SP)	[Strata Plot]	196.43	11	SS	66	ND									Bentonite	
				10.13														
11				194.83	12	SS	50/25mm										Screen	
		Very dense, wet, brown SANDY SILT, trace gravel; (SM)		11.73														
12				193.45	13	SS	98/275mm										MH	
		Very dense, wet, grey SILT, some clay, trace sand; (ML)		13.11														
13				191.70	14	SS	50										MH	
	Mud Rotary 110 mm Tricone Bit	Hard, grey SILTY CLAY, sandy, trace gravel; TILL (CL)		14.86														
14				190.25	15	SS	84										MH	
		Hard, grey CLAYEY SILT, trace sand, silty sand seams; (ML)		16.31														
15				188.81	16	SS	59										Grout	
		Hard, grey, CLAYEY SILT, sandy, some gravel; TILL (MC)		17.75														
16				187.21	17	SS	25											
		Very stiff, grey SILTY CLAY to CLAYEY SILT, trace sand, trace gravel, sand seams; (CL-ML)		19.35														
17				CONTINUED NEXT PAGE														

MIS-TTC-BHS 001_0911116091.GPJ_GAL-MISS.GDT_31/10/13 DATA INPUT:

DEPTH SCALE

1 : 50



LOGGED: RA

CHECKED: RL

PROJECT: 09-1111-6091 (6000)

RECORD OF BOREHOLE: BH 126

SHEET 3 OF 4

LOCATION: N 4855836.4 ; E 626342.6

BORING DATE: May 17, 2013 - May 23, 2013

DATUM: Geodetic

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm



Toronto Transit Commission

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH C_u , kPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100	200	300	400	nat V. rem V.	+		Q	-	U	Well B Stick-up 0.73m
20	Mud Rotary 110 mm Tricone Bit	-- CONTINUED FROM PREVIOUS PAGE --																
		Very stiff, grey SILTY CLAY to CLAYEY SILT, trace sand, trace gravel, sand seams; (CL-ML)		17	SS	25	ND											
21																		
22					18	SS	22	ND										
			Wet, grey SAND AND GRAVEL, inferred from drilling; (SP/GP)	184.31														
				22.25														
23			Very dense, wet, grey SILTY SAND, some gravel; (SM)	183.70														
				22.86														
			Hard, grey CLAYEY SILT and SAND, trace gravel; TILL (CL-ML)	183.19	19A	SS	58	ND										
				23.37	19B			ND										
24																		
25				20	SS	50	ND											
26		Dense, wet, grey SILTY SAND, some gravel; (SM)	180.58															
			25.98		21	SS	42	⊕										
27		Very dense, wet, grey SAND and SILT, stratified; (SP/ML)	179.59															
			26.97															
28					22	SS	87/275mm	⊕										
29		Very dense, wet, grey SILT, some clay, trace sand; (ML)	178.06															
			28.50		23	SS	50/100mm	ND										
30			176.66															
			29.90															
		CONTINUED NEXT PAGE																

MIS-TTC-BHS 001_0911116091.GPJ_GAL-MISS.GDT_31/10/13 DATA INPUT:

DEPTH SCALE

1 : 50



LOGGED: RA

CHECKED: RL

PROJECT: 09-1111-6091 (6000)

RECORD OF BOREHOLE: BH 126

SHEET 4 OF 4

LOCATION: N 4855836.4 ; E 626342.6

BORING DATE: May 17, 2013 - May 23, 2013

DATUM: Geodetic

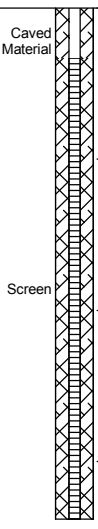
SAMPLER HAMMER, 63.5 kg; DROP, 760 mm



Toronto Transit Commission

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH C_u , kPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION Well B Stick-up 0.73m Well A Stick-up 0.77m																											
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100	200	300	400	nat V. -	rem V. -			Q -	U -																									
30	Mud Rotary 110 mm Tricone Bit	--- CONTINUED FROM PREVIOUS PAGE ---																																								
		Very dense, wet, grey SILTY SAND, stratified; (SM)																																								
31				175.32	24	SS	50/75mm	ND																																		
		Very dense, wet, grey SANDY SILT, trace gravel; (ML)		31.24																																						
32				173.72	25	SS	76/150mm	ND																																		
	Very dense, wet, grey SILT, some sand; (ML)		32.84																																							
33				172.88	26	SS	90/150mm	ND																																		
	END OF BOREHOLE		33.68																																							
34	<p>NOTES:</p> <p>1. A 50 mm diameter deep monitoring well (A) was installed at a depth of 33.38m below ground surface in the completed borehole.</p> <p>2. A 50 mm diameter shallow monitoring well (B) was installed at a depth of 14.33m below ground surface in a new borehole (N 4855834.3; E 626343.1) adjacent to the completed borehole.</p> <p><u>Water level measurements:</u></p> <p>Monitoring Well A (Ground surface elevation 206.56m)</p> <table border="1"> <tr><th>Date</th><th>Depth</th><th>Elevation</th></tr> <tr><td>03/07/2013</td><td>14.90m</td><td>191.66m</td></tr> <tr><td>13/09/2013</td><td>14.86m</td><td>191.70m</td></tr> <tr><td>30/09/2013</td><td>14.97m</td><td>191.59m</td></tr> </table> <p>Monitoring Well B (Ground surface elevation 206.54m)</p> <table border="1"> <tr><th>Date</th><th>Depth</th><th>Elevation</th></tr> <tr><td>24/05/2013</td><td>10.02m</td><td>196.52m</td></tr> <tr><td>03/07/2013</td><td>10.11m</td><td>196.43m</td></tr> <tr><td>13/09/2013</td><td>10.08m</td><td>196.46m</td></tr> <tr><td>30/09/2013</td><td>10.08m</td><td>196.46m</td></tr> </table>															Date	Depth	Elevation	03/07/2013	14.90m	191.66m	13/09/2013	14.86m	191.70m	30/09/2013	14.97m	191.59m	Date	Depth	Elevation	24/05/2013	10.02m	196.52m	03/07/2013	10.11m	196.43m	13/09/2013	10.08m	196.46m	30/09/2013	10.08m	196.46m
Date	Depth	Elevation																																								
03/07/2013	14.90m	191.66m																																								
13/09/2013	14.86m	191.70m																																								
30/09/2013	14.97m	191.59m																																								
Date	Depth	Elevation																																								
24/05/2013	10.02m	196.52m																																								
03/07/2013	10.11m	196.43m																																								
13/09/2013	10.08m	196.46m																																								
30/09/2013	10.08m	196.46m																																								
35																																										
36																																										
37																																										
38																																										
39																																										
40																																										

MIS-TTC-BHS 001_0911116091.GPJ_GAL-MISS.GDT_31/10/13 DATA INPUT:



DEPTH SCALE

1 : 50



LOGGED: RA
CHECKED: RL

PROJECT: 09-1111-6091 (6000)

RECORD OF BOREHOLE: BH 128

SHEET 3 OF 4

LOCATION: N 4856350.3 ; E 626246.0

BORING DATE: May 14, 2013 - May 16, 2013

DATUM: Geodetic

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm



Toronto Transit Commission

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH C_u , kPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100	200	300	400	nat V. -	rem V. -	Q -		U -	Well B Stick-up 0.86m	Well A Stick-up 0.76m	
20	Mud Rotary 75 mm Tricone Bit	--- CONTINUED FROM PREVIOUS PAGE --- Stiff to hard, grey SILTY CLAY, sandy to trace sand, trace to some gravel; TILL (CL)		188.17	17	SS	40	ND											
21		Stiff to hard, grey SILTY CLAY, trace sand, trace gravel, sand seams, silt and fine sand seams at about 26.1m; (CL)		20.88	18	SS	34	ND											
22																			
23																			
24																			
25																			
26																			
27		Very stiff to hard, grey CLAYEY SILT, trace sand, trace gravel; (CL-ML)	182.15	21	SS	82/ 275mm	ND												
28			26.90	22	SS	77	ND												
29																			
30																			
		CONTINUED NEXT PAGE																	

MIS-TTC-BHS 001_0911116091.GPJ_GAL-MISS.GDT_31/10/13 DATA INPUT:

DEPTH SCALE

1 : 50



LOGGED: RA

CHECKED: RL

PROJECT: 09-1111-6091 (6000)

RECORD OF BOREHOLE: BH 128

SHEET 4 OF 4

LOCATION: N 4856350.3 ; E 626246.0

BORING DATE: May 14, 2013 - May 16, 2013

DATUM: Geodetic

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm



Toronto Transit Commission

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH C_u , kPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION Well B Stick-up 0.86m Well A Stick-up 0.76m																								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100	200	300	400	nat V. -	rem V. -			Q -	U -																						
30	Mud Rotary 75 mm Tricone Bit	--- CONTINUED FROM PREVIOUS PAGE --- Very stiff to hard, grey CLAYEY SILT, trace sand, trace gravel; (CL-ML)																																					
31				24	SS	17	ND																																
32			Hard, grey SILTY CLAY, trace sand, silt and sand seam at about 32.2m to 32.3m depth; (CL)	177.50 31.55																																			
33			Hard, grey CLAYEY SILT, trace sand, occasional silt seams; (CL-ML)	175.98 33.07																																			
34					25	SS	83/ 275mm	ND																															
35		Hard, grey SILTY CLAY, trace sand; (CL)	174.46 34.59																																				
36		END OF BOREHOLE	173.41 35.64																																				
37	<p>NOTES:</p> <p>1. A 50 mm diameter deep monitoring well (A) was installed at a depth of 34.75m below ground surface in the completed borehole.</p> <p>2. A 50 mm diameter shallow monitoring well (B) was installed at a depth of 13.26m below ground surface in a new borehole (N 4856348.8; E 626246.1) adjacent to the completed borehole.</p> <p><u>Water level measurements:</u> Monitoring Well A (Ground surface elevation 209.05m)</p> <table border="1"> <tr><th>Date</th><th>Depth</th><th>Elevation</th></tr> <tr><td>03/07/2013</td><td>14.64m</td><td>194.41m</td></tr> <tr><td>13/09/2013</td><td>15.43m</td><td>193.62m</td></tr> <tr><td>30/09/2013</td><td>15.60m</td><td>193.45m</td></tr> </table> <p>Monitoring Well B (Ground surface elevation 208.99m)</p> <table border="1"> <tr><th>Date</th><th>Depth</th><th>Elevation</th></tr> <tr><td>03/07/2013</td><td>7.92m</td><td>201.07m</td></tr> <tr><td>13/09/2013</td><td>8.16m</td><td>200.83m</td></tr> <tr><td>30/09/2013</td><td>8.17m</td><td>200.82m</td></tr> </table>															Date	Depth	Elevation	03/07/2013	14.64m	194.41m	13/09/2013	15.43m	193.62m	30/09/2013	15.60m	193.45m	Date	Depth	Elevation	03/07/2013	7.92m	201.07m	13/09/2013	8.16m	200.83m	30/09/2013	8.17m	200.82m
Date	Depth	Elevation																																					
03/07/2013	14.64m	194.41m																																					
13/09/2013	15.43m	193.62m																																					
30/09/2013	15.60m	193.45m																																					
Date	Depth	Elevation																																					
03/07/2013	7.92m	201.07m																																					
13/09/2013	8.16m	200.83m																																					
30/09/2013	8.17m	200.82m																																					
38																																							
39																																							
40																																							

MIS-TTC-BHS 001_0911116091.GPJ_GAL-MISS.GDT_31/10/13 DATA INPUT:

DEPTH SCALE

1 : 50



LOGGED: RA

CHECKED: RL

PROJECT: 08-1132-0820

RECORD OF BOREHOLE: 14

SHEET 1 OF 4

LOCATION: N 4855722.2 ;E 310462.0

BORING DATE: October 31 & November 3, 2008

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	20	40	60	80	10 ⁻⁸	10 ⁻⁵	10 ⁻⁴		
0		GROUND SURFACE		198.45											
		TOPSOIL		0.00											
		Loose to compact, massive, moist, brown, silty SAND, trace clay, gravel, containing organics; (SM)		0.15											Flush-mounted Protective Casing
1					1	50 DO									
		Stiff, massive, moist, brown, CLAYEY SILT, trace sand and gravel; (CL-ML)		196.93											
				1.52											
2					2	50 DO									
		Compact, massive, moist, brown, sandy SILT, trace clay; (np)		196.16											MH
				2.29											
3					3	50 DO									
					4	50 DO									
4					5	50 DO									MH
					6	50 DO									
5		Loose to compact, massive, moist, brown, SAND, trace to some silt; (SP/SM)		193.88											Grout
				4.57											
6					7	50 DO									MH
		Becoming wet at 6.1 m depth			8	50 DO									
7					9	50 DO									MH
					8	50 DO									
8					9	50 DO									MH
					9	50 DO									
9		Hard, heterogeneous, moist, grey, SILTY CLAY with SAND, trace gravel; TILL (CL)		189.31											
				9.14											
10															

CONTINUED NEXT PAGE

MIS-BHS 001 08-1132-0820.GPJ GAL-MIS.GDT 1/7/09 DD/SAC

DEPTH SCALE

1:50



LOGGED: SB

CHECKED: BLT

PROJECT: 08-1132-0820

RECORD OF BOREHOLE: 14

SHEET 2 OF 4

LOCATION: N 4855722.2 ; E 310462.0

BORING DATE: October 31 & November 3, 2008

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20	40	60	80	10 ⁻⁶	10 ⁻⁵		
10		— CONTINUED FROM PREVIOUS PAGE —													
11		Hard, heterogeneous, moist, grey, SILTY CLAY with SAND, trace gravel; TILL (CL)													Dec 16, 2008
12					10	50 DO	42								MH
13					11	50 DO	51								Grout
14		Very stiff, massive, moist, grey, SILTY CLAY, trace sand; (CL)													
15				185.04											
16		Hard, heterogeneous, moist, grey, CLAYEY SILT with SAND, trace gravel; TILL (CL)													
17				183.21											
18		Very stiff, massive, moist, grey, SILTY CLAY, trace sand; (CL)													
19				180.47											
20				178.64											
20				19.81											
20		CONTINUED NEXT PAGE													

MIS-BHS 001 08-1132-0820.GPJ GAL-MIS.GDT 1/7/09 DD/ISAC

DEPTH SCALE
1 : 50



LOGGED: SB
CHECKED: BLT

PROJECT: 08-1132-0820

RECORD OF BOREHOLE: 14

SHEET 3 OF 4

LOCATION: N 4855722.2 ; E 310462.0

BORING DATE: October 31 & November 3, 2008

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa				WATER CONTENT PERCENT					
								20	40	60	80	nat V. rem V.	+ ⊕	Q - ⊙			U - ○
20	Power Auger 108 mm I.D. Hollow Stem Augers	— CONTINUED FROM PREVIOUS PAGE —															
		Very loose, massive, wet, brown to grey, SAND, some silt; (SP/SM)		16	50 DO	WR										MH	
21				177.11													
		Very dense, massive, wet, grey, SAND and SILT, some gravel, trace clay; (np)		17	50 DO	52/0.15										MH	Sand
22				176.45													
		Compact, massive, wet, grey, SAND, some silt and gravel; (SM)		18	50 DO	24										MH	Screen
23				174.07													
		Very dense, massive, wet, grey, SAND and SILT, trace gravel, trace clay; (np)		19	50 DO	72										MH	
24				172.85													
		Very dense, massive, wet, grey, gravelly SAND to SAND and GRAVEL, some silt, trace clay; (SW)		20	50 DO	110/0.15										MH	Caved Native Material
25	Rotary Drilling Uncased																
				21	50 DO	107/0.15										MH	
26																	
				22	50 DO	52/0.15										MH	Metal Casing
27				168.89													
				29.56													
28		END OF BOREHOLE															
29		NOTES:															
30		CONTINUED NEXT PAGE															

MIS-BHS 001 08-1132-0820.GPJ GAL-MIS.GDT 1/7/09 DD/SAC

DEPTH SCALE
1 : 50



LOGGED: SB
CHECKED: BLT

PROJECT: 08-1132-0820

RECORD OF BOREHOLE: 14

SHEET 4 OF 4

LOCATION: N 4855722.2 ; E 310462.0

BORING DATE: October 31 & November 3, 2008

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION												
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT																
								Cu, kPa		nat V. + Q - rem V. ⊕ U - ○		Wp ----- Wl																
							20	40	60	80	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴	10 ⁻³														
30		— CONTINUED FROM PREVIOUS PAGE —																										
		1. Drill rods were noted to penetrate solely based on weight of hammer from 19.8 m (Elev. 178.6 m) to 20.7 m (Elev. 177.8 m).																										
31		2. Rotary drilling using drilling fluid was carried out from a depth of 24.38 m (Elev. 174.1 m) to the borehole termination depth.																										
		3. Very slow drilling advancement and large volume of water used were noted from a depth of 25.6 m (Elev. 172.9 m) to borehole termination depth																										
32		4. A 3.05 m long metal casing was broken at its threads and left in ground between a depth of 29.59 m (Elev. 168.9 m) and 26.52 m (Elev. 171.9 m) during casing removal.																										
		5. A 50 mm diameter monitoring well was installed at a depth of 22.40 m (Elev. 176.1 m).																										
33		Water level measurements:																										
		<table border="1"> <tr> <th>Date</th> <th>Depth</th> <th>Elev.</th> </tr> <tr> <td>On Completion</td> <td>10.0 m</td> <td>188.5 m</td> </tr> <tr> <td>Dec. 2, 2008</td> <td>9.7 m</td> <td>188.8 m</td> </tr> <tr> <td>Dec. 16, 2008</td> <td>9.96 m</td> <td>188.49 m</td> </tr> </table>															Date	Depth	Elev.	On Completion	10.0 m	188.5 m	Dec. 2, 2008	9.7 m	188.8 m	Dec. 16, 2008	9.96 m	188.49 m
Date	Depth	Elev.																										
On Completion	10.0 m	188.5 m																										
Dec. 2, 2008	9.7 m	188.8 m																										
Dec. 16, 2008	9.96 m	188.49 m																										
34																												
35																												
36																												
37																												
38																												
39																												
40																												

MIS-BHS 001 08-1132-0820.GPJ GAL-MIS.GDT 1/7/09 DD/SAC

DEPTH SCALE
1 : 50



LOGGED: SB
CHECKED: BLT



LOG OF BOREHOLE BH4

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626318.2E, 4856008.1N
 Date Drilled: 7/24/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value
 ▲ Total Organic Volatiles (ppm)

DEPTH (m bgs) (m asl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
							Total Organic Volatiles (ppm)						
							10	20	30	40			
206.37		TOPSOIL											
0.20	206.17	SILTY FINE SAND (FILL) - light brown to light grey - trace of coarse sand and gravel - compact - moist			HS1	PAHs, PHCs	▲	●					
0.76	205.61	- inclusions of gabbro (rock)			HS2	metals	▲						
1.52	204.85	SILTY SAND TILL - dark brown - some clay - trace of gravel, orange mottled - compact - moist			HS3		▲	●					
2.59	203.78	- inclusions of gabbro (rock)			HS4	VOCs, moisture	▲	●					
3.05	203.32	CLAYEY SILT TILL - dark brown - trace of sand and gravel, orange mottled - hard - moist			HS5								
3.81	202.56	- black staining - compact			HS6	soil texture	▲						
4.57	201.8	End of borehole at 4.57 m			HS7	metals	▲	●					
		Notes: 1) Auger refusal occurred at the depth of 0.6 m, therefore the drilling continued in the alternate location - 1 m north of the original location. 2) Borehole was dry upon completion.											

MMM MW REPORT VER.3 YONGESUBWAYBHLOGS.GPJ GINT STD CANADA LAB.GDT 4/2/14



LOG OF BOREHOLE BH5

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626279.6E, 4856181.9N
 Date Drilled: 7/25/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

- SPT (N) Value
- ▲ Total Organic Volatiles (ppm)

DEPTH (m bgs) (masl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
							Total Organic Volatiles (ppm)						
							10	20	30	40			
208.73		TOPSOIL											
0.20	208.53	SILTY FINE SAND (FILL) - light brown to dark brown - pieces of wood, rootlets - trace of gravel - compact - moist			HS1		▲	●					
					HS2	metals	▲	●					
1.37	207.36	CLAYEY SILT, some sand - light brown to grey - trace of gravel - hard - slightly varved texture - moist			HS3	PAHs, PHCs	▲	●					
2.29	206.44	- light brown - trace of sand			HS4		▲	●					
3.05	205.68	SILTY to FINE SAND - light brown to light grey - very soft - moist			HS5		▲	●					
3.66	205.07	CLAYEY SILT TILL - light grey to light brown - trace of sand, orange mottled - soft - varved texture - moist			HS6		▲	●					
3.86	204.87	SILTY CLAY to CLAYEY SILT TILL - light brown - hard - varved texture - light grey - trace of sand - orange mottled			HS7		▲	●					
4.42	204.31	- light grey - trace of sand			HS7b		▲	●					
5.33	203.4	- dark grey - trace of sand			HS8		▲	●					
6.10	202.63				HS9		▲	●					
					HS10	VOCs, moisture	▲	●					
					HS11		▲	●					
7.62	201.11	- dark grey - trace of sand and gravel - saturated			HS12		▲	●					

MMM MW REPORT VER.3 YONGESUBWAYBHLOGS.GPJ GINT STD CANADA LAB.GDT 4/2/14



LOG OF BOREHOLE BH5

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626279.6E, 4856181.9N
 Date Drilled: 7/25/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value

DEPTH (m bgs) (masl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
							Total Organic Volatiles (ppm)						
							10	20	30	40			
200.73													
8.38 200.35	▨	SILTY CLAY to CLAYEY SILT TILL - light brown - hard - varved texture (<i>continued</i>) - pebbles			HS12								
8.99 199.74	▨	End of borehole at 8.99 m Notes: 1) Groundwater was encountered at the depth of 7.6 mbgs upon borehole completion.			HS13	metals	▲	●					



LOG OF BOREHOLE BH6

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626252.5E, 4856328.9N
 Date Drilled: 7/24/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value
 ▲ Total Organic Volatiles (ppm)

DEPTH (m bgs) (masl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
							Total Organic Volatiles (ppm)						
							10	20	30	40			
208.65		TOPSOIL											
0.20	208.45	SILTY CLAY to CLAYEY SILT (FILL) - dark brown - pieces of wood, rootlets - hard - blocky texture - dry			HS1	metals							
0.90	207.75	- moist			HS2								
					HS3								
2.29	206.36	SILTY CLAY to CLAYEY SILT TILL - dark brown, black mottled - some sand and gravel - slight organic odour - hard - slightly varved texture - moist			HS4	VOCs, moisture, TCLP							
3.05	205.6	- orange mottled (signs of oxidation) - varved texture			HS5								
3.81	204.84	- brown to light grey			HS6								
4.11	204.54	CLAYEY SILT, some sand - dark brown, black sand particles - organic odour - hard - very moist			HS7	PHCs							
4.57	204.08	SILTY CLAY TILL - dark brown, orange mottled (signs of oxidation) - hard - moist			HS8	PAHs							
5.18	203.47	End of borehole at 5.18 m											
		Notes: 1) Borehole was dry upon completion.											

MMM MW REPORT VER.3 YONGESUBWAYBHLOGS.GPJ GINT STD CANADA LAB.GDT 4/2/14



LOG OF BOREHOLE MW4

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626299.7E, 4856095.9N
 Date Drilled: 7/25/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value
 ▲ Total Organic Volatiles (ppm)

DEPTH (m bgs) (m asl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
							Total Organic Volatiles (ppm)						
							10	20	30	40			
208.09		TOPSOIL		Bentonite									
0.20	207.89	SILTY FINE SAND (FILL) - light to dark brown, black staining - compact - blocky texture - moist			HS1	VOCs, moisture, PHCs							
0.76	207.33	- dark brown			HS2	metals, soil texture							
1.52	206.57	- orange mottled, black staining			HS3	PAHs							
2.28	205.81	CLAYEY SILT, some sand - trace of gravel - varved texture - moist			HS4								
3.05	205.04	- light brown			HS5								
3.81	204.28	- light brown, orange mottled			HS6	PAHs							
4.04	204.05	SILTY SAND - some clay - orange mottled - moist			HS7								
4.57	203.52	SANDY SILT TILL - light brown, orange mottled - some clay			HS8								
5.33	202.76	- black sand			HS9								
5.48	202.61	- light brown - soft - moist			HS10								
6.10	201.99	CLAYEY SILT to SILTY CLAY TILL - light grey - some sand and gravel - slight organic odour - compact - moist			HS11								
6.86	201.23	- varved texture			HS12								
7.62	200.47	- trace of sand and gravel - hard		Sandpack	HS13								

MMM MW REPORT VER.3 YONGESUBWAYBHLOGS.GPJ GINT STD CANADA LAB.GDT 4/2/14



LOG OF BOREHOLE MW4

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626299.7E, 4856095.9N
 Date Drilled: 7/25/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value

DEPTH (mbgs) (masl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value					
							20	40	60	80		
							Total Organic Volatiles (ppm)					
							10	20	30	40		
200.09		CLAYEY SILT to SILTY CLAY TILL - light grey - some sand and gravel - slight organic odour - compact - moist (continued)			HS13							
8.71 199.38					HS14	metals	▲	●				
8.99 199.1		SANDY SILT, some clay - dark grey - compact - moist - saturated			HS15		▲					
9.14 198.95												
9.75 198.34		End of borehole at 9.75 m					HS16		▲	●		
		Notes: 1) A 50 mm diameter well was installed at the depth of 9.75 mbgs upon borehole completion. 2) Groundwater was encountered at the depth of 9.1 mbgs upon borehole completion.	Water measured on 03/24/2014 200.00 masl 8.99 mbgs Well Diameter: 50 mm Well Material: Schedule 40 PVC									



LOG OF BOREHOLE MW5

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626267.5E, 4856250.5N
 Date Drilled: 7/24/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value
 ▲ Total Organic Volatiles (ppm)

DEPTH (m bgs) (masl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
							Total Organic Volatiles (ppm)						
							10	20	30	40			
208.61		TOPSOIL		Bentonite									
0.20	208.41	SANDY SILT (FILL) - light to dark brown - some gravel - rootlets			HS1								
0.76	207.85	- soft - moist - light brown, fragments of asphalt - hard			HS2	metals							
1.52	207.09	CLAYEY SILT to SILTY TILL			HS3								
1.70	206.91	- dark brown, orange stained - some sand - soft - moist			HS4								
2.29	206.32	- dark brown, some gravel - slightly varved texture - dark brown to dark grey, grey veined - hard			HS5								
3.05	205.56	- very hard			HS6	VOCs, moisture, PAHs							
3.81	204.8				HS7	PAHs							
3.96	204.65	- black mottled, trace of coarse to fine sand, slight organic odour, hard - light brown, grey veined - hard - varved texture - very moist			HS8	PHCs							
4.57	204.04	- some sand, trace gravel - soft			HS9								
5.33	203.28	SILTY CLAY TILL - light to dark brown, grey mottled - signs of oxidation - soft - moist			HS10								
6.10	202.51	- becoming grey - varved texture			HS11								
					HS12								
					HS13								
					HS14								

MMM MW REPORT VER.3 YONGESUBWAYBHLOGS.GPJ GINT STD CANADA LAB.GDT 4/2/14



LOG OF BOREHOLE MW5

Project No. 3277670
 Project: Yonge Subway Extension TPAP
 Location: Richmond Hill, Ontario Co-ordinates: 626267.5E, 4856250.5N
 Date Drilled: 7/24/13 Datum: NAD 83 Zone 17N
 Drill Type: Hollow Stem Augers Logged By: SR
 Drilling Contractor: Walker Drilling Ltd. Checked By: NC

● SPT (N) Value

DEPTH (mbgs) (masl)	SYMBOL	SOIL DESCRIPTION	WELL	INSTALLATION DETAILS	SAMPLE ID	SOIL SAMPLE TEST	Standard Penetration Test N Value						
							20	40	60	80			
200.61					HS14								
8.38 200.23		SILTY CLAY to CLAYEY SILT TILL - dark grey - trace of gravel - hard - moist			HS15	metals	▲	●					
9.14 9.20 199.47 199.41		- dark grey - very moist - varved texture			HS16		▲	●					
9.52 199.09		SAND, some clay - dark grey - saturated		Sandpack	HS17		▲						
					HS18		▲	●					
					HS19		▲	●					
11.28 197.33		End of borehole at 11.28 m											

Notes:
 1) A 50 mm diameter well was installed at the depth of 11.3 mbgs upon borehole completion.
 2) Groundwater was encountered at the depth of 9.3 mbgs upon borehole completion.

Water measured on
 03/24/2014
 200.32 masl
 9.2 mbgs
 Well Diameter:
 50 mm
 Well Material:
 Schedule 40 PVC

Table B1: MOE Water Well Records
Yonge Subway Extension EPR Addendum, Richmond Hill, Ontario

Well ID	Region/Township	Zone	Concession	Lot	Northing	Easting	Screened Formation	Water Type	Date Completed	Water Use	Final Status	Static Water Level (mbgs)	Well Depth (mbgs)	Pumping Rate (L/min)	Pumping Duration (Hr:min)
6902904	York/ Richmond Hill	17	01	037	4855551	626237	Overburden	Fresh	30-Sep-54	Domestic	Water Supply	10.67	27.7	45.46	2:00
6902905	York/ Richmond Hill	17	01	038	4855754	626478	Overburden	No Info	08-May-51	No Info	Test Hole	No Info	56.1	No Info	No Info
6902908	York/ Richmond Hill	17	01	039	4856023	626316	Bedrock	No Info	15-May-51	No Info	Test Hole	No Info	54.6	No Info	No Info
6906180	York/ Richmond Hill	17	01	038	4855674	626436	Overburden	Fresh	04-Apr-52	Domestic	Water Supply	17.07	30.8	18.18	8:00
6931112	York/ Richmond Hill	17	01	No Info	4855812	626517	Overburden	Fresh	05-Dec-06	Not Used	Dewatering	No Info	5	No Info	No Info
7039589	York/ Richmond Hill	17	01	No Info	4855820	626516	Overburden	Fresh	13-Jan-07	Not Used	Dewatering	No Info	5	No Info	No Info
7044663	York/ Richmond Hill	17	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info
7044664	York/ Richmond Hill	17	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info
7152204	York/ Richmond Hill	17	01	No Info	4855399	626133	No Info	No Info	02-Sep-10	Monitoring	Test Hole	No Info	No Info	No Info	No Info
7188283	York/ Richmond Hill	17	01	No Info	4855626	626160	No Info	Untested	11-Jun-12	Test Hole	Test Hole	No Info	10.7	No Info	No Info
7197275	York/ Richmond Hill	17	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info	No Info

mbgs: meter below ground surface

Water Well Records

Well Record

6902904		Lot 037	Conc 01	RICHMOND HILL TOWN (MARKHAM) / YORK			Flowing? N		
Date	9/30/1954	Elev	201.1 (masl)	Easting	626237	Northing	4855551	SWL	10.7 (mbgs) 190.4 (masl)
	DDMMYY		/ Domestic	Water Supply	UTM RC 5 margin of error : 100 m - 300 m			Pumping WL	21.3 (mbgs) 179.8 (masl)
		Water Found	24.4 (mbgs)	176.7 (masl)	FRESH			Pump Rate	45.5 (LPM) 2 / 0
		Casing Material	STEEL	Casing Diameter	4 inch			Spec. Cap.	4.26 (LPM/m) Hr / Min
				Depth (m)	Elev (masl)	Color		Soil Descriptions	
				0.0	201.1				
				0.9	200.2			FILL /	/
				1.5	199.6			TOPSOIL /	/
				7.6	193.5	YELLOW		CLAY /	/
				11.6	189.5	YELLOW		CLAY /	MEDIUM SAND /
				24.4	176.7	BLUE		CLAY /	/
				27.7	173.4	BLUE		MEDIUM SAND /	/

6906180		Lot 038	Conc 01	RICHMOND HILL TOWN (VAUGHAN) / YORK			Flowing? N		
Date	4/4/1952	Elev	201.1 (masl)	Easting	626436	Northing	4855674	SWL	17.1 (mbgs) 184.0 (masl)
	DDMMYY		/ Domestic	Water Supply	UTM RC 9 unknown UTM			Pumping WL	(mbgs) (masl)
		Water Found	29.6 (mbgs)	171.5 (masl)	FRESH			Pump Rate	18.2 (LPM) 8 / 0
		Casing Material	STEEL	Casing Diameter	2 inch			Spec. Cap.	(LPM/m) Hr / Min
				Depth (m)	Elev (masl)	Color		Soil Descriptions	
				0.0	201.1				
				5.5	195.6	BROWN		CLAY /	/
				8.5	192.5			QUICKSAND /	/
				22.9	178.2	BLUE		CLAY /	/
				26.2	174.9			HARDPAN /	GRAVEL /
				29.0	172.1	BLUE		CLAY /	/
				29.6	171.5			HARDPAN /	GRAVEL /
				30.8	170.3			GRAVEL /	/

6931112		Lot	Conc	RICHMOND HILL TOWN (MARKHAM) / YORK			Flowing?		
Date	12/5/2006	Elev	202.1 (masl)	Easting	626517	Northing	4855812	SWL	(mbgs) (masl)
	DDMMYY		/ Not Used	Dewatering	UTM RC 3 margin of error : 10 - 30 m			Pumping WL	(mbgs) (masl)
		Water Found	2.0 (mbgs)	200.1 (masl)	FRESH			Pump Rate	(LPM) /
		Casing Material	PLASTIC	Casing Diameter	2 cm			Spec. Cap.	(LPM/m) Hr / Min
				Depth (m)	Elev (masl)	Color		Soil Descriptions	
				0.0	202.1				
				2.5	199.6	BROWN		SILT /	SANDY / TILL
				5.0	197.1	GREY		SAND /	SANDY / SILT

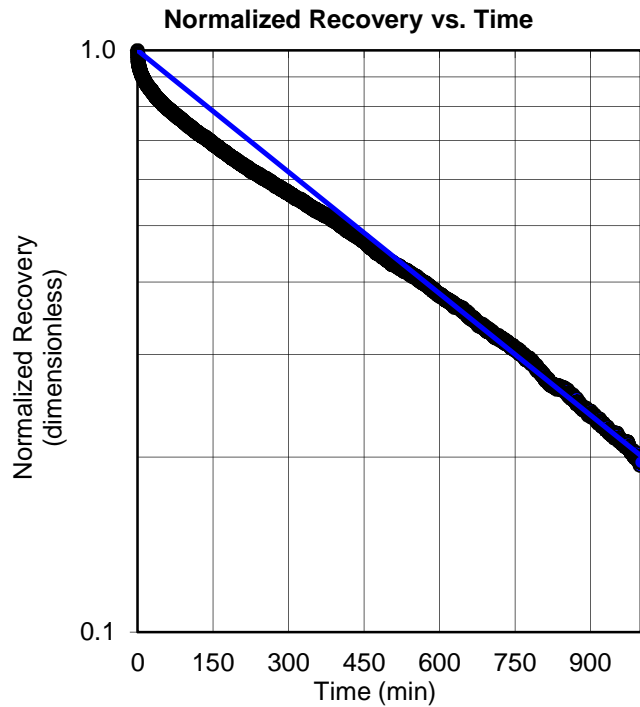
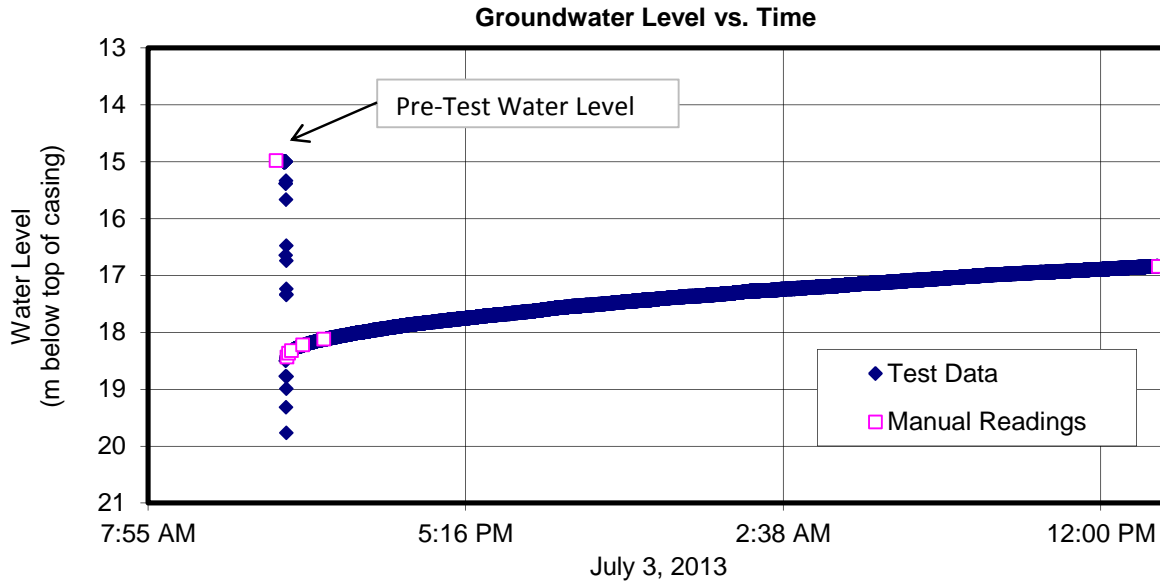
7039589		Lot	Conc	RICHMOND HILL TOWN / YORK			Flowing?		
Date	1/13/2007	Elev	202.2 (masl)	Easting	626516	Northing	4855820	SWL	(mbgs) (masl)
	DDMMYY		/ Not Used	Dewatering	UTM RC 3 margin of error : 10 - 30 m			Pumping WL	(mbgs) (masl)
		Water Found	2.0 (mbgs)	200.2 (masl)	FRESH			Pump Rate	(LPM) /
		Casing Material	PLASTIC	Casing Diameter	2 cm			Spec. Cap.	(LPM/m) Hr / Min
				Depth (m)	Elev (masl)	Color		Soil Descriptions	
				0.0	202.2				
				2.5	199.7	BROWN		SILT /	SANDY / TILL
				5.0	197.2	GREY		SAND /	/

APPENDIX C – Results of Hydraulic Conductivity Testing

In-Situ Hydraulic Conductivity Test Report

Borehole BH126 A

**FIGURE
B1**



Sand Pack Interval (below ground surface)

29.7 m to 33.4 m

Time Lag (T_0) = 620 min

Sand Pack Length (L) = 3.65 m

Well Radius (r) = 0.025 m

Hole Radius (R) = 0.055 m

Soil Type

Sandy Silt

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{(r^2) \ln(L/R)}{2T_0L} = < 1.E-06 \text{ cm/s}$$

DATE: July 2013

PROJECT: 09-1111-6091



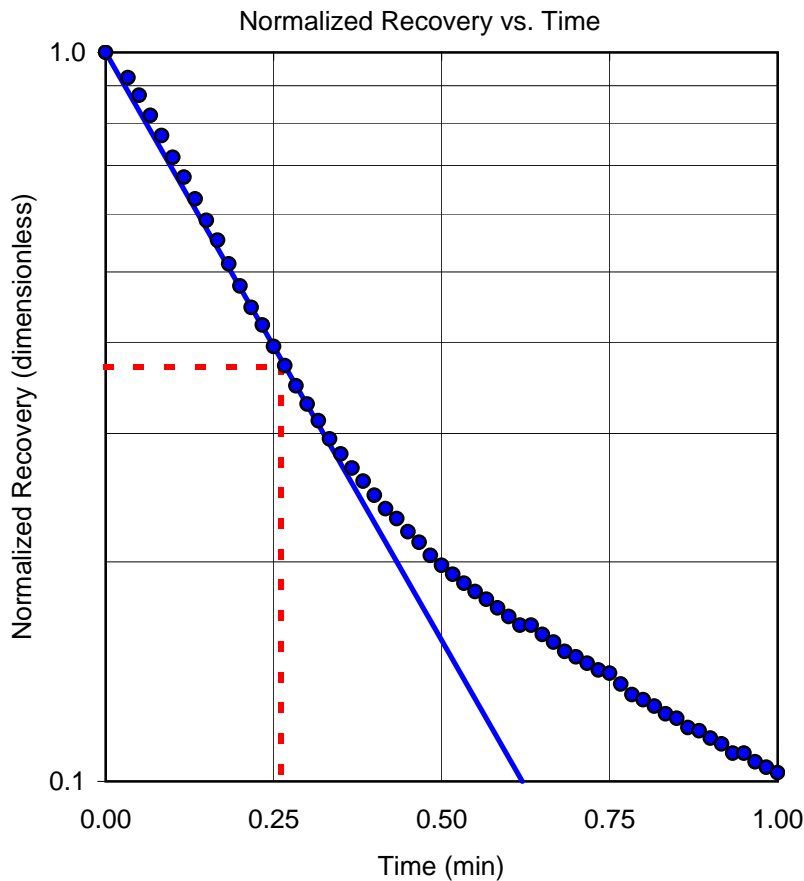
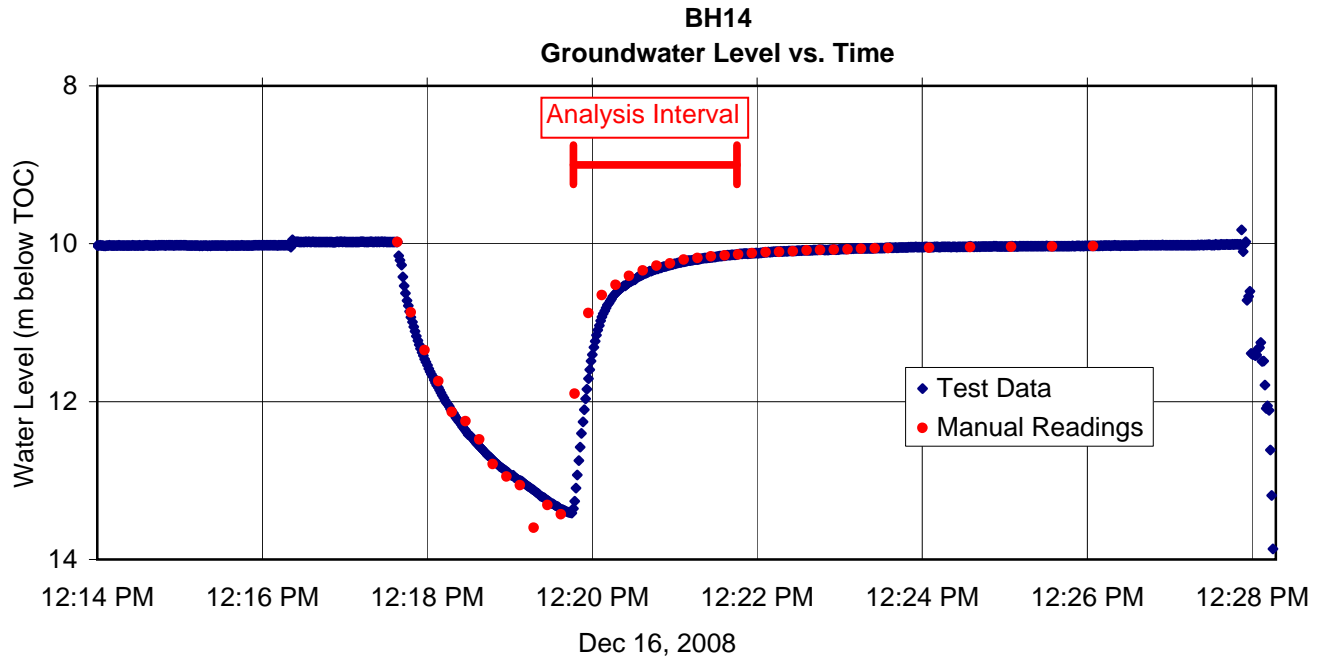
DESIGN: JB

CHECK: SMD

In Situ Hydraulic Conductivity Test Report of BH14

Yonge Subway Extension

FIGURE B9



Screened Interval
154.22 to 149.97 masl
Sandy Silt to Sand and Silt

Time Lag (T_0) = 0.3 min
Screen Length (L) = 5.19 m
Well Radius (r) = 0.0254 m
Hole Radius (R) = 0.076 m

Hvorslev Analysis
$$K = \frac{(r^2) \ln(L/r)}{2T_0L} = 2 \times 10^{-3} \text{ cm/s}$$

DATE: January 2009

PROJECT: 08-1132-0820



prepared by: KR

CHK: SMD

APPENDIX D – Certificate of Analysis for Groundwater Samples

**TABLE D-1: Summary of Analytical Results
Inorganics and Dissolved Metals in Groundwater
Yonge Subway Extension EPR Addendum**

Sample ID Well Screen (mbgs) Job # Sampling Date	Criteria for Sanitary Sewer Discharge	Criteria for Storm Sewer Discharge	Reporting Limit	Units	BH128A	BH126B
					10.2-13.2	11.3-14.3
					TF2054	TF2055
					25-Sep-13	25-Sep-13
Aluminum (Dissolved)	50000	NV	5.0	ug/L	98	41
Antimony (Dissolved)	5000	NV	0.50	ug/L	0.77	<0.50
Arsenic (Dissolved)	1000	20	1.0	ug/L	10	<1.0
Barium (Dissolved)	NV	NV	2.0	ug/L	96	96
Beryllium (Dissolved)	NV	NV	0.50	ug/L	<0.50	<0.50
Boron (Dissolved)	NV	NV	10	ug/L	170	50
Cadmium (Dissolved)	700	8	0.10	ug/L	<0.10	<0.10
Calcium (Dissolved)	NV	NV	200	ug/L	24000	94000
Chloride (Dissolved)	NV	NV	1000	ug/L	10	120
Chromium (Dissolved)	2000	80	5.0	ug/L	<5.0	<5.0
Cobalt (Dissolved)	5000	NV	0.50	ug/L	9.3	1.5
Copper (Dissolved)	3000	50	1.0	ug/L	<1.0	<1.0
Iron (Dissolved)	NV	NV	100	ug/L	<100	<100
Lead (Dissolved)	1000	120	0.50	ug/L	<0.50	<0.50
Magnesium (Dissolved)	NV	NV	50	ug/L	13000	16000
Manganese(Dissolved)	5000	150	2.0	ug/L	40	27
Molybdenum (Dissolved)	5000	NV	0.50	ug/L	8.7	1.3
Nickel (Dissolved)	2000	80	1.0	ug/L	1.9	<1.0
Phosphorus (Dissolved)	10000	400	100	ug/L	<100	<100
Potassium (Dissolved)	NV	NV	200	ug/L	1300	1700
Selenium (Dissolved)	1000	20	2.0	ug/L	<2.0	<2.0
Silicon (Dissolved)	NV	NV	50	ug/L	6600	5900
Silver (Dissolved)	5000	120	0.10	ug/L	0.17	0.19
Sodium (Dissolved)	NV	NV	100	ug/L	38000	72000
Strontium (Dissolved)	NV	NV	1.0	ug/L	410	220
Thallium (Dissolved)	NV	NV	0.050	ug/L	<0.050	<0.050
Titanium (Dissolved)	5000	NV	5.0	ug/L	5.5	<5.0
Uranium (Dissolved)	NV	NV	0.10	ug/L	1.9	1.2
Vanadium (Dissolved)	NV	NV	0.50	ug/L	3.9	1.2
Zinc (Dissolved)	2000	40	5.0	ug/L	<5.0	<5.0
Total Ammonia	NV	NV	50	ug/L	0.93	0.16
Conductivity	NV	NV	1.0	umho/cm	390	970
Dissolved Organic Carbon	NV	NV	200	ug/L	2.2	1.1
Orthophosphate	NV	NV	10	ug/L	0.013	<0.010
pH	6.0 to 9.0	NV	NV	ug/L	8.19	8.04
Sulphate (Dissolved)	NV	NV	1000	ug/L	8	110
Alkalinity (total as CaCO3)	NV	NV	1000	ug/L	180	190
Nitrite	NV	NV	10	ug/L	<0.010	<0.010
Nitrate	NV	NV	100	ug/L	<0.10	0.83
Nitrate+Nitrite	NV	NV	100	ug/L	<0.10	0.83

Notes:

NM = Not Measured; NV = No Value

Criteria Used: The Regional Municipality of York, Bill no. 56, Bylaw No. 2011-56: Discharge of Sewage, Storm Water and Land Drainage Bylaw (2011). Table 1 "Limits for Sanitary Sewer Discharge", AND Table 2 "Limits for Storm Sewer Discharge".

10	Exceeds Table 1 - Sanitary Sewer Discharge Limits
10	Exceeds Table 2 - Storm Sewer Discharge Limits
10	Exceeds Table 1 - Sanitary Sewers Discharge AND Table 2 - Storm Sewer Discharge Limits

**TABLE D-2: Summary of Analytical Results
Inorganics and Total Metals in Groundwater
Yonge Subway Extension EPR Addendum**

Sample ID Well Screen (mbgs) Job # Sampling Date	Criteria for Sanitary Sewer Discharge	Criteria for Storm Sewer Discharge	Reporting Limit	Units	BH126B
					11.3-14.3
					TH2108
					30-Sep-13
pH	6.0 to 9.0	NV	NV	pH	7.99
Biochemical Oxygen Demand	300000	15000	2000	ug/L	<2000
Cyanide (Total)	2000	NV	5	ug/L	<5.0
Fluoride	10000	NV	100	ug/L	210.00
Total Kjeldahl Nitrogen (TKN)	100000	1000	100	ug/L	370.00
Oil and Grease - Animal and Vegetable	150000	NV	500	ug/L	<500
Oil and Grease - Mineral and Synthetic	15000	NV	500	ug/L	<500
Phenolics (4AAP)	1000	8	1	ug/L	<1.0
Total Suspended Solids	350000	15000	10000	ug/L	170000
Nonylphenol (Total)	20	NV	1	ug/L	<1
Nonylphenol Ethoxylate (Total)	200	NV	5	ug/L	<5
Oil and Grease (Total)	-	NV	500	ug/L	<0.50
Aluminum (Total)	50000	NV	5.0	ug/L	1800
Antimony (Total)	5000	NV	0.50	ug/L	<0.50
Arsenic (Total)	1000	20	1.0	ug/L	<1.0
Cadmium (Total)	700	8	0.10	ug/L	<0.10
Chromium (Total)	2000	80	5.0	ug/L	<5.0
Chromium VI	2000	NV	0.50	ug/L	0.75
Cobalt (Total)	5000	NV	0.50	ug/L	1.1
Copper (Total)	3000	50	1.0	ug/L	3.7
Lead (Total)	1000	120	0.50	ug/L	1.4
Manganese(Total)	5000	150	2.0	ug/L	71
Mercury	10	0.4	0.10	ug/L	<0.10
Molybdenum (Total)	5000	NV	0.50	ug/L	1.2
Nickel (Total)	2000	80	1.0	ug/L	2.7
Phosphorus (Total)	10000	400	100	ug/L	110
Selenium (Total)	1000	20	2.0	ug/L	<2.0
Silver (Total)	5000	120	0.10	ug/L	<0.10
Tin (Total)	5000	NV	1.0	ug/L	2.4
Titanium (Total)	5000	NV	5.0	ug/L	98
Zinc (Total)	2000	40	5.0	ug/L	10

Notes:

NM = Not Measured

NV = No Value

Criteria Used: The Regional Municipality of York, Bill no. 56, Bylaw No. 2011-56: Discharge of Sewage, Storm Water and Land Drainage Bylaw (2011). Table 1 "Limits for Sanitary Sewer Discharge", AND Table 2 "Limits for Storm Sewer Discharge".

10	Exceeds Table 1 - Sanitary Sewers Discharge Limits
10	Exceeds Table 2 - Storm Sewer Discharge Limits
10	Exceeds Table 1 - Sanitary Sewers Discharge AND Table 2 - Storm Sewer Discharge Limits

**TABLE D-3: Summary of Analytical Results
Polycyclic Aromatic Hydrocarbons in Groundwater
Yonge Subway Extension EPR Addendum**

Sample ID Well Screen (mbgs) Job # Sampling Date	Criteria for Sanitary Sewer Discharge	Criteria for Storm Sewer Discharge	Reporting limit	Units	BH126B
					11.3-14.3
					TH2108
					30-Sep-13
Anthracene	NV	NV	0.2	ug/L	<0.2
Benzo[a]anthracene	NV	NV	0.2	ug/L	<0.2
Benzo[a]pyrene	NV	NV	0.2	ug/L	<0.2
Benzo[b]fluoranthene	NV	NV	0.2	ug/L	<0.2
Benzo[e]pyrene	NV	NV	0.2	ug/L	<0.2
Benzo[g,h,i]perylene	NV	NV	0.2	ug/L	<0.2
Benzo[k]fluoranthene	NV	NV	0.2	ug/L	<0.2
Bis[2-ethylhexyl]phthalate	12	8.8	2	ug/L	<2
Chrysene	NV	NV	0.2	ug/L	<0.2
Dibenz[a,h]anthracene	NV	NV	0.2	ug/L	<0.2
Dibenzo[a,i]pyrene	NV	NV	0.2	ug/L	<0.2
Dibenzo[a,j] acridine	NV	NV	0.4	ug/L	<0.4
7H-Dibenzo[c,g] Carbazole	NV	NV	0.4	ug/L	<0.4
Di-N-butyl phthalate	80	15.0	2	ug/L	<2
1,3-Dinitropyrene	NV	NV	0.4	ug/L	<0.4
1,6-Dinitropyrene	NV	NV	0.4	ug/L	<0.4
1,8-Dinitropyrene	NV	NV	0.4	ug/L	<0.4
3,3'-Dichlorobenzidine	NV	NV	0.8	ug/L	<0.8
Fluoranthene	NV	NV	0.2	ug/L	<0.2
Indeno[1,2,3-cd]pyrene	NV	NV	0.2	ug/L	<0.2
Pentachlorophenol	NV	NV	1	ug/L	<1
Perylene	NV	NV	0.2	ug/L	<0.2
Phenanthrene	NV	NV	0.2	ug/L	<0.2
Pyrene	NV	NV	0.2	ug/L	<0.2
Total PAHs	NV	NV	1	ug/L	<1

Notes:

NM = Not Measured

NV = No Value

Criteria Used: The Regional Municipality of York, Bill no. 56, Bylaw No. 2011-56: Discharge of Sewage, Storm Water and Land Drainage Bylaw (2011). Table 1 "Limits for Sanitary Sewer Discharge", AND Table 2 "Limits for Storm Sewer Discharge".

10	Exceeds Table 1 - Sanitary Sewer Discharge Limits
10	Exceeds Table 2 - Storm Sewer Discharge Limits
10	Exceeds Table 1 - Sanitary Sewer Discharge AND Table 2 - Storm Sewer Discharge Limits

**TABLE D-4: Summary of Analytical Results
Volatile Organic Compounds and Petroleum Hydrocarbons in Groundwater
Yonge Subway Extension EPR Addendum**

Sample ID Well Screen (mbgs) Job # Sampling Date	Criteria for Sanitary Sewer Discharge	Criteria for Storm Sewer Discharge	Reporting Limit	Units	BH126B
					11.3-14.3
					TH2108/TH4403
					30-Sep-13
Benzene	10	2.0	0.10	ug/L	<0.10
Chloroform	40	2.0	0.10	ug/L	<0.10
Dichlorobenzene, 1,2-	50	5.6	0.20	ug/L	<0.20
Dichlorobenzene, 1,4-	80	6.8	0.20	ug/L	<0.20
Dichloroethylene, 1, 2-cis-	4000	5.6	0.10	ug/L	<0.10
trans-1,3-Dichloropropene	140	5.6	0.20	ug/L	<0.20
Ethylbenzene	160	2.0	0.10	ug/L	<0.10
Methylene Chloride	2000	5.2	0.50	ug/L	<0.50
Tetrachloroethane, 1,1,2,2-	1400	17.0	0.20	ug/L	<0.20
Tetrachloroethylene	1000	4.4	0.10	ug/L	<0.10
Toluene	270	2.0	0.20	ug/L	<0.20
Trichloroethylene	400	8.0	0.10	ug/L	<0.10
m-Xylene & p-Xylene	NV	NV	0.10	ug/L	<0.10
o-Xylene	NV	NV	0.10	ug/L	<0.10
Total Xylenes	1400	4.4	0.10	ug/L	<0.10
F1 (C6-C10)	NV	NV	25	ug/L	<25
F1 (C6-C10) - BTEX	NV	NV	25	ug/L	<25
F2 (C10-C16 Hydrocarbons)	NV	NV	100	ug/L	<100
F3 (C16-C34 Hydrocarbons)	NV	NV	200	ug/L	<200
F4 (C34-C50 Hydrocarbons)	NV	NV	200	ug/L	<200
Reached Baseline at C50					YES

Notes:

NM = Not Measured

NV = No Value

Criteria Used: The Regional Municipality of York, Bill no. 56, Bylaw No. 2011-56: Discharge of Sewage, Storm Water and Land Drainage Bylaw (2011). Table 1 "Limits for Sanitary Sewer Discharge", AND Table 2 "Limits for Storm Sewer Discharge".

10	Exceeds Table 1 - Sanitary Sewer Discharge Limits
10	Exceeds Table 2 - Storm Sewer Discharge Limits
10	Exceeds Table 1 - Sanitary Sewer Discharge AND Table 2 - Storm Sewer Discharge Limits

**TABLE D-5: Summary of Analytical Results
Organochlorides and Polychlorinated Biphenyls in Groundwater
Yonge Subway Extension EPR Addendum**

Borehole ID Well Screen (mbgs) Maxxam work order Sampling Date	Criteria for Sanitary Sewers Discharge	Criteria for Storm Sewer Discharge	Reporting limit	Units	BH126B
					11.3-14.3
					TH2108/TH4403
					30-Sep-13
Aldrin + Dieldrin	NV	NV	0.005	ug/L	<0.005
Aldrin	NV	NV	0.005	ug/L	<0.005
Dieldrin	NV	NV	0.005	ug/L	<0.005
Chlordane (Total)	NV	NV	0.005	ug/L	<0.005
a-Chlordane	NV	NV	0.005	ug/L	<0.005
g-Chlordane	NV	NV	0.005	ug/L	<0.005
o,p-DDT + p,p-DDT	NV	NV	0.005	ug/L	<0.005
o,p-DDT	NV	NV	0.005	ug/L	<0.005
p,p-DDT	NV	NV	0.005	ug/L	<0.005
Hexachlorobenzene	NV	NV	0.005	ug/L	<0.005
Lindane	NV	NV	0.003	ug/L	<0.003
Mirex	NV	NV	0.005	ug/L	<0.005
Aroclor 1242	NV	NV	0.05	ug/L	<0.05
Aroclor 1248	NV	NV	0.05	ug/L	<0.05
Aroclor 1254	NV	NV	0.05	ug/L	<0.05
Aroclor 1260	NV	NV	0.05	ug/L	<0.05
Total PCB	1	0.4	0.05	ug/L	<0.05

Notes:

NM = Not Measured

NV = No Value

Criteria Used: The Regional Municipality of York, Bill no. 56, Bylaw No. 2011-56: Discharge of Sewage, Storm Water and Land Drainage Bylaw (2011). Table 1 "Limits for Sanitary Sewer Discharge", AND Table 2 "Limits for Storm Sewer Discharge".

10	Exceeds Table 1 - Sanitary Sewer Discharge Limits
10	Exceeds Table 2 - Storm Sewer Discharge Limits
10	Exceeds Table 1 - Sanitary Sewer Discharge AND Table 2 - Storm Sewer Discharge Limits

**TABLE D-6: Summary of Analytical Results
Microbiological Parameters in Groundwater
Yonge Subway Extension EPR Addendum**

Borehole ID Well Screen (mbgs) Maxxam work order Sampling Date	Criteria for Sanitary and Combined Sewers Discharge	Criteria for Storm Sewer Discharge	Reporting limit	Units	BH126B
					11.3-14.3
					TH2108
					30-Sep-13
Escherichia coli	NV	NV	10	CFU/100mL	180

Notes:

NM = Not Measured
NV = No Value

Criteria Used: The Regional Municipality of York, Bill no. 56, Bylaw No. 2011-56: Discharge of Sewage, Storm Water and Land Drainage Bylaw (2011). Table 1 "Limits for Sanitary Sewer Discharge", AND Table 2 "Limits for Storm Sewer Discharge".

10	Exceeds Table 1 - Sanitary Sewer Discharge Limits
<u>10</u>	Exceeds Table 2 - Storm Sewer Discharge Limits
<u>10</u>	Exceeds Table 1 - Sanitary Sewer Discharge AND Table 2 - Storm Sewer Discharge Limits

Your Project #: 09-1111-6091
 Site#: 09-1111-6091
 Your C.O.C. #: 43784401, 437844-01-01

Attention: Reza Lackpour

Golder Associates Ltd
 140 Renfrew Dr
 Suite 110
 Markham, ON
 L3R 6B3

Report Date: 2013/10/02

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G2546

Received: 2013/09/25, 12:25

Sample Matrix: Water
 # Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	2	N/A	2013/09/27	CAM SOP-00448	SM 2320B
Carbonate, Bicarbonate and Hydroxide	1	N/A	2013/09/27	CAM SOP-00102	APHA 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	1	N/A	2013/09/30	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2013/09/27	CAM SOP-00463	EPA 325.2
Conductivity	2	N/A	2013/09/27	CAM SOP-00414	SM 2510
Dissolved Organic Carbon (DOC)	2	N/A	2013/09/26	CAM SOP-00446	SM 5310 B
Hardness (calculated as CaCO3)	2	N/A	2013/10/02	CAM SOP 00102	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2013/10/01	CAM SOP-00447	EPA 6020
Ion Balance (% Difference)	2	N/A	2013/10/02		
Anion and Cation Sum	2	N/A	2013/10/02		
Total Ammonia-N	2	N/A	2013/10/02	CAM SOP-00441	US GS I-2522-90
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2013/09/27	CAM SOP-00440	SM 4500 NO3/NO2B
pH	2	N/A	2013/09/27	CAM SOP-00413	SM 4500H+ B
Orthophosphate	2	N/A	2013/09/27	CAM SOP-00461	EPA 365.1
Sat. pH and Langelier Index (@ 20C)	2	N/A	2013/10/02		
Sat. pH and Langelier Index (@ 4C)	2	N/A	2013/10/02		
Sulphate by Automated Colourimetry	2	N/A	2013/09/27	CAM SOP-00464	EPA 375.4
Total Dissolved Solids (TDS calc)	2	N/A	2013/10/02		

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

* Results relate only to the items tested.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Antonella Brasil, Project Manager
 Email: ABrasil@maxxam.ca
 Phone# (905) 817-5817

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

Total cover pages: 1

Maxxam Job #: B3G2546
 Report Date: 2013/10/02

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: JB

RESULTS OF ANALYSES OF WATER

Maxxam ID		TF2054		TF2055		
Sampling Date		2013/09/25 09:30		2013/09/25 10:30		
	Units	BH128A	QC Batch	BH126B	RDL	QC Batch
Calculated Parameters						
Anion Sum	me/L	4.11	3361956	9.44	N/A	3361956
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	180	3363338	190	1.0	3363338
Calculated TDS	mg/L	220	3361959	540	1.0	3361959
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	2.6	3363338	1.9	1.0	3363338
Cation Sum	me/L	4.01	3361956	9.21	N/A	3361956
Hardness (CaCO ₃)	mg/L	110	3362918	300	1.0	3362918
Ion Balance (% Difference)	%	1.26	3361955	1.26	N/A	3361955
Langelier Index (@ 20C)	N/A	0.437	3361957	0.819		3361957
Langelier Index (@ 4C)	N/A	0.187	3361958	0.571		3361958
Saturation pH (@ 20C)	N/A	7.75	3361957	7.22		3361957
Saturation pH (@ 4C)	N/A	8.00	3361958	7.47		3361958
Inorganics						
Total Ammonia-N	mg/L	0.93	3366236	0.16	0.050	3366236
Conductivity	umho/cm	390	3365238	970	1.0	3364341
Dissolved Organic Carbon	mg/L	2.2	3364536	1.1	0.20	3364162
Orthophosphate (P)	mg/L	0.013	3365249	<0.010	0.010	3365249
pH	pH	8.19	3365239	8.04		3364340
Dissolved Sulphate (SO ₄)	mg/L	8	3365250	110	1	3365250
Alkalinity (Total as CaCO ₃)	mg/L	180	3365237	190	1.0	3364335
Dissolved Chloride (Cl)	mg/L	10	3365248	120	1	3365248
Nitrite (N)	mg/L	<0.010	3365230	<0.010	0.010	3365728
Nitrate (N)	mg/L	<0.10	3365230	0.83	0.10	3365728
Nitrate + Nitrite	mg/L	<0.10	3365230	0.83	0.10	3365728

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

Maxxam Job #: B3G2546
 Report Date: 2013/10/02

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: JB

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		TF2054	TF2055		
Sampling Date		2013/09/25 09:30	2013/09/25 10:30		
	Units	BH128A	BH126B	RDL	QC Batch
Metals					
Dissolved Aluminum (Al)	ug/L	98	41	5.0	3369883
Dissolved Antimony (Sb)	ug/L	0.77	<0.50	0.50	3369883
Dissolved Arsenic (As)	ug/L	10	<1.0	1.0	3369883
Dissolved Barium (Ba)	ug/L	96	96	2.0	3369883
Dissolved Beryllium (Be)	ug/L	<0.50	<0.50	0.50	3369883
Dissolved Boron (B)	ug/L	170	50	10	3369883
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	0.10	3369883
Dissolved Calcium (Ca)	ug/L	24000	94000	200	3369883
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	5.0	3369883
Dissolved Cobalt (Co)	ug/L	9.3	1.5	0.50	3369883
Dissolved Copper (Cu)	ug/L	<1.0	<1.0	1.0	3369883
Dissolved Iron (Fe)	ug/L	<100	<100	100	3369883
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	3369883
Dissolved Magnesium (Mg)	ug/L	13000	16000	50	3369883
Dissolved Manganese (Mn)	ug/L	40	27	2.0	3369883
Dissolved Molybdenum (Mo)	ug/L	8.7	1.3	0.50	3369883
Dissolved Nickel (Ni)	ug/L	1.9	<1.0	1.0	3369883
Dissolved Phosphorus (P)	ug/L	<100	<100	100	3369883
Dissolved Potassium (K)	ug/L	1300	1700	200	3369883
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	2.0	3369883
Dissolved Silicon (Si)	ug/L	6600	5900	50	3369883
Dissolved Silver (Ag)	ug/L	0.17	0.19	0.10	3369883
Dissolved Sodium (Na)	ug/L	38000	72000	100	3369883
Dissolved Strontium (Sr)	ug/L	410	220	1.0	3369883
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	0.050	3369883
Dissolved Titanium (Ti)	ug/L	5.5	<5.0	5.0	3369883
Dissolved Uranium (U)	ug/L	1.9	1.2	0.10	3369883
Dissolved Vanadium (V)	ug/L	3.9	1.2	0.50	3369883
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	5.0	3369883

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Maxxam Job #: B3G2546
Report Date: 2013/10/02

Golder Associates Ltd
Client Project #: 09-1111-6091

Sampler Initials: JB

Test Summary

Maxxam ID TF2054
Sample ID BH128A
Matrix Water

Collected 2013/09/25
Shipped
Received 2013/09/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	3365237	N/A	2013/09/27	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	3363338	N/A	2013/09/30	Automated Statchk
Chloride by Automated Colourimetry	AC	3365248	N/A	2013/09/27	Alina Dobreanu
Conductivity	COND	3365238	N/A	2013/09/27	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	3364536	N/A	2013/09/26	Anastasia Hamanov
Hardness (calculated as CaCO ₃)		3362918	N/A	2013/10/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	3369883	N/A	2013/10/01	Prempal Bhatti
Ion Balance (% Difference)	CALC	3361955	N/A	2013/10/02	Automated Statchk
Anion and Cation Sum	CALC	3361956	N/A	2013/10/02	Automated Statchk
Total Ammonia-N	LACH/NH ₄	3366236	N/A	2013/10/02	Anastasia Hamanov
Nitrate (NO ₃) and Nitrite (NO ₂) in Water	LACH	3365230	N/A	2013/09/27	Sandeep Singh
pH	PH	3365239	N/A	2013/09/27	Surinder Rai
Orthophosphate	AC	3365249	N/A	2013/09/27	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	3361957	N/A	2013/10/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	3361958	N/A	2013/10/02	Automated Statchk
Sulphate by Automated Colourimetry	AC	3365250	N/A	2013/09/27	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	3361959	N/A	2013/10/02	Automated Statchk

Maxxam ID TF2055
Sample ID BH126B
Matrix Water

Collected 2013/09/25
Shipped
Received 2013/09/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	3364335	N/A	2013/09/27	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	3363338	N/A	2013/09/27	Automated Statchk
Chloride by Automated Colourimetry	AC	3365248	N/A	2013/09/27	Alina Dobreanu
Conductivity	COND	3364341	N/A	2013/09/27	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	3364162	N/A	2013/09/26	Anastasia Hamanov
Hardness (calculated as CaCO ₃)		3362918	N/A	2013/10/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	3369883	N/A	2013/10/01	Prempal Bhatti
Ion Balance (% Difference)	CALC	3361955	N/A	2013/10/02	Automated Statchk
Anion and Cation Sum	CALC	3361956	N/A	2013/10/02	Automated Statchk
Total Ammonia-N	LACH/NH ₄	3366236	N/A	2013/10/02	Anastasia Hamanov

Maxxam Job #: B3G2546
 Report Date: 2013/10/02

Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: JB

Test Summary

Nitrate (NO3) and Nitrite (NO2) in Water	LACH	3365728	N/A	2013/09/27	Sandeep Singh
pH	PH	3364340	N/A	2013/09/27	Surinder Rai
Orthophosphate	AC	3365249	N/A	2013/09/27	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	3361957	N/A	2013/10/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	3361958	N/A	2013/10/02	Automated Statchk
Sulphate by Automated Colourimetry	AC	3365250	N/A	2013/09/27	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	3361959	N/A	2013/10/02	Automated Statchk

Maxxam Job #: B3G2546
Report Date: 2013/10/02

Golder Associates Ltd
Client Project #: 09-1111-6091

Sampler Initials: JB

Package 1	6.3°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Sample TF2054-01: DOC and Ammonia: Sample(s) were submitted with sediment levels >1cm. Analysis performed with client's consent.

Sample TF2055-01: DOC, Ammonia, Alkalinity, Chloride, Conductivity, Nitrite/Nitrate, pH, Phosphate, Sulphate: Sample(s) were submitted with sediment levels >1cm. Analysis performed with client's consent.

Maxxam Job #: B3G2546
 Report Date: 2013/10/02

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: JB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3364162	Dissolved Organic Carbon	2013/09/26	102	80 - 120	101	80 - 120	<0.20	mg/L	NC	20		
3364335	Alkalinity (Total as CaCO3)	2013/09/27					<1.0	mg/L	1.1	25	94	85 - 115
3364341	Conductivity	2013/09/27			101	85 - 115	<1.0	umho/cm	0.1	25		
3364536	Dissolved Organic Carbon	2013/09/26	101	80 - 120	100	80 - 120	<0.20	mg/L	NC	20		
3365230	Nitrite (N)	2013/09/27	101	80 - 120	99	85 - 115	<0.010	mg/L	NC	25		
3365230	Nitrate (N)	2013/09/27	NC	80 - 120	98	85 - 115	<0.10	mg/L	4.0	25		
3365237	Alkalinity (Total as CaCO3)	2013/09/27					<1.0	mg/L	0.9	25	96	85 - 115
3365238	Conductivity	2013/09/27			101	85 - 115	<1.0	umho/cm	0.3	25		
3365248	Dissolved Chloride (Cl)	2013/09/27	NC	80 - 120	103	80 - 120	<1	mg/L	0.2	20		
3365249	Orthophosphate (P)	2013/09/27	111	75 - 125	98	80 - 120	<0.010	mg/L	NC	25		
3365250	Dissolved Sulphate (SO4)	2013/09/27	NC	75 - 125	103	80 - 120	<1	mg/L	0.2	20		
3365728	Nitrite (N)	2013/09/27	101	80 - 120	104	85 - 115	<0.010	mg/L	NC	25		
3365728	Nitrate (N)	2013/09/27	102	80 - 120	105	85 - 115	<0.10	mg/L	NC	25		
3366236	Total Ammonia-N	2013/10/02	104	80 - 120	104	85 - 115	<0.050	mg/L	NC	20		
3369883	Dissolved Aluminum (Al)	2013/10/01	106	80 - 120	99	80 - 120	<5.0	ug/L				
3369883	Dissolved Antimony (Sb)	2013/10/01	109	80 - 120	98	80 - 120	<0.50	ug/L				
3369883	Dissolved Arsenic (As)	2013/10/01	103	80 - 120	96	80 - 120	<1.0	ug/L				
3369883	Dissolved Barium (Ba)	2013/10/01	NC	80 - 120	98	80 - 120	<2.0	ug/L				
3369883	Dissolved Beryllium (Be)	2013/10/01	105	80 - 120	101	80 - 120	<0.50	ug/L				
3369883	Dissolved Boron (B)	2013/10/01	106	80 - 120	105	80 - 120	<10	ug/L				
3369883	Dissolved Cadmium (Cd)	2013/10/01	103	80 - 120	99	80 - 120	<0.10	ug/L				
3369883	Dissolved Calcium (Ca)	2013/10/01	NC	80 - 120	98	80 - 120	<200	ug/L				
3369883	Dissolved Chromium (Cr)	2013/10/01	101	80 - 120	96	80 - 120	<5.0	ug/L				
3369883	Dissolved Cobalt (Co)	2013/10/01	99	80 - 120	96	80 - 120	<0.50	ug/L				
3369883	Dissolved Copper (Cu)	2013/10/01	92	80 - 120	96	80 - 120	<1.0	ug/L				
3369883	Dissolved Iron (Fe)	2013/10/01	98	80 - 120	95	80 - 120	<100	ug/L				
3369883	Dissolved Lead (Pb)	2013/10/01	95	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
3369883	Dissolved Magnesium (Mg)	2013/10/01	NC	80 - 120	98	80 - 120	77, RDL=50	ug/L				
3369883	Dissolved Manganese (Mn)	2013/10/01	NC	80 - 120	98	80 - 120	<2.0	ug/L				
3369883	Dissolved Molybdenum (Mo)	2013/10/01	110	80 - 120	97	80 - 120	<0.50	ug/L				
3369883	Dissolved Nickel (Ni)	2013/10/01	94	80 - 120	95	80 - 120	<1.0	ug/L				
3369883	Dissolved Phosphorus (P)	2013/10/01	104	80 - 120	95	80 - 120	<100	ug/L				
3369883	Dissolved Potassium (K)	2013/10/01	104	80 - 120	97	80 - 120	<200	ug/L				
3369883	Dissolved Selenium (Se)	2013/10/01	87	80 - 120	98	80 - 120	<2.0	ug/L				
3369883	Dissolved Silicon (Si)	2013/10/01	NC	80 - 120	98	80 - 120	<50	ug/L				
3369883	Dissolved Silver (Ag)	2013/10/01	72 ₍₁₎	80 - 120	95	80 - 120	0.11, RDL=0.10	ug/L				
3369883	Dissolved Sodium (Na)	2013/10/01	NC	80 - 120	99	80 - 120	<100	ug/L				
3369883	Dissolved Strontium (Sr)	2013/10/01	NC	80 - 120	99	80 - 120	<1.0	ug/L				
3369883	Dissolved Thallium (Tl)	2013/10/01	95	80 - 120	98	80 - 120	<0.050	ug/L				
3369883	Dissolved Titanium (Ti)	2013/10/01	105	80 - 120	94	80 - 120	<5.0	ug/L				

Maxxam Job #: B3G2546
 Report Date: 2013/10/02

Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: JB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3369883	Dissolved Uranium (U)	2013/10/01	100	80 - 120	98	80 - 120	<0.10	ug/L				
3369883	Dissolved Vanadium (V)	2013/10/01	105	80 - 120	97	80 - 120	<0.50	ug/L				
3369883	Dissolved Zinc (Zn)	2013/10/01	93	80 - 120	97	80 - 120	<5.0	ug/L				

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.


NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Validation Signature Page

Maxxam Job #: B3G2546

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



Cristina Carriere, Scientific Services

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

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: #1326 Golder Associates Ltd	Company Name: <u>Golder Associates</u>	Quotation #: B24075	MAXXAM JOB #:	BOTTLE ORDER #:		437844	
Contact Name: <u>Steve</u>	Contact Name: <u>Reza Lachpaur</u>	P.O. #:	CHAIN OF CUSTODY #:		PROJECT MANAGER:		Antonella Brasil
Address: 6925 Century Ave Suite 100 Mississauga ON L5N 7K2	Address: <u>140 Renfrew Drive, Suite 110 Markham</u>	Project #: 09-1111-6091	CH#437844-01-01				
Phone: (905)567-4444 Fax: (905)567-6561	Phone: <u>905 475 2625 Ext: 6049</u> Fax:	Project Name:					
Email: <u>Maxxam@golder.com, jennifer.lachpaur@golder.com</u>	Email: <u>reza_lachpaur@golder.com</u>	Site #:					
		Sampled By: <u>JB</u>					

Regulation 153 (2011)		Other Regulations		SPECIAL INSTRUCTIONS		ANALYSIS REQUESTED (Please be specific)		TURNAROUND TIME (TAT) REQUIRED:		
<input type="checkbox"/> Table 1	<input type="checkbox"/> Rest/Park	<input type="checkbox"/> Medium/Fine	<input type="checkbox"/> CCME	<input type="checkbox"/> Sanitary Sewer Bylaw	Regulated Drinking Water? (Y/N) _____ Metals Field Filtered? (Y/N) _____ RCAP - Comprehensive _____		25-Sep-13 12:25 Antonella Brasil B3G2546 NNA ENV-634		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> Reg 558	<input type="checkbox"/> Storm Sewer Bylaw					Regular (Standard) TAT: (will be applied if Rush TAT is not specified) <input checked="" type="checkbox"/>	
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other	<input type="checkbox"/> For RSC	<input type="checkbox"/> MISA	<input type="checkbox"/> Municipality _____					Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.	
<input type="checkbox"/> Table _____			<input type="checkbox"/> PWQO	<input type="checkbox"/> Other _____					Job Specific Rush TAT (if applies to entire submission) <input type="checkbox"/>	
Include Criteria on Certificate of Analysis (Y/N)? _____								Date Required: _____ Time Required: <input type="checkbox"/>		
Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form								Rush Confirmation Number: _____ (call lab for #)		
SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM										

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	RCAP - Comprehensive	Analysis Requested		# of Bottles	Comments
1	BH128A	Sept 25/13	9:30	GW	NY	Y	✓			4	
2	BH126B	Sept 25/13	10:30	GW	NY	Y	✓			4	
3											
4											
5											
6											
7											
8											
9											
10											

*RELINQUISHED BY: (Signature/Print) <u>J. Balaban</u>		Date: (YY/MM/DD) <u>13/09/25</u>	Time: <u>12:25</u>	RECEIVED BY: (Signature/Print) <u>Christina Kowal</u>		Date: (YY/MM/DD) <u>2013/09/25</u>	Time: <u>12:25</u>	# Jars Used and Not Submitted	Laboratory Use Only			
								Time Sensitive	Temperature (°C) on Receipt <u>6/7/6°C</u>	Custody Seal	Yes	No <input checked="" type="checkbox"/>
										Present		
										Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.
Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: 09-1111-6091
 Site#: 09-1111-6091
 Your C.O.C. #: 27204419, 272044-191-01

Attention: Reza Lackpour

Golder Associates Ltd
 140 Renfrew Dr
 Suite 110
 Markham, ON
 L3R 6B3

Report Date: 2013/10/07

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G6616

Received: 2013/10/01, 13:15

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
1,3-Dichloropropene Sum	1	N/A	2013/10/07	CAM SOP-00226	EPA 8260
Petroleum Hydro. CCME F1 & BTEX in Water	1	N/A	2013/10/05	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water	1	2013/10/05	2013/10/06	CAM SOP-00316	CCME Hydrocarbons
Polychlorinated Biphenyl in Water	1	2013/10/02	2013/10/03	CAM SOP-00309	SW846 8082
Volatile Organic Compounds in Water	1	N/A	2013/10/04	CAM SOP 00228	EPA 8260 modified

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
 * Results relate only to the items tested.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Antonella Brasil, Project Manager
 Email: ABrasil@maxxam.ca
 Phone# (905) 817-5817

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

Total cover pages: 1

Maxxam Job #: B3G6616
 Report Date: 2013/10/07

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: GR

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		TH4403		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	3371186
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	3372460
Benzene	ug/L	<0.20	0.20	3372460
Bromodichloromethane	ug/L	<0.50	0.50	3372460
Bromoform	ug/L	<1.0	1.0	3372460
Bromomethane	ug/L	<0.50	0.50	3372460
Carbon Tetrachloride	ug/L	<0.20	0.20	3372460
Chlorobenzene	ug/L	<0.20	0.20	3372460
Chloroform	ug/L	<0.20	0.20	3372460
Dibromochloromethane	ug/L	<0.50	0.50	3372460
1,2-Dichlorobenzene	ug/L	<0.50	0.50	3372460
1,3-Dichlorobenzene	ug/L	<0.50	0.50	3372460
1,4-Dichlorobenzene	ug/L	<0.50	0.50	3372460
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	3372460
1,1-Dichloroethane	ug/L	<0.20	0.20	3372460
1,2-Dichloroethane	ug/L	<0.50	0.50	3372460
1,1-Dichloroethylene	ug/L	<0.20	0.20	3372460
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	3372460
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	3372460
1,2-Dichloropropane	ug/L	<0.20	0.20	3372460
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	3372460
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	3372460
Ethylbenzene	ug/L	<0.20	0.20	3372460
Ethylene Dibromide	ug/L	<0.20	0.20	3372460
Hexane	ug/L	<1.0	1.0	3372460
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	3372460
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	3372460
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	3372460
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	3372460
Styrene	ug/L	<0.50	0.50	3372460
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	3372460
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	3372460
Tetrachloroethylene	ug/L	<0.20	0.20	3372460
Toluene	ug/L	<0.20	0.20	3372460

 RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6616
 Report Date: 2013/10/07

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: GR

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		TH4403		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
1,1,1-Trichloroethane	ug/L	<0.20	0.20	3372460
1,1,2-Trichloroethane	ug/L	<0.50	0.50	3372460
Trichloroethylene	ug/L	<0.20	0.20	3372460
Vinyl Chloride	ug/L	<0.20	0.20	3372460
p+m-Xylene	ug/L	<0.20	0.20	3372460
o-Xylene	ug/L	<0.20	0.20	3372460
Xylene (Total)	ug/L	<0.20	0.20	3372460
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	3372460
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	94		3372460
D4-1,2-Dichloroethane	%	116		3372460
D8-Toluene	%	95		3372460

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		TH4403		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
BTEX & F1 Hydrocarbons				
F1 (C6-C10)	ug/L	<25	25	3375636
F1 (C6-C10) - BTEX	ug/L	<25	25	3375636
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	3375673
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	3375673
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	3375673
Reached Baseline at C50	ug/L	YES		3375673
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	105		3375636
4-Bromofluorobenzene	%	98		3375636
D10-Ethylbenzene	%	92		3375636
D4-1,2-Dichloroethane	%	98		3375636
o-Terphenyl	%	92		3375673

 RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6616
 Report Date: 2013/10/07

Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: GR

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		TH4403	TH4403		
Sampling Date		2013/09/30 14:55	2013/09/30 14:55		
	Units	BH126B	BH126B Lab-Dup	RDL	QC Batch
PCBs					
Aroclor 1242	ug/L	<0.05	<0.05	0.05	3371968
Aroclor 1248	ug/L	<0.05	<0.05	0.05	3371968
Aroclor 1254	ug/L	<0.05	<0.05	0.05	3371968
Aroclor 1260	ug/L	<0.05	<0.05	0.05	3371968
Total PCB	ug/L	<0.05	<0.05	0.05	3371968
Surrogate Recovery (%)					
Decachlorobiphenyl	%	66	67		3371968

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6616
 Report Date: 2013/10/07

Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: GR

Test Summary

Maxxam ID TH4403
Sample ID BH126B
Matrix Water

Collected 2013/09/30
Shipped
Received 2013/10/01

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	3371186	N/A	2013/10/07	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Wat	HSGC/MSFD	3375636	N/A	2013/10/05	Yang Yu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	3375673	2013/10/05	2013/10/06	Biljana Lazovic
Polychlorinated Biphenyl in Water	GC/ECD	3371968	2013/10/02	2013/10/03	Sarah Huang
Volatile Organic Compounds in Water	GC/MS	3372460	N/A	2013/10/04	Nalini Ramballack

Maxxam ID TH4403 Dup
Sample ID BH126B
Matrix Water

Collected 2013/09/30
Shipped
Received 2013/10/01

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	3371968	2013/10/02	2013/10/03	Sarah Huang

Maxxam Job #: B3G6616
Report Date: 2013/10/07

Golder Associates Ltd
Client Project #: 09-1111-6091

Sampler Initials: GR

Package 1	2.7°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Maxxam Job #: B3G6616
 Report Date: 2013/10/07

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: GR

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3371968	Decachlorobiphenyl	2013/10/03	70	60 - 130	60	60 - 130	64	%		
3371968	Aroclor 1260	2013/10/03	87	60 - 130	65	60 - 130	<0.05	ug/L	NC	30
3371968	Total PCB	2013/10/03	87	60 - 130	65	60 - 130	<0.05	ug/L	NC	40
3371968	Aroclor 1242	2013/10/03					<0.05	ug/L	NC	30
3371968	Aroclor 1248	2013/10/03					<0.05	ug/L	NC	30
3371968	Aroclor 1254	2013/10/03					<0.05	ug/L	NC	30
3372460	4-Bromofluorobenzene	2013/10/04	100	70 - 130	100	70 - 130	93	%		
3372460	D4-1,2-Dichloroethane	2013/10/04	106	70 - 130	106	70 - 130	107	%		
3372460	D8-Toluene	2013/10/04	106	70 - 130	106	70 - 130	96	%		
3372460	Acetone (2-Propanone)	2013/10/05	116	60 - 140	111	60 - 140	<10	ug/L	NC	30
3372460	Benzene	2013/10/05	100	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
3372460	Bromodichloromethane	2013/10/05	104	70 - 130	112	70 - 130	<0.50	ug/L	NC	30
3372460	Bromoform	2013/10/05	103	70 - 130	108	70 - 130	<1.0	ug/L	NC	30
3372460	Bromomethane	2013/10/05	86	60 - 140	102	60 - 140	<0.50	ug/L	NC	30
3372460	Carbon Tetrachloride	2013/10/05	110	70 - 130	118	70 - 130	<0.20	ug/L	NC	30
3372460	Chlorobenzene	2013/10/05	98	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
3372460	Chloroform	2013/10/05	100	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
3372460	Dibromochloromethane	2013/10/05	102	70 - 130	109	70 - 130	<0.50	ug/L	NC	30
3372460	1,2-Dichlorobenzene	2013/10/05	103	70 - 130	109	70 - 130	<0.50	ug/L	NC	30
3372460	1,3-Dichlorobenzene	2013/10/05	98	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
3372460	1,4-Dichlorobenzene	2013/10/05	96	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
3372460	Dichlorodifluoromethane (FREON 12)	2013/10/05	67	60 - 140	86	60 - 140	<1.0	ug/L	NC	30
3372460	1,1-Dichloroethane	2013/10/05	100	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
3372460	1,2-Dichloroethane	2013/10/05	105	70 - 130	112	70 - 130	<0.50	ug/L	NC	30
3372460	1,1-Dichloroethylene	2013/10/05	103	70 - 130	113	70 - 130	<0.20	ug/L	NC	30
3372460	cis-1,2-Dichloroethylene	2013/10/05	NC	70 - 130	102	70 - 130	<0.50	ug/L	5.4	30
3372460	trans-1,2-Dichloroethylene	2013/10/05	98	70 - 130	106	70 - 130	<0.50	ug/L	NC	30
3372460	1,2-Dichloropropane	2013/10/05	100	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
3372460	cis-1,3-Dichloropropene	2013/10/05	81	70 - 130	95	70 - 130	<0.30	ug/L	NC	30
3372460	trans-1,3-Dichloropropene	2013/10/05	94	70 - 130	114	70 - 130	<0.40	ug/L	NC	30
3372460	Ethylbenzene	2013/10/05	94	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
3372460	Ethylene Dibromide	2013/10/05	100	70 - 130	109	70 - 130	<0.20	ug/L	NC	30
3372460	Hexane	2013/10/05	96	70 - 130	107	70 - 130	<1.0	ug/L	NC	30
3372460	MethyleneChloride(Dichloromethane)	2013/10/05	110	70 - 130	117	70 - 130	<2.0	ug/L	NC	30
3372460	Methyl Isobutyl Ketone	2013/10/05	102	70 - 130	106	70 - 130	<5.0	ug/L	NC	30
3372460	Methyl Ethyl Ketone (2-Butanone)	2013/10/05	103	60 - 140	103	60 - 140	<10	ug/L	NC	30
3372460	Methyl t-butyl ether (MTBE)	2013/10/05	93	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
3372460	Styrene	2013/10/05	101	70 - 130	110	70 - 130	<0.50	ug/L	NC	30
3372460	1,1,1,2-Tetrachloroethane	2013/10/05	105	70 - 130	112	70 - 130	<0.50	ug/L	NC	30
3372460	1,1,2,2-Tetrachloroethane	2013/10/05	102	70 - 130	109	70 - 130	<0.50	ug/L	NC	30

Maxxam Job #: B3G6616
 Report Date: 2013/10/07

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: GR

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3372460	Tetrachloroethylene	2013/10/05	103	70 - 130	110	70 - 130	<0.20	ug/L	NC	30
3372460	Toluene	2013/10/05	97	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
3372460	1,1,1-Trichloroethane	2013/10/05	106	70 - 130	114	70 - 130	<0.20	ug/L	NC	30
3372460	1,1,2-Trichloroethane	2013/10/05	104	70 - 130	111	70 - 130	<0.50	ug/L	NC	30
3372460	Trichloroethylene	2013/10/05	NC	70 - 130	107	70 - 130	<0.20	ug/L	4.1	30
3372460	Vinyl Chloride	2013/10/05	87	70 - 130	100	70 - 130	<0.20	ug/L	2.9	30
3372460	p+m-Xylene	2013/10/05	95	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
3372460	o-Xylene	2013/10/05	91	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
3372460	Trichlorofluoromethane (FREON 11)	2013/10/05	100	70 - 130	110	70 - 130	<0.50	ug/L	NC	30
3372460	Xylene (Total)	2013/10/05					<0.20	ug/L	NC	30
3375636	1,4-Difluorobenzene	2013/10/05	108	70 - 130	102	70 - 130	105	%		
3375636	4-Bromofluorobenzene	2013/10/05	100	70 - 130	97	70 - 130	101	%		
3375636	D10-Ethylbenzene	2013/10/05	94	70 - 130	91	70 - 130	94	%		
3375636	D4-1,2-Dichloroethane	2013/10/05	96	70 - 130	97	70 - 130	102	%		
3375636	F1 (C6-C10)	2013/10/05	90	70 - 130	96	60 - 140	<25	ug/L	NC	30
3375636	F1 (C6-C10) - BTEX	2013/10/05					<25	ug/L	NC	30
3375673	o-Terphenyl	2013/10/06	99	50 - 130	105	50 - 130	96	%		
3375673	F2 (C10-C16 Hydrocarbons)	2013/10/06	111	50 - 130	110	70 - 130	<100	ug/L	NC	30
3375673	F3 (C16-C34 Hydrocarbons)	2013/10/06	106	50 - 130	106	70 - 130	<200	ug/L	NC	30
3375673	F4 (C34-C50 Hydrocarbons)	2013/10/06	102	50 - 130	103	70 - 130	<200	ug/L	NC	30

N/A = Not Applicable

RPD = Relative Percent Difference

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B3G6616

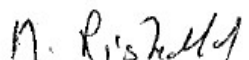
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Charles Ancker, B.Sc., M.Sc., C.Chem, Senior Analyst




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



Medhat Riskallah, Manager, Hydrocarbon Department

=====

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INVOICE INFORMATION:

Company Name: #1326 Golder Associates Ltd
 Contact Name: Central Acct: 1112 1113 1151 1111
 Address: 6925 Century Ave Suite 100, 2390 Argentea Rd, Mississauga ON L5N 5Z7
 Phone: 100 (905)567-4444 Fax: (905)567-6561
 Email: maxxam@golder.com, amber_moreira@golder.com

REPORT INFORMATION (if differs from invoice):

Company Name: Gillian Roos
 Contact Name: Gillian Roos
 Address: Gillian-roose@golder.com
 Email: gillian-roose@golder.com

PROJECT INFORMATION:

Quotation #: B24075
 P.O. #: CK1 ENV-837
 Project #: 09-1111-6091 (6000)
 Project Name: 09-1111-6091
 Site #: CWC
 Sampled By: CWC

LABORATORY USE ONLY:

B3G6616
 BOTTLE ORDER #: 272044
 CHAIN OF CUSTODY #: C#272044-191-01
 PROJECT MANAGER: MATHURA THIRUKKUMARA

Regulation 153 (2011)

Table 1 Res/Park
 Table 2 Ind/Comm
 Table 3 Agr/Other
 Table For RSC

Other Regulations

CCME
 Reg. 558
 MISA
 PWQO
 Other

Sanitary Sewer Bylaw
 Storm Sewer Bylaw
 Municipality

SPECIAL INSTRUCTIONS

ANALYSIS REQUESTED (Please be specific):

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT:
 (will be applied if Rush TAT is not specified)
 Standard TAT = 5-7 Working days for most tests.
 Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number: _____ (call lab for #)

Include Criteria on Certificate of Analysis (Y/N)? _____

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	ANALYSIS REQUESTED (Please be specific)										# of Bottles	Comments
							PCBS	PHCS	VOCs									
1	BH106B	30 Sep 13	14:55	GW	N	N	✓	✓	✓								10	slightly cloudy
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

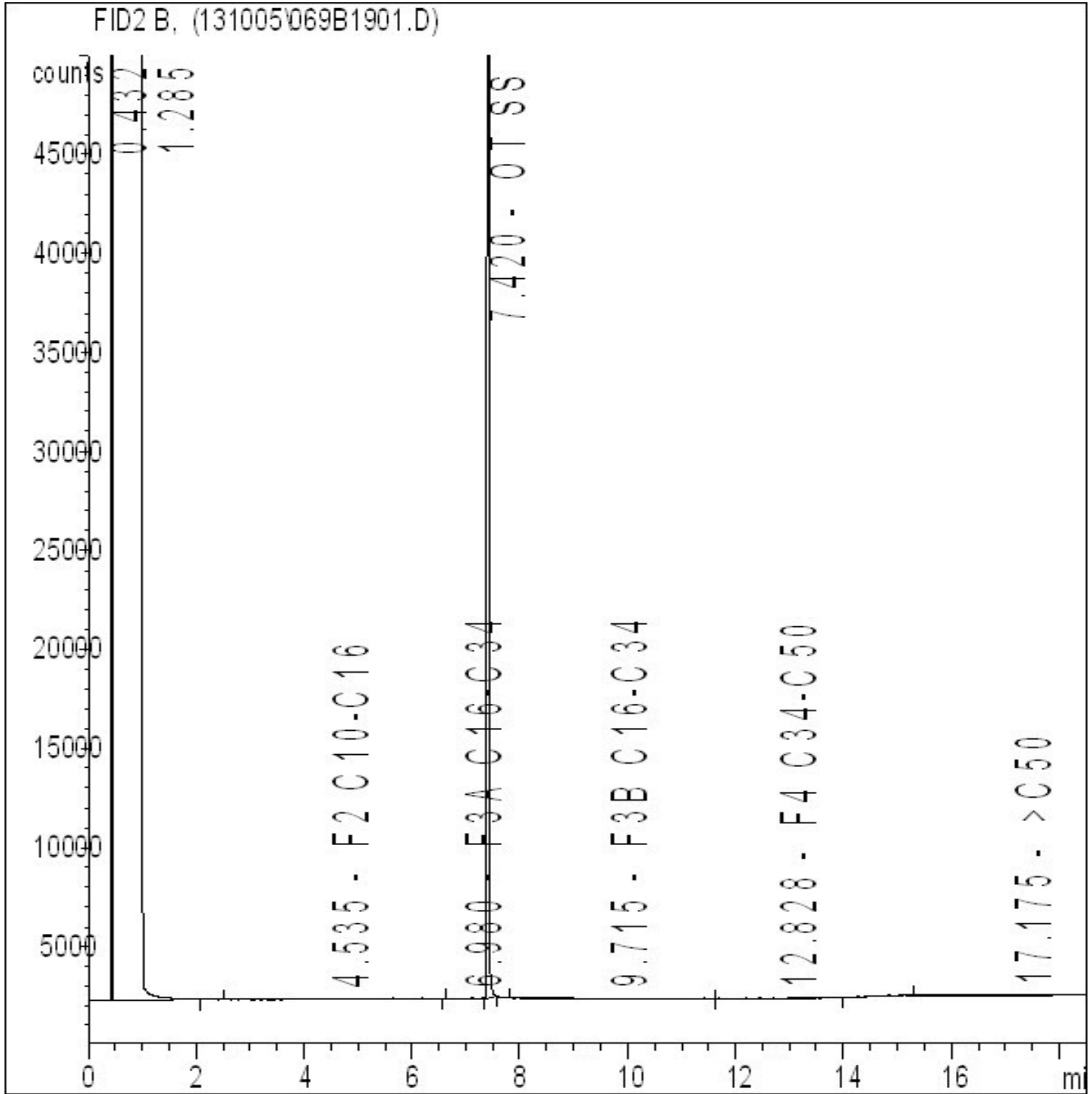
*RELINQUISHED BY: (Signature/Print) Clara Chan	Date: (YY/MM/DD) 2013/10/01	Time: 13:15	RECEIVED BY: (Signature/Print) Jennifer McConny	Date: (YY/MM/DD) 2013/10/01	Time: 13:15	# Jars Used and Not Submitted	Laboratory Use Only					
							Time Sensitive	Temperature (°C) on Receipt 013152	Custody Seal Present	Yes	No	

Report Date: 2013/10/07
Maxxam Job #: B3G6616
Maxxam Sample: TH4403

Golder Associates Ltd
Client Project #: 09-1111-6091

Client ID: BH126B

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 09-1111-6091
 Site#: 09-1111-6091
 Your C.O.C. #: 43812401, 438124-01-01

Attention: Reza Lackpour

Golder Associates Ltd
 140 Renfrew Dr
 Suite 110
 Markham, ON
 L3R 6B3

Report Date: 2013/10/10

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3G6084

Received: 2013/10/01, 09:00

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Sewer Use By-Law Semivolatile Organics	1	2013/10/02	2013/10/02	EPA 8270, CAM SOP 00301	GC/MS
Biochemical Oxygen Demand (BOD)	1	N/A	2013/10/07	CAM SOP-00427	APHA 5210B
Chromium (VI) in Water	1	N/A	2013/10/04	CAM SOP-00436	EPA 7199
Total Cyanide	1	2013/10/04	2013/10/04	CAM SOP-00457	Ontario MOE CN-E3015
Fluoride	1	2013/10/03	2013/10/04	CAM SOP-00449	APHA 4500FC
Mercury in Water by CVAA	1	2013/10/07	2013/10/08	CAM SOP-00453	SW-846 7470A
Total Metals Analysis by ICPMS	1	N/A	2013/10/09	CAM SOP-00447	EPA 6020
E.coli, (CFU/100mL)	1	N/A	2013/10/01	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2013/10/04	2013/10/08	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2013/10/04	2013/10/08	CAM SOP-00313	In-house Method
Animal and Vegetable Oil & Grease	1	N/A	2013/10/03	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2013/10/03	2013/10/03	CAM SOP-00326	EPA 1664A
OC Pesticides (Selected) & PCB (1)	1	2013/10/02	2013/10/03	CAM SOP-00307	SW846 8081,8082
OC Pesticides Summed Parameters	1	N/A	2013/10/02	CAM SOP-00307	SW846 8081, 8082
pH	1	N/A	2013/10/04	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	1	N/A	2013/10/03	CAM SOP-00444	MOE ROPHEN-E3179
Total Kjeldahl Nitrogen in Water	1	2013/10/03	2013/10/04	CAM SOP-00454	EPA 351.2 Rev 2
Total PAH's (2)	1	N/A	2013/10/03	CAM SOP - 00301	EPA 8270
TPH (Heavy Oil) (3)	1	2013/10/03	2013/10/03	CAM SOP-00326	SM 5520F
Total Suspended Solids	1	N/A	2013/10/03	CAM SOP-00428	SM 2540D
Volatile Organic Compounds in Water	1	N/A	2013/10/04	CAM SOP-00226	EPA 8260 modified

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

* Results relate only to the items tested.

(1) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

(2) Total PAHs include only those PAHs specified in the sewer use by-by-law.

(3) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Maxxam Job #: B3G6084
Report Date: 2013/10/10

Golder Associates Ltd
Client Project #: 09-1111-6091

Sampler Initials: CWI

-2-

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Antonella Brasil, Project Manager
Email: ABrasil@maxxam.ca
Phone# (905) 817-5817

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

Total cover pages: 2

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

RESULTS OF ANALYSES OF WATER

Maxxam ID		TH2108		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3370061
Inorganics				
Total BOD	mg/L	<2.0	2.0	3370771
Fluoride (F-)	mg/L	0.21	0.10	3374008
Total Kjeldahl Nitrogen (TKN)	mg/L	0.37	0.10	3373070
pH	pH	7.99		3374009
Phenols-4AAP	mg/L	<0.0010	0.0010	3372293
Total Suspended Solids	mg/L	170	10	3373066
Total Cyanide (CN)	mg/L	<0.0050	0.0050	3374116
Miscellaneous Parameters				
Nonylphenol (Total)	mg/L	<0.001	0.001	3374752
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	3372388
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3372391

NONYL PHENOL AND NONYL PHENOL ETHOXYLATE (WATER)

Maxxam ID		TH2108	TH2108		
Sampling Date		2013/09/30 14:55	2013/09/30 14:55		
	Units	BH126B	BH126B Lab-Dup	RDL	QC Batch
Miscellaneous Parameters					
Nonylphenol Ethoxylate (Total)	mg/L	<0.005	<0.005	0.005	3374758

 RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		TH2108	TH2108		
Sampling Date		2013/09/30 14:55	2013/09/30 14:55		
	Units	BH126B	BH126B Lab-Dup	RDL	QC Batch
Metals					
Chromium (VI)	ug/L	0.75		0.50	3373354
Mercury (Hg)	mg/L	<0.00010	<0.00010	0.00010	3376902
Total Aluminum (Al)	ug/L	1800		5.0	3379313
Total Antimony (Sb)	ug/L	<0.50		0.50	3379313
Total Arsenic (As)	ug/L	<1.0		1.0	3379313
Total Cadmium (Cd)	ug/L	<0.10		0.10	3379313
Total Chromium (Cr)	ug/L	<5.0		5.0	3379313
Total Cobalt (Co)	ug/L	1.1		0.50	3379313
Total Copper (Cu)	ug/L	3.7		1.0	3379313
Total Lead (Pb)	ug/L	1.4		0.50	3379313
Total Manganese (Mn)	ug/L	71		2.0	3379313
Total Molybdenum (Mo)	ug/L	1.2		0.50	3379313
Total Nickel (Ni)	ug/L	2.7		1.0	3379313
Total Phosphorus (P)	ug/L	110		100	3379313
Total Selenium (Se)	ug/L	<2.0		2.0	3379313
Total Silver (Ag)	ug/L	<0.10		0.10	3379313
Total Tin (Sn)	ug/L	2.4		1.0	3379313
Total Titanium (Ti)	ug/L	98		5.0	3379313
Total Zinc (Zn)	ug/L	10		5.0	3379313

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TH2108		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
Semivolatile Organics				
Di-N-butyl phthalate	ug/L	<2	2	3370793
Bis(2-ethylhexyl)phthalate	ug/L	<2	2	3370793
3,3'-Dichlorobenzidine	ug/L	<0.8	0.8	3370793
Pentachlorophenol	ug/L	<1	1	3370793
Phenanthrene	ug/L	<0.2	0.2	3370793
Anthracene	ug/L	<0.2	0.2	3370793
Fluoranthene	ug/L	<0.2	0.2	3370793
Pyrene	ug/L	<0.2	0.2	3370793
Benzo(a)anthracene	ug/L	<0.2	0.2	3370793
Chrysene	ug/L	<0.2	0.2	3370793
Benzo(b/j)fluoranthene	ug/L	<0.2	0.2	3370793
Benzo(k)fluoranthene	ug/L	<0.2	0.2	3370793
Benzo(a)pyrene	ug/L	<0.2	0.2	3370793
Indeno(1,2,3-cd)pyrene	ug/L	<0.2	0.2	3370793
Dibenz(a,h)anthracene	ug/L	<0.2	0.2	3370793
Benzo(g,h,i)perylene	ug/L	<0.2	0.2	3370793
Dibenzo(a,i)pyrene	ug/L	<0.2	0.2	3370793
Benzo(e)pyrene	ug/L	<0.2	0.2	3370793
Perylene	ug/L	<0.2	0.2	3370793
Dibenzo(a,j) acridine	ug/L	<0.4	0.4	3370793
7H-Dibenzo(c,g) Carbazole	ug/L	<0.4	0.4	3370793
1,6-Dinitropyrene	ug/L	<0.4	0.4	3370793
1,3-Dinitropyrene	ug/L	<0.4	0.4	3370793
1,8-Dinitropyrene	ug/L	<0.4	0.4	3370793
Calculated Parameters				
Total PAHs (18 PAHs)	ug/L	<1	1	3370073
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	64		3370793
2-Fluorobiphenyl	%	59		3370793
D14-Terphenyl (FS)	%	92		3370793
D5-Nitrobenzene	%	69		3370793
D8-Acenaphthylene	%	71		3370793

 RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		TH2108		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
Volatiles Organics				
Benzene	ug/L	<0.10	0.10	3372187
Chloroform	ug/L	<0.10	0.10	3372187
1,2-Dichlorobenzene	ug/L	<0.20	0.20	3372187
1,4-Dichlorobenzene	ug/L	<0.20	0.20	3372187
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	3372187
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	3372187
Ethylbenzene	ug/L	<0.10	0.10	3372187
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	3372187
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	3372187
Tetrachloroethylene	ug/L	<0.10	0.10	3372187
Toluene	ug/L	<0.20	0.20	3372187
Trichloroethylene	ug/L	<0.10	0.10	3372187
p+m-Xylene	ug/L	<0.10	0.10	3372187
o-Xylene	ug/L	<0.10	0.10	3372187
Xylene (Total)	ug/L	<0.10	0.10	3372187
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	94		3372187
D4-1,2-Dichloroethane	%	102		3372187
D8-Toluene	%	96		3372187

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

ORGANOCHLORINATED PESTICIDES BY GC-ECD (WATER)

Maxxam ID		TH2108		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
Calculated Parameters				
Aldrin + Dieldrin	ug/L	<0.005	0.005	3369462
Chlordane (Total)	ug/L	<0.005	0.005	3369462
o,p-DDT + p,p-DDT	ug/L	<0.005	0.005	3369462
Total PCB	ug/L	<0.05	0.05	3369462
Pesticides & Herbicides				
Aldrin	ug/L	<0.005	0.005	3372343
Dieldrin	ug/L	<0.005	0.005	3372343
α-Chlordane	ug/L	<0.005	0.005	3372343
γ-Chlordane	ug/L	<0.005	0.005	3372343
o,p-DDT	ug/L	<0.005	0.005	3372343
p,p-DDT	ug/L	<0.005	0.005	3372343
Lindane	ug/L	<0.003	0.003	3372343
Hexachlorobenzene	ug/L	<0.005	0.005	3372343
Mirex	ug/L	<0.005	0.005	3372343
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	91		3372343
Decachlorobiphenyl	%	120		3372343

MICROBIOLOGY (WATER)

Maxxam ID		TH2108		
Sampling Date		2013/09/30 14:55		
	Units	BH126B	RDL	QC Batch
Microbiological				
Escherichia coli	CFU/100mL	180	10	3370236

 RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

Test Summary

Maxxam ID TH2108
Sample ID BH126B
Matrix Water

Collected 2013/09/30
Shipped
Received 2013/10/01

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Sewer Use By-Law Semivolatile Organics	GC/MS	3370793	2013/10/02	2013/10/02	Kathy Horvat
Biochemical Oxygen Demand (BOD)	BOD	3370771	N/A	2013/10/07	Hemang Trivedi
Chromium (VI) in Water	IC	3373354	N/A	2013/10/04	Sally Coughlin
Total Cyanide	TECH/CN	3374116	2013/10/04	2013/10/04	Xuanhong Qiu
Fluoride	F	3374008	2013/10/03	2013/10/04	Surinder Rai
Mercury in Water by CVAA	CVAA	3376902	2013/10/07	2013/10/08	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	3379313	N/A	2013/10/09	Hua Ren
E.coli, (CFU/100mL)	PL	3370236	N/A	2013/10/01	Sirimathie Aluthwala
Total Nonylphenol in Liquids by HPLC	LC/FLU	3374752	2013/10/04	2013/10/08	Marian Godax
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	3374758	2013/10/04	2013/10/08	Marian Godax
Animal and Vegetable Oil & Grease	BAL	3370061	N/A	2013/10/03	Automated Statchk
Total Oil and Grease	BAL	3372388	2013/10/03	2013/10/03	Amjad Mir
OC Pesticides (Selected) & PCB	GC/ECD	3372343	2013/10/02	2013/10/03	Joy Zhang
OC Pesticides Summed Parameters	CALC	3369462	N/A	2013/10/02	Automated Statchk
pH	PH	3374009	N/A	2013/10/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	3372293	N/A	2013/10/03	Bramdeo Motiram
Total Kjeldahl Nitrogen in Water	AC	3373070	2013/10/03	2013/10/04	Chandra Nandlal
Total PAH's	CALC	3370073	N/A	2013/10/03	Automated Statchk
TPH (Heavy Oil)	BAL	3372391	2013/10/03	2013/10/03	Amjad Mir
Total Suspended Solids	SLDS	3373066	N/A	2013/10/03	Malik Kai Morgan John
Volatile Organic Compounds in Water	P&T/MS	3372187	N/A	2013/10/04	Blair Gannon

Maxxam ID TH2108 Dup
Sample ID BH126B
Matrix Water

Collected 2013/09/30
Shipped
Received 2013/10/01

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury in Water by CVAA	CVAA	3376902	2013/10/07	2013/10/08	Magdalena Carlos
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	3374758	2013/10/04	2013/10/08	Marian Godax

Maxxam Job #: B3G6084
Report Date: 2013/10/10

Golder Associates Ltd
Client Project #: 09-1111-6091

Sampler Initials: CWI

Package 1	7.0°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Sample TH2108-01: Total/Dissolved Chromium < Hexavalent Chromium: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3370771	Total BOD	2013/10/07					<2.0	mg/L	NC	25	104	85 - 115
3370793	2,4,6-Tribromophenol	2013/10/02	82	10 - 130	86	10 - 130	71	%				
3370793	2-Fluorobiphenyl	2013/10/02	57	30 - 130	54	30 - 130	52	%				
3370793	D14-Terphenyl (FS)	2013/10/02	93	30 - 130	98	30 - 130	101	%				
3370793	D5-Nitrobenzene	2013/10/02	75	30 - 130	77	30 - 130	71	%				
3370793	D8-Acenaphthylene	2013/10/02	65	30 - 130	62	30 - 130	55	%				
3370793	Di-N-butyl phthalate	2013/10/03	90	30 - 130	87	30 - 130	<2	ug/L	NC	40		
3370793	Bis(2-ethylhexyl)phthalate	2013/10/03	93	30 - 130	95	30 - 130	<2	ug/L	NC	40		
3370793	3,3'-Dichlorobenzidine	2013/10/03	78	30 - 130	97	30 - 130	<0.8	ug/L	NC	40		
3370793	Pentachlorophenol	2013/10/03	35	30 - 130	59	30 - 130	<1	ug/L	NC	40		
3370793	Phenanthrene	2013/10/03	95	30 - 130	98	30 - 130	<0.2	ug/L	NC	40		
3370793	Anthracene	2013/10/03	94	30 - 130	99	30 - 130	<0.2	ug/L	NC	40		
3370793	Fluoranthene	2013/10/03	86	30 - 130	91	30 - 130	<0.2	ug/L	NC	40		
3370793	Pyrene	2013/10/03	89	30 - 130	92	30 - 130	<0.2	ug/L	NC	40		
3370793	Benzo(a)anthracene	2013/10/03	105	30 - 130	108	30 - 130	<0.2	ug/L	NC	40		
3370793	Chrysene	2013/10/03	111	30 - 130	115	30 - 130	<0.2	ug/L	NC	40		
3370793	Benzo(b)fluoranthene	2013/10/03	95	30 - 130	98	30 - 130	<0.2	ug/L	NC	40		
3370793	Benzo(k)fluoranthene	2013/10/03	101	30 - 130	105	30 - 130	<0.2	ug/L	NC	40		
3370793	Benzo(a)pyrene	2013/10/03	91	30 - 130	94	30 - 130	<0.2	ug/L	NC	40		
3370793	Indeno(1,2,3-cd)pyrene	2013/10/03	93	30 - 130	96	30 - 130	<0.2	ug/L	NC	40		
3370793	Dibenz(a,h)anthracene	2013/10/03	92	30 - 130	92	30 - 130	<0.2	ug/L	NC	40		
3370793	Benzo(g,h,i)perylene	2013/10/03	95	30 - 130	94	30 - 130	<0.2	ug/L	NC	40		
3370793	Dibenzo(a,i)pyrene	2013/10/03	86	N/A	78	30 - 130	<0.2	ug/L	NC	40		
3370793	Benzo(e)pyrene	2013/10/03	102	30 - 130	105	30 - 130	<0.2	ug/L	NC	40		
3370793	Perylene	2013/10/03	99	30 - 130	102	30 - 130	<0.2	ug/L	NC	40		
3370793	Dibenzo(a,j)acridine	2013/10/03	101	30 - 130	73	30 - 130	<0.4	ug/L	NC	40		
3370793	7H-Dibenzo(c,g)Carbazole	2013/10/03	95	30 - 130	101	30 - 130	<0.4	ug/L	NC	40		
3370793	1,6-Dinitropyrene	2013/10/03	95	30 - 130	99	30 - 130	<0.4	ug/L	NC	40		
3370793	1,3-Dinitropyrene	2013/10/03	95	30 - 130	104	30 - 130	<0.4	ug/L	NC	40		
3370793	1,8-Dinitropyrene	2013/10/03	92	30 - 130	99	30 - 130	<0.4	ug/L	NC	40		
3372187	4-Bromofluorobenzene	2013/10/04	102	70 - 130	105	70 - 130	95	%				
3372187	D4-1,2-Dichloroethane	2013/10/04	99	70 - 130	100	70 - 130	102	%				
3372187	D8-Toluene	2013/10/04	100	70 - 130	102	70 - 130	96	%				
3372187	Benzene	2013/10/04	98	70 - 130	99	70 - 130	<0.10	ug/L	NC	30		
3372187	Chloroform	2013/10/04	97	70 - 130	97	70 - 130	<0.10	ug/L				
3372187	1,2-Dichlorobenzene	2013/10/04	101	70 - 130	101	70 - 130	<0.20	ug/L				
3372187	1,4-Dichlorobenzene	2013/10/04	99	70 - 130	99	70 - 130	<0.20	ug/L				
3372187	cis-1,2-Dichloroethylene	2013/10/04	90	70 - 130	99	70 - 130	<0.10	ug/L				
3372187	trans-1,3-Dichloropropene	2013/10/04	105	70 - 130	108	70 - 130	<0.20	ug/L				
3372187	Ethylbenzene	2013/10/04	99	70 - 130	102	70 - 130	<0.10	ug/L	NC	30		

Maxxam Job #: B3G6084
 Report Date: 2013/10/10

 Golder Associates Ltd
 Client Project #: 09-1111-6091

Sampler Initials: CWI

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3372187	MethyleneChloride(Dichloromethane)	2013/10/04	106	70 - 130	107	70 - 130	<0.50	ug/L				
3372187	1,1,2,2-Tetrachloroethane	2013/10/04	99	70 - 130	103	70 - 130	<0.20	ug/L				
3372187	Tetrachloroethylene	2013/10/04	103	70 - 130	104	70 - 130	<0.10	ug/L				
3372187	Toluene	2013/10/04	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30		
3372187	Trichloroethylene	2013/10/04	100	70 - 130	100	70 - 130	<0.10	ug/L				
3372187	p+m-Xylene	2013/10/04	102	70 - 130	104	70 - 130	<0.10	ug/L	NC	30		
3372187	o-Xylene	2013/10/04	100	70 - 130	103	70 - 130	<0.10	ug/L	NC	30		
3372187	Xylene (Total)	2013/10/04					<0.10	ug/L	NC	30		
3372293	Phenols-4AAP	2013/10/03	92	80 - 120	109	85 - 115	<0.0010	mg/L	NC	25		
3372343	2,4,5,6-Tetrachloro-m-xylene	2013/10/03	105	50 - 130	91	50 - 130	91	%				
3372343	Decachlorobiphenyl	2013/10/03	65	50 - 130	129	50 - 130	123	%				
3372343	Aldrin	2013/10/03	92	50 - 130	92	50 - 130	<0.005	ug/L	NC	30		
3372343	Dieldrin	2013/10/03	108	50 - 130	112	50 - 130	<0.005	ug/L	NC	30		
3372343	a-Chlordane	2013/10/03	100	50 - 130	101	50 - 130	<0.005	ug/L	NC	30		
3372343	g-Chlordane	2013/10/03	104	50 - 130	105	50 - 130	<0.005	ug/L	NC	30		
3372343	o,p-DDT	2013/10/03	100	50 - 130	93	50 - 130	<0.005	ug/L	NC	30		
3372343	p,p-DDT	2013/10/03	104	50 - 130	86	50 - 130	<0.005	ug/L	NC	30		
3372343	Lindane	2013/10/03	94	50 - 130	98	50 - 130	<0.003	ug/L	NC	30		
3372343	Hexachlorobenzene	2013/10/03	94	50 - 130	91	50 - 130	<0.005	ug/L	NC	30		
3372343	Mirex	2013/10/03	74	30 - 130	97	30 - 130	<0.005	ug/L	NC	40		
3372388	Total Oil & Grease	2013/10/03			93	85 - 115	<0.50	mg/L	4.2	25		
3372391	Total Oil & Grease Mineral/Synthetic	2013/10/03			92	85 - 115	<0.50	mg/L	2.7	25		
3373066	Total Suspended Solids	2013/10/03					<10	mg/L	NC	25	97	85 - 115
3373070	Total Kjeldahl Nitrogen (TKN)	2013/10/04	NC	80 - 120	110	80 - 120	0.14, RDL=0.10	mg/L	9.2	20	112	N/A
3373354	Chromium (VI)	2013/10/04	98	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
3374008	Fluoride (F-)	2013/10/04	110	80 - 120	103	80 - 120	<0.10	mg/L	NC	20		
3374116	Total Cyanide (CN)	2013/10/04	100	80 - 120	97	80 - 120	<0.0050	mg/L	NC	20		
3374752	Nonylphenol (Total)	2013/10/08	76	50 - 130	93	50 - 130	<0.001	mg/L	NC	40		
3374758	Nonylphenol Ethoxylate (Total)	2013/10/08	71	50 - 130	81	50 - 130	<0.005	mg/L	NC	40		
3376902	Mercury (Hg)	2013/10/08	105	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20		
3379313	Total Aluminum (Al)	2013/10/09	NC	80 - 120	103	80 - 120	<5.0	ug/L				
3379313	Total Antimony (Sb)	2013/10/09	105	80 - 120	106	80 - 120	<0.50	ug/L				
3379313	Total Arsenic (As)	2013/10/09	104	80 - 120	102	80 - 120	<1.0	ug/L				
3379313	Total Cadmium (Cd)	2013/10/09	102	80 - 120	106	80 - 120	<0.10	ug/L				
3379313	Total Chromium (Cr)	2013/10/09	102	80 - 120	103	80 - 120	<5.0	ug/L				
3379313	Total Cobalt (Co)	2013/10/09	103	80 - 120	104	80 - 120	<0.50	ug/L				
3379313	Total Copper (Cu)	2013/10/09	102	80 - 120	101	80 - 120	<1.0	ug/L				
3379313	Total Lead (Pb)	2013/10/09	101	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
3379313	Total Manganese (Mn)	2013/10/09	103	80 - 120	105	80 - 120	<2.0	ug/L				
3379313	Total Molybdenum (Mo)	2013/10/09	105	80 - 120	107	80 - 120	<0.50	ug/L				

Maxxam Job #: B3G6084
Report Date: 2013/10/10

Golder Associates Ltd
Client Project #: 09-1111-6091

Sampler Initials: CWI

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3379313	Total Nickel (Ni)	2013/10/09	103	80 - 120	103	80 - 120	<1.0	ug/L				
3379313	Total Phosphorus (P)	2013/10/09	101	80 - 120	104	80 - 120	<100	ug/L				
3379313	Total Selenium (Se)	2013/10/09	103	80 - 120	104	80 - 120	<2.0	ug/L				
3379313	Total Silver (Ag)	2013/10/09	103	80 - 120	106	80 - 120	<0.10	ug/L				
3379313	Total Tin (Sn)	2013/10/09	104	80 - 120	105	80 - 120	<1.0	ug/L				
3379313	Total Titanium (Ti)	2013/10/09	109	80 - 120	102	80 - 120	<5.0	ug/L				
3379313	Total Zinc (Zn)	2013/10/09	104	80 - 120	103	80 - 120	<5.0	ug/L				

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

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

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

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

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

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

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



NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

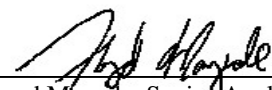
Validation Signature Page

Maxxam Job #: B3G6084

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

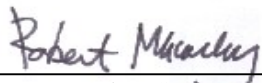
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist



Floyd Mayede, Senior Analyst



Mahiuddin Khan, GC Analysts



Robert Macaulay, Senior Analyst

Validation Signature Page

Maxxam Job #: B3G6084

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



Sirimathe Aluthwala, Campobello Micro

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



Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free 800-563-6266 Fax: (905) 817-5779 www.maxxam.ca

CHAIN OF CUSTODY

1-Oct-13 09:00

Antonella Brasil



B3G6084

AKP ENV-836

Page 1 of 1

INVOICE INFORMATION:

Company Name: #1326 Golder Associates Ltd
Contact Name: Central Accounting: 1111
Address: 6925 Century Ave Suite 100
Mississauga ON L5N 7K2
Phone: (905)567-4444 Fax: (905)567-6561
Email: Jennifer_lee@golder.com, maxxam@golder.com, si

REPORT INFORMATION (if differs from invoice):

Company Name:
Contact Name: Gillian Roos
Address:
Phone: (905)567-6100 x1727 Fax:
Email: gillian_roos@golder.com

PROJECT INFORMATION:

Quotation #: B24075
P.O. #:
Project #: 09-1111-6091(6000)
Project Name:
Site #: 09-1111-0691
Sampled By: CWI

CHAIN OF CUSTODY #:

C#438124-01-01

BOTTLE ORDER #:

438124

PROJECT MANAGER:
Antonella Brasil

Regulation 153 (2011)

Table 1 Res/Park Medium/Fine
 Table 2 Ind/Comm Coarse
 Table 3 Agri/Other
 Table 4 For RSC

Other Regulations

CCME Sanitary Sewer Bylaw
 Reg. 558 Storm Sewer Bylaw
 MISA Municipality _____
 PWQO
 Other _____

SPECIAL INSTRUCTIONS

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required:

Rush Confirmation Number: _____ (call lab for #)

Include Criteria on Certificate of Analysis (Y/N)? _____
Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	Toronto Storm Sewer Bylaw	Fluoride	Total Kjeldahl Nitrogen in Water	Animal and Vegetable Oil & Grease	ANALYSIS REQUESTED (Please be specific)	# of Bottles	Comments
1	BH126B	30 Sept 13	14:55	GW	N	/	✓	✓	✓	✓		19	slightly cloudy
2													
3													
4													
5													
6													
7													
8													
9													
10													

*RELINQUISHED BY: (Signature/Print) Clara Chau Clara	Date: (YY/MM/DD) 2013/10/1	Time: 9:00am	RECEIVED BY: (Signature/Print) Antonella Brasil	Date: (YY/MM/DD) 2013/10/01	Time: 09:00	# Jars Used and Not Submitted	Laboratory Use Only			
						Time Sensitive	Temperature (°C) on Receipt 8/17/16°C	Custody Seal	Yes	No
								Present		✓
								Intact		✓

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.
Maxxam Analytics International Corporation o/a Maxxam Analytics
White: Maxxam Yellow: Client



REPORT



Project Property: *Un-named
Benesford Dr
Richmond Hill ON*

Report Type: *Custom-Build Your Own Report*

Order #: *20130308027*

Date: *March 18, 2013*

EcoLog ERIS Ltd.
Environmental Risk
Information Service Ltd. (ERIS)
A division of Glacier Media Inc.
P: 1.866.517.5204
E: info@erisinfo.com

www.erisinfo.com

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Executive Summary

Property Information:

Project Property: *Un-named
Benesford Dr Richmond Hill ON*

Order Information:

Order No.: *20130308027*
Date Requested: *19/03/2013*
Requested by: *MMM Group Ltd.*
Report Type: *Custom-Build Your Own Report*

Additional Products:

Executive Summary: Report Summary

Database	Name	Selected	On Site	Boundary to 0.25KM	Total
AAGR	Abandoned Aggregate Inventory	Y	0	0	0
AGR	Aggregate Inventory	Y	0	0	0
AMIS	Abandoned Mine Information System	Y	0	0	0
ANDR	Anderson's Waste Disposal Sites	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
BORE	Borehole	Y	0	4	4
CA	Certificates of Approval	Y	0	2	2
CFOT	Commercial Fuel Oil Tanks	Y	0	0	0
CHEM	Chemical Register	Y	0	0	0
COAL	Inventory of Coal Gasification Plants and Coal Tar Sites	Y	0	0	0
CONV	Compliance and Convictions	Y	0	0	0
CPU	Certificates of Property Use	Y	0	0	0
DRL	Drill Hole Database	Y	0	0	0
EASR	Environmental Activity and Sector Registry	Y	0	0	0
EBR	Environmental Registry	Y	0	0	0
ECA	Environmental Compliance Approval	Y	0	0	0
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	Y	0	2	2
EIS	Environmental Issues Inventory System	Y	0	0	0
EXP	List of TSSA Expired Facilities	Y	0	0	0
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FOFT	Fisheries & Oceans Fuel Tanks	Y	0	0	0
FST	Fuel Storage Tank	Y	0	0	0
GEN	Ontario Regulation 347 Waste Generators Summary	Y	0	3	3
HINC	TSSA Historic Incidents	Y	0	2	2
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
INC	TSSA Incidents	Y	0	0	0
LIMO	Landfill Inventory Management Ontario	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NCPL	Non-Compliance Reports	Y	0	0	0
NDFT	National Defence & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defence & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0

Database	Name	Selected	On Site	Boundary to 0.25KM	Total
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	0	0
OGW	Oil and Gas Wells	Y	0	0	0
OOGW	Ontario Oil and Gas Wells	Y	0	0	0
OPCB	Inventory of PCB Storage Sites	Y	0	0	0
ORD	Orders	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	2	2
PINC	TSSA Pipeline Incidents	Y	0	0	0
PRT	Private and Retail Fuel Storage Tanks	Y	0	0	0
PTIW	Permit to Take Water	Y	0	0	0
REC	Ontario Regulation 347 Waste Receivers Summary	Y	0	0	0
RSC	Record of Site Condition	Y	0	1	1
RST	Retail Fuel Storage Tanks	Y	0	0	0
SCT	Scott's Manufacturing Directory	Y	0	1	1
SPL	Ontario Spills	Y	0	0	0
SRDS	Wastewater Discharger Registration Database	Y	0	0	0
TANK	Anderson's Storage Tanks	Y	0	0	0
TCFT	Transport Canada Fuel Storage Tanks	Y	0	0	0
VAR	TSSA Variances for Abandonment of Underground Storage Tanks	Y	0	0	0
WDS	Waste Disposal Sites - MOE CA Inventory	Y	0	0	0
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	Y	0	0	0
WWIS	Water Well Information System	Y	0	8	8
Total:			0	25	25

Executive Summary: Site Report Summary – Project Property

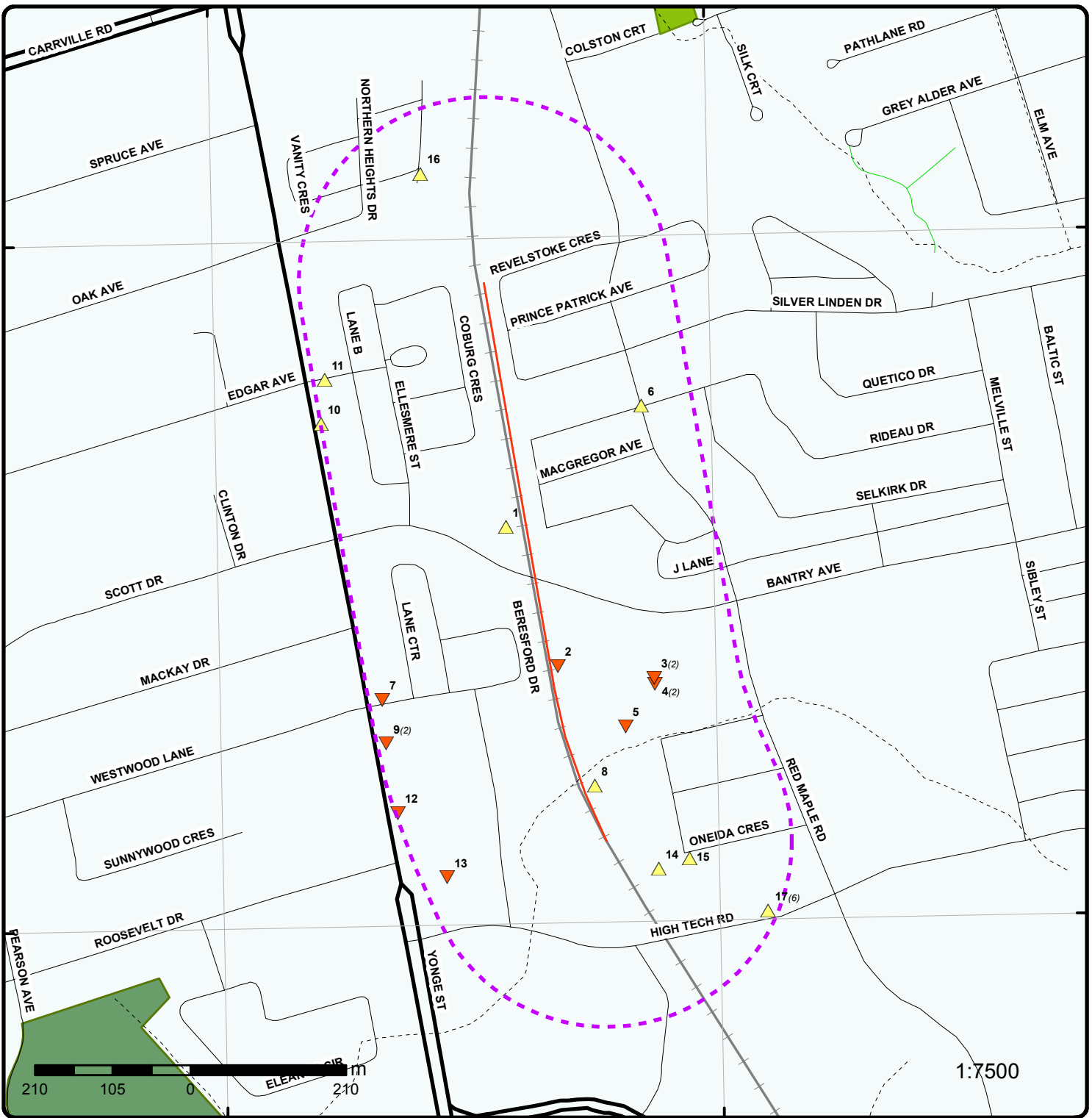
<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Page Number</i>
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No records found in the selected databases for the project property.

Executive Summary: Site Report Summary – Surrounding Properties

Map Key	DB	Company/Site Name	Address	Page Number
1	WWIS		lot 39 con 1 ON	10
2	BORE		ON	11
3	WWIS		ON	11
3	WWIS		ON	12
4	WWIS		ON	12
4	WWIS		RICHMOND HILL ON	13
5	WWIS		lot 38 con 1 ON	13
6	HINC		KING WILLIAM CRESCENT & RED MAPLE ROAD RICHMOND HILL ON	14
7	BORE		ON	15
8	WWIS		lot 38 con 1 ON	15
9	PES	SHOPPERS DRUG MART #1179 F. LO PHARMACY LTD.	8865 YONGE ST, UNIT #1 ON L4C 6Z1	RICHMOND HILL 16
9	PES	SHOPPERS DRUG MART #1179 F. LO PHARMACY LTD.	8865 YONGE ST, UNIT #1 ON L4C 6Z1	RICHMOND HILL 16
10	SCT	Lums Indus Supply Uniform-Med	9043 Yonge St Richmond Hill ON L4C 0L2	16
11	BORE		ON	17
12	EHS		8783, 8851 & 8889 Yonge St Richmond Hill ON	17
13	WWIS		lot 37 con 1 ON	18
14	BORE		ON	18
15	HINC		39 ONEIDA CRESCENT RICHMOND HILL ON	19
16	RSC	1671133 Ontario Inc.	Richmond Hill, ON	20
17	CA		50 High Tech Road Richmond Hill ON L4B 4N7	20
17	CA		50 High Tech Road Richmond Hill ON L4B 4N7	20
17	EHS		50 High Tech Rd. Richmond Hill ON L4B 4N7	21
17	GEN	YORK, THE REGIONAL MUNICIPALITY OF	50 High Tech Road 2nd Floor Richmond Hill ON L4B 4N7	21

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Page Number</i>
17	GEN	YORK, THE REGIONAL MUNICIPALITY OF HEALTH SERVICE	50 High Tech Road 2nd Floor Richmond Hill ON L4B 4N7	21
17	GEN	YORK, THE REGIONAL MUNICIPALITY OF	50 High Tech Road 2nd Floor Richmond Hill ON L4B 4N7	21

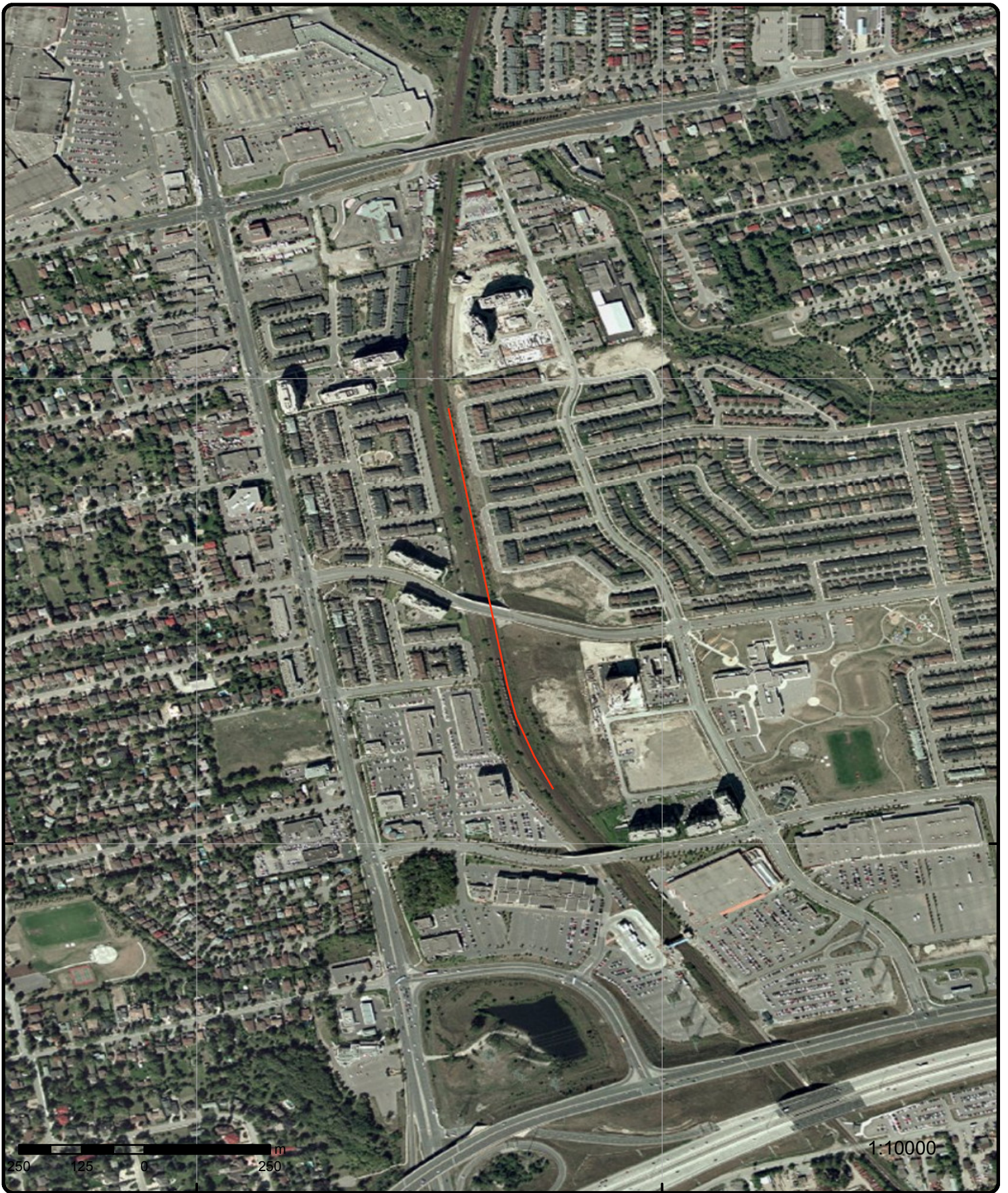


Map

Order No: 20130308027

Address: Benesford Dr, Richmond Hill, ON

Project Property	Expressway	Industrial and Resource - Regions	National Park
Buffer Outline	Principal Highway	Main Line	Provincial or Territorial Park
Eris Sites with Higher Elevation	Secondary Highway	Sidetrack	Other Park
Eris Sites with Same Elevation	Major Road	Transit Line	Golf Course or Driving Range
Eris Sites with Lower Elevation	Local road	Abandoned Line	Park or Sports Field
Eris Sites with Unknown Elevation	Trail	Pipelines and Transmission	Other Recreation Area
	Proposed Road		
	Ferry Route/Ice Road		



Aerial

Order No: 20130308027

Address: Benesford Dr, Richmond Hill, ON

Detail Report

Map Key	Number of Records	Elevation m	Site	DB		
1	1 of 1	197.6	lot 39 con 1 ON	WWIS		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Well Id: 6902908 Concession: 01 County: YORK Easting Nad83: 626315.7 Zone: 17 Primary Water Use: Secondary Water Use: Pump Rate: Flow Rate: Specific Capacity: Construction Method: Rotary (Convent.) Elevation (m): 205.529647 Depth to Bedrock: 172 Water Type:</p> <p>--- Details ---</p> <p>Thickness: 2 ft Material Colour: + Thickness: 10 ft Material Colour: BROWN + Thickness: 5 ft Material Colour: + Thickness: 57 ft Material Colour: BLUE + Thickness: 68 ft Material Colour: + Thickness: 22 ft Material Colour: + Thickness: 8 ft Material Colour: BLUE + Thickness: 6 ft Material Colour: BLUE + Thickness: 1 ft Material Colour:</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Lot: 039 Concession Name: YS E Municipality: RICHMOND HILL TOWN (MARKHAM) Northing Nad83: 4856023 Utm Reliability: margin of error : 100 m - 300 m Construction Date: 5/15/1951 Well Depth: 179 ft</p> <p>Static Water Level: Clear/Cloudy: Final Well Status: Test Hole Flowing (y/n): Elevation Reliability: Overburden/Bedrock: Mixed in a Layer Casing Material:</p> <p>Original Depth: 2 ft Material: TOPSOIL</p> <p>Original Depth: 12 ft Material: CLAY, BOULDERS</p> <p>Original Depth: 17 ft Material: CLAY, FINE SAND</p> <p>Original Depth: 74 ft Material: CLAY, BOULDERS, MEDIUM SAND</p> <p>Original Depth: 142 ft Material: CLAY, BOULDERS</p> <p>Original Depth: 164 ft Material: CLAY, MEDIUM SAND, SILT</p> <p>Original Depth: 172 ft Material: CLAY</p> <p>Original Depth: 178 ft Material: CLAY, SHALE</p> <p>Original Depth: 179 ft Material: SHALE</p> </td> </tr> </table>					<p>Well Id: 6902908 Concession: 01 County: YORK Easting Nad83: 626315.7 Zone: 17 Primary Water Use: Secondary Water Use: Pump Rate: Flow Rate: Specific Capacity: Construction Method: Rotary (Convent.) Elevation (m): 205.529647 Depth to Bedrock: 172 Water Type:</p> <p>--- Details ---</p> <p>Thickness: 2 ft Material Colour: + Thickness: 10 ft Material Colour: BROWN + Thickness: 5 ft Material Colour: + Thickness: 57 ft Material Colour: BLUE + Thickness: 68 ft Material Colour: + Thickness: 22 ft Material Colour: + Thickness: 8 ft Material Colour: BLUE + Thickness: 6 ft Material Colour: BLUE + Thickness: 1 ft Material Colour:</p>	<p>Lot: 039 Concession Name: YS E Municipality: RICHMOND HILL TOWN (MARKHAM) Northing Nad83: 4856023 Utm Reliability: margin of error : 100 m - 300 m Construction Date: 5/15/1951 Well Depth: 179 ft</p> <p>Static Water Level: Clear/Cloudy: Final Well Status: Test Hole Flowing (y/n): Elevation Reliability: Overburden/Bedrock: Mixed in a Layer Casing Material:</p> <p>Original Depth: 2 ft Material: TOPSOIL</p> <p>Original Depth: 12 ft Material: CLAY, BOULDERS</p> <p>Original Depth: 17 ft Material: CLAY, FINE SAND</p> <p>Original Depth: 74 ft Material: CLAY, BOULDERS, MEDIUM SAND</p> <p>Original Depth: 142 ft Material: CLAY, BOULDERS</p> <p>Original Depth: 164 ft Material: CLAY, MEDIUM SAND, SILT</p> <p>Original Depth: 172 ft Material: CLAY</p> <p>Original Depth: 178 ft Material: CLAY, SHALE</p> <p>Original Depth: 179 ft Material: SHALE</p>
<p>Well Id: 6902908 Concession: 01 County: YORK Easting Nad83: 626315.7 Zone: 17 Primary Water Use: Secondary Water Use: Pump Rate: Flow Rate: Specific Capacity: Construction Method: Rotary (Convent.) Elevation (m): 205.529647 Depth to Bedrock: 172 Water Type:</p> <p>--- Details ---</p> <p>Thickness: 2 ft Material Colour: + Thickness: 10 ft Material Colour: BROWN + Thickness: 5 ft Material Colour: + Thickness: 57 ft Material Colour: BLUE + Thickness: 68 ft Material Colour: + Thickness: 22 ft Material Colour: + Thickness: 8 ft Material Colour: BLUE + Thickness: 6 ft Material Colour: BLUE + Thickness: 1 ft Material Colour:</p>	<p>Lot: 039 Concession Name: YS E Municipality: RICHMOND HILL TOWN (MARKHAM) Northing Nad83: 4856023 Utm Reliability: margin of error : 100 m - 300 m Construction Date: 5/15/1951 Well Depth: 179 ft</p> <p>Static Water Level: Clear/Cloudy: Final Well Status: Test Hole Flowing (y/n): Elevation Reliability: Overburden/Bedrock: Mixed in a Layer Casing Material:</p> <p>Original Depth: 2 ft Material: TOPSOIL</p> <p>Original Depth: 12 ft Material: CLAY, BOULDERS</p> <p>Original Depth: 17 ft Material: CLAY, FINE SAND</p> <p>Original Depth: 74 ft Material: CLAY, BOULDERS, MEDIUM SAND</p> <p>Original Depth: 142 ft Material: CLAY, BOULDERS</p> <p>Original Depth: 164 ft Material: CLAY, MEDIUM SAND, SILT</p> <p>Original Depth: 172 ft Material: CLAY</p> <p>Original Depth: 178 ft Material: CLAY, SHALE</p> <p>Original Depth: 179 ft Material: SHALE</p>					

Map Key	Number of Records	Elevation m	Site	DB
2	1 of 1	196.9	ON	BORE
<p>Borehole ID: 866756 Type: Borehole Use: Geotechnical/Geological Investigation Status: Decommissioned Drill Method: Hollow stem auger UTM Zone: 17 Easting: 626386.000 Northing: 4855836.000 Location Accuracy: Orig. Ground Elevation(m): 204.100006 Elev. Reliability Note: DEM Ground Elevation(m): 204.300003 Total Depth(m): 11 Primary Name: Township: MARKHAM Concession: CON 1 EAST OF YONGE STREET Lot: 0 Municipality: Completion Date: 1989-DEC-21 Static Water Level: 4 Primary Water Use: Secondary Water Use: Location Description: Proposed High Density Residential Development, East of Yonge Street, North of Hwy. 7, Town of Richmond Hill. The site was carried out on property extending from Yonge Street easterly to CNR , and from Highway 7 northerly to the property line between Oak and Edgar Avenues (west of Yonge).</p> <p>--- Details --- Stratum ID: 7017906 Top Depth(m): 4 Bottom Depth(m): 9 Stratum Desc: Brown, dense to very dense, fine sand, a trace to some silt, occasional medium sand seams. + Stratum ID: 7017907 Top Depth(m): 9 Bottom Depth(m): 10.300000 Stratum Desc: Grey, dense silt, sandy , a trace of clay + Stratum ID: 7017908 Top Depth(m): 10.300000 Bottom Depth(m): 11 Stratum Desc: Grey, very dense, sandy silt, till + Stratum ID: 7017905 Top Depth(m): 0 Bottom Depth(m): 4 Stratum Desc: 35 cm Topsoil. Brown, firm to hard, silty clay, till, sandy, a trace of gravel, occasional cobbles and sand seams. Weathered</p>				
3	1 of 2	196.8	ON	WWIS
<p>Well Id: 7039589 Concession: County: YORK Easting Nad83: 626516 Zone: 17 Primary Water Use: Not Used Lot: Concession Name: Municipality: RICHMOND HILL TOWN Northing Nad83: 4855820 Utm Reliability: margin of error : 10 - 30 m Construction Date: 1/13/2007</p>				

Map Key	Number of Records	Elevation m	Site	DB
<hr/>				
Secondary Water Use:				Well Depth: 5 m
Pump Rate:				Static Water Level:
Flow Rate:				Clear/Cloudy:
Specific Capacity:				Final Well Status: Dewatering
Construction Method: Jetting				Flowing (y/n):
Elevation (m): 202.196899				Elevation Reliability:
Depth to Bedrock:				Overburden/Bedrock: Overburden
Water Type: FRESH				Casing Material: PLASTIC
--- Details ---				
Thickness: 2.5 m				Original Depth: 2.5 m
Material Colour: BROWN				Material: SILT, SANDY, TILL
+				
Thickness: 2.5 m				Original Depth: 5 m
Material Colour: GREY				Material: SAND
<hr/>				
3	2 of 2	196.8	ON	<u>WWIS</u>
Well Id: 7044664				Lot:
Concession:				Concession Name:
County: YORK				Municipality: RICHMOND HILL TOWN
Easting Nad83: 626516				Northing Nad83: 4855820
Zone: 17				Utm Reliability: margin of error : 10 - 30 m
Primary Water Use: Not Used				Construction Date: 5/28/2007
Secondary Water Use:				Well Depth: 5 m
Pump Rate:				Static Water Level:
Flow Rate:				Clear/Cloudy:
Specific Capacity:				Final Well Status: Abandoned-Other
Construction Method:				Flowing (y/n):
Elevation (m): 202.196899				Elevation Reliability:
Depth to Bedrock:				Overburden/Bedrock: Overburden
Water Type:				Casing Material:
--- Details ---				
Thickness: 2.5 m				Original Depth: 2.5 m
Material Colour: BROWN				Material: SILT, SANDY, TILL
+				
Thickness: 2.5 m				Original Depth: 5 m
Material Colour: GREY				Material: SAND, SILT, TILL
<hr/>				
4	1 of 2	196.8	ON	<u>WWIS</u>
Well Id: 6931112				Lot:
Concession:				Concession Name:
County: YORK				Municipality: RICHMOND HILL TOWN (MARKHAM)
Easting Nad83: 626517				Northing Nad83: 4855812
Zone: 17				Utm Reliability: margin of error : 10 - 30 m
Primary Water Use: Not Used				Construction Date: 12/5/2006
Secondary Water Use:				Well Depth: 5 m
Pump Rate:				Static Water Level:
Flow Rate:				Clear/Cloudy:
Specific Capacity:				Final Well Status: Dewatering
Construction Method: Rotary (Convent.)				Flowing (y/n):

Map Key	Number of Records	Elevation m	Site	DB
Elevation (m):	202.083816			
Depth to Bedrock:				
Water Type:	FRESH			
--- Details ---				
Thickness:	2.5 m		Original Depth:	2.5 m
Material Colour:	BROWN		Material:	SILT, SANDY, TILL
+				
Thickness:	2.5 m		Original Depth:	5 m
Material Colour:	GREY		Material:	SAND, SANDY, SILT

4 **2 of 2** **196.8** **RICHMOND HILL ON** [WWIS](#)

Well Id:	7044663		Lot:	
Concession:			Concession Name:	
County:	YORK		Municipality:	RICHMOND HILL TOWN
Easting Nad83:	626517		Northing Nad83:	4855812
Zone:	17		Utm Reliability:	margin of error : 10 - 30 m
Primary Water Use:	Not Used		Construction Date:	5/28/2007
Secondary Water Use:			Well Depth:	5 m
Pump Rate:			Static Water Level:	
Flow Rate:			Clear/Cloudy:	
Specific Capacity:			Final Well Status:	Abandoned-Other
Construction Method:			Flowing (y/n):	
Elevation (m):	202.083816		Elevation Reliability:	
Depth to Bedrock:			Overburden/Bedrock:	Overburden
Water Type:			Casing Material:	
--- Details ---				
Thickness:	2.5 m		Original Depth:	2.5 m
Material Colour:	BROWN		Material:	SILT, SAND, TILL
+				
Thickness:	2.5 m		Original Depth:	5 m
Material Colour:	GREY		Material:	SAND, SILT, TILL

5 **1 of 1** **197.0** **lot 38 con 1 ON** [WWIS](#)

Well Id:	6902905		Lot:	038
Concession:	01		Concession Name:	YS E
County:	YORK		Municipality:	RICHMOND HILL TOWN (MARKHAM)
Easting Nad83:	626477.7		Northing Nad83:	4855754
Zone:	17		Utm Reliability:	margin of error : 100 m - 300 m
Primary Water Use:			Construction Date:	5/8/1951
Secondary Water Use:			Well Depth:	184 ft
Pump Rate:			Static Water Level:	
Flow Rate:			Clear/Cloudy:	
Specific Capacity:			Final Well Status:	Test Hole
Construction Method:	Rotary (Convent.)		Flowing (y/n):	
Elevation (m):	201.758529		Elevation Reliability:	
Depth to Bedrock:			Overburden/Bedrock:	Overburden
Water Type:			Casing Material:	
--- Details ---				
Thickness:	1 ft		Original Depth:	1 ft

Map Key	Number of Records	Elevation m	Site	DB
Material Colour:			Material:	TOPSOIL
+				
Thickness:	3 ft		Original Depth:	4 ft
Material Colour:			Material:	CLAY, MEDIUM SAND
+				
Thickness:	13 ft		Original Depth:	17 ft
Material Colour:			Material:	FINE SAND
+				
Thickness:	25 ft		Original Depth:	42 ft
Material Colour:			Material:	CLAY, BOULDERS
+				
Thickness:	10 ft		Original Depth:	52 ft
Material Colour:			Material:	CLAY, BOULDERS, FINE SAND
+				
Thickness:	18 ft		Original Depth:	70 ft
Material Colour:			Material:	SILT, BOULDERS, FINE SAND
+				
Thickness:	18 ft		Original Depth:	88 ft
Material Colour:			Material:	FINE SAND, BOULDERS
+				
Thickness:	47 ft		Original Depth:	135 ft
Material Colour:			Material:	FINE SAND, CLAY
+				
Thickness:	27 ft		Original Depth:	162 ft
Material Colour:			Material:	BOULDERS, CLAY, MEDIUM SAND
+				
Thickness:	22 ft		Original Depth:	184 ft
Material Colour:	BLUE		Material:	CLAY, BOULDERS, FINE SAND

6 **1 of 1** **199.3** **KING WILLIAM CRESCENT & RED MAPLE ROAD** **HINC**
RICHMOND HILL ON

External File Num: FS INC 0612-04485
Date of Occurrence: 11/9/2006
Fuel Occurrence Type: Pipeline Strike
Fuel Type Involved: Natural Gas
Status Desc: Completed - Causal Analysis(End)
Job Type Desc: Incident/Near-Miss Occurrence (FS)
Oper. Type Involved: Construction Site (pipeline strike)
Service Interruptions: No
Property Damage: Yes
Fuel Life Cycle Stage: Transmission, Distribution and Transportation
Root Cause: Root Cause: Equipment/Material/Component:No Procedures:Yes Maintenance:No Design:No
Training:No Management:No Human Factors:Yes

Reported Details:
Fuel Category: Gaseous Fuel
Occurrence Type: Incident
Affiliation: Industry Stakeholder (Licensee/Registration/Certificate Holder, Facility Owner, etc.)
County Name: York
Approx. Quant. Rel:
Nearby body of water:
Enter Drainage Syst.:
Approx. Quant. Unit:
Environmental Impact:

Map Key	Number of Records	Elevation m	Site	DB
7	1 of 1	196.8	ON	BORE
<p>Borehole ID: 866753 Type: Borehole Use: Geotechnical/Geological Investigation Status: Decommissioned Drill Method: Hollow stem auger UTM Zone: 17 Easting: 626149.000 Northing: 4855790.000 Location Accuracy: Orig. Ground Elevation(m): 201 Elev. Reliability Note: DEM Ground Elevation(m): 202.300003 Total Depth(m): 8.100000 Primary Name: Township: MARKHAM Concession: CON 1 EAST OF YONGE STREET Lot: 0 Municipality: Completion Date: 1989-DEC-21 Static Water Level: 4.500000 Primary Water Use: Secondary Water Use: Location Description: Proposed High Density Residential Development, East of Yonge Street, North of Hwy. 7, Town of Richmond Hill. The site was carried out on property extending from Yonge Street easterly to CNR , and from Highway 7 northerly to the property line between Oak and Edgar Avenues (west of Yonge).</p> <p>--- Details --- Stratum ID: 7017898 Top Depth(m): 0 Bottom Depth(m): 4 Stratum Desc: 35cm Topsoil. Brown, stiff to hard, silty clay , till, sandy, a trace of gravel, occasional cobbles and wet sand seams</p> <p>+ Stratum ID: 7017899 Top Depth(m): 4 Bottom Depth(m): 8.100000 Stratum Desc: Brown, dense, fine sand, a trace to some silt, occasional medium sand layers</p>				
8	1 of 1	197.3	lot 38 con 1 ON	WWIS
<p>Well Id: 6906180 Concession: 01 County: YORK Easting Nad83: 626435.7 Zone: 17 Primary Water Use: Domestic Secondary Water Use: Pump Rate: 4 GPM Flow Rate: Specific Capacity: Construction Method: Jetting Elevation (m): 201.072906 Depth to Bedrock: Water Type: FRESH</p> <p>Lot: 038 Concession Name: YS W Municipality: RICHMOND HILL TOWN (VAUGHAN) Northing Nad83: 4855674 Utm Reliability: unknown UTM Construction Date: 4/4/1952 Well Depth: 101 ft Static Water Level: 56 ft Clear/Cloudy: CLEAR Final Well Status: Water Supply Flowing (y/n): N Elevation Reliability: Overburden/Bedrock: Overburden Casing Material: STEEL</p>				

Map Key	Number of Records	Elevation m	Site	DB
--- Details ---				
Thickness:	18 ft		Original Depth:	18 ft
Material Colour:	BROWN		Material:	CLAY
+				
Thickness:	10 ft		Original Depth:	28 ft
Material Colour:			Material:	QUICKSAND
+				
Thickness:	47 ft		Original Depth:	75 ft
Material Colour:	BLUE		Material:	CLAY
+				
Thickness:	11 ft		Original Depth:	86 ft
Material Colour:			Material:	HARDPAN, GRAVEL
+				
Thickness:	9 ft		Original Depth:	95 ft
Material Colour:	BLUE		Material:	CLAY
+				
Thickness:	2 ft		Original Depth:	97 ft
Material Colour:			Material:	HARDPAN, GRAVEL
+				
Thickness:	4 ft		Original Depth:	101 ft
Material Colour:			Material:	GRAVEL

9 **1 of 2** **196.8** **SHOPPERS DRUG MART #1179 F. LO PHARMACY LTD.** **[PES](#)**
8865 YONGE ST, UNIT #1
RICHMOND HILL ON L4C 6Z1

Licence No.:
Licence Type: Limited Vendor

9 **2 of 2** **196.8** **SHOPPERS DRUG MART #1179 F. LO PHARMACY LTD.** **[PES](#)**
8865 YONGE ST, UNIT #1
RICHMOND HILL ON L4C 6Z1

Licence No.:
Licence Type: Vendor

10 **1 of 1** **198.2** **Lums Indus Supply Uniform-Med** **[SCT](#)**
9043 Yonge St
Richmond Hill ON L4C 0L2

Established:
Plant Size (ft²):
Employment:

--- Details ---
SIC/NAICS Code: 419120
Description: Wholesale Trade Agents and Brokers
+
SIC/NAICS Code: 812330
Description: Linen and Uniform Supply
+
SIC/NAICS Code: 414330

Map Key	Number of Records	Elevation m	Site	DB
<i>Description:</i>		Linen, Drapery and Other Textile Furnishings Wholesaler-Distributors		
+				
<i>SIC/NAICS Code:</i>		417930		
<i>Description:</i>		Professional Machinery, Equipment and Supplies Wholesaler-Distributors		
+				
<i>SIC/NAICS Code:</i>		414110		
<i>Description:</i>		Clothing and Clothing Accessories Wholesaler-Distributors		
+				
<i>SIC/NAICS Code:</i>		417920		
<i>Description:</i>		Service Establishment Machinery, Equipment and Supplies Wholesaler-Distributors		
+				
<i>SIC/NAICS Code:</i>		812330		
<i>Description:</i>		Linen and Uniform Supply		
+				
<i>SIC/NAICS Code:</i>		418990		
<i>Description:</i>		All Other Wholesaler-Distributors		

11 **1 of 1** **199.0** **ON** **BORE**

Borehole ID: 866754
Type: Borehole
Use: Geotechnical/Geological Investigation
Status: Decommissioned
Drill Method: Hollow stem auger
UTM Zone: 17
Easting: 626071.000
Northing: 4856222.000
Location Accuracy:
Orig. Ground Elevation(m): 206
Elev. Reliability Note:
DEM Ground Elevation(m): 206.100006
Total Depth(m): 8.100000
Primary Name:
Township: MARKHAM
Concession: CON 1 EAST OF YONGE STREET
Lot: 0
Municipality:
Completion Date: 1989-DEC-21
Static Water Level: 13.400000
Primary Water Use:
Secondary Water Use:
Location Description: Proposed High Density Residential Development, East of Yonge Street, North of Hwy. 7, Town of Richmond Hill. The site was carried out on property extending from Yonge Street easterly to CNR , and from Highway 7 northerly to the property line between Oak and Edgar Avenues (west of Yonge).

--- Details ---

Stratum ID: 7017900
Top Depth(m): 0
Bottom Depth(m): 5.600000
Stratum Desc: 50 cm topsoil. Brown, stiff to hard, silty clay, till, sandy, a trace of gravel, occasional cobbles, boulders and wet sand seams. Brown to grey.

+

Stratum ID: 7017901
Top Depth(m): 5.600000
Bottom Depth(m): 8.100000
Stratum Desc: Grey, dense silt, a trace of sand to sandy, occasional clay layers.

12 **1 of 1** **196.8** **8783, 8851 & 8889 Yonge St
Richmond Hill ON** **EHS**

Map Key	Number of Records	Elevation m	Site	DB
Order No.:		20040114010		
Report Date:		1/23/04		
Report Type:		Basic Report		
Search Radius (km):		0.50		
Addit. Info Ordered:				

13	1 of 1	196.8	lot 37 con 1 ON	WWIS
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Well Id:	6902904	Lot:	037
Concession:	01	Concession Name:	YS E
County:	YORK	Municipality:	RICHMOND HILL TOWN (MARKHAM)
Easting Nad83:	626236.7	Northing Nad83:	4855551
Zone:	17	Utm Reliability:	margin of error : 100 m - 300 m
Primary Water Use:	Domestic	Construction Date:	9/30/1954
Secondary Water Use:		Well Depth:	91 ft
Pump Rate:	10 GPM	Static Water Level:	35 ft
Flow Rate:		Clear/Cloudy:	CLEAR
Specific Capacity:		Final Well Status:	Water Supply
Construction Method:	Cable Tool	Flowing (y/n):	N
Elevation (m):	201.106658	Elevation Reliability:	
Depth to Bedrock:		Overburden/Bedrock:	Overburden
Water Type:	FRESH	Casing Material:	STEEL

--- Details ---

Thickness:	3 ft	Original Depth:	3 ft
Material Colour:		Material:	FILL
+			
Thickness:	2 ft	Original Depth:	5 ft
Material Colour:		Material:	TOPSOIL
+			
Thickness:	20 ft	Original Depth:	25 ft
Material Colour:	YELLOW	Material:	CLAY
+			
Thickness:	13 ft	Original Depth:	38 ft
Material Colour:	YELLOW	Material:	CLAY, MEDIUM SAND
+			
Thickness:	42 ft	Original Depth:	80 ft
Material Colour:	BLUE	Material:	CLAY
+			
Thickness:	11 ft	Original Depth:	91 ft
Material Colour:	BLUE	Material:	MEDIUM SAND

14	1 of 1	197.1	ON	BORE
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Borehole ID:	866755
Type:	Borehole
Use:	Geotechnical/Geological Investigation
Status:	Decommissioned
Drill Method:	Hollow stem auger
UTM Zone:	17
Easting:	626522.000
Northing:	4855562.000

Map Key	Number of Records	Elevation m	Site	DB
<i>Location Accuracy:</i>				
<i>Orig. Ground Elevation(m):</i>		201		
<i>Elev. Reliability Note:</i>				
<i>DEM Ground Elevation(m):</i>		201.600006		
<i>Total Depth(m):</i>		11		
<i>Primary Name:</i>				
<i>Township:</i>		MARKHAM		
<i>Concession:</i>		CON 1 EAST OF YONGE STREET		
<i>Lot:</i>		0		
<i>Municipality:</i>				
<i>Completion Date:</i>		1989-DEC-20		
<i>Static Water Level:</i>		4.400000		
<i>Primary Water Use:</i>				
<i>Secondary Water Use:</i>				
<i>Location Description:</i>		Proposed High Density Residential Development, East of Yonge Street, North of Hwy. 7, Town of Richmond Hill. The site was carried out on property extending from Yonge Street easterly to CNR , and from Highway 7 northerly to the property line between Oak and Edgar Avenues (west of Yonge).		
--- Details ---				
<i>Stratum ID:</i>		7017902		
<i>Top Depth(m):</i>		0		
<i>Bottom Depth(m):</i>		2.900000		
<i>Stratum Desc:</i>		30 cm Topsoil. Brown, weathered, stiff to firm, silty clay, till, sandy, a trace of gravel		
+				
<i>Stratum ID:</i>		7017903		
<i>Top Depth(m):</i>		2.900000		
<i>Bottom Depth(m):</i>		7.500000		
<i>Stratum Desc:</i>		Brown, compact to dense, fine sand, silt to a trace of silt, occasional medium sand seams		
+				
<i>Stratum ID:</i>		7017904		
<i>Top Depth(m):</i>		7.500000		
<i>Bottom Depth(m):</i>		11		
<i>Stratum Desc:</i>		Grey, hard, silty clay, till, sandy, a trace of gravel, occasional cobbles, boulders and wet sand seams		

15	1 of 1	197.1	39 ONEIDA CRESCENT RICHMOND HILL ON	<u>HINC</u>
<i>External File Num:</i> FS INC 0901-00307				
<i>Date of Occurrence:</i> 1/17/2009				
<i>Fuel Occurrence Type:</i> CO Release				
<i>Fuel Type Involved:</i> Natural Gas				
<i>Status Desc:</i> Completed - Causal Analysis(End)				
<i>Job Type Desc:</i> Incident/Near-Miss Occurrence (FS)				
<i>Oper. Type Involved:</i> Multi-unit Residential				
<i>Service Interruptions:</i> No				
<i>Property Damage:</i> No				
<i>Fuel Life Cycle Stage:</i> Utilization				
<i>Root Cause:</i> Root Cause: Equipment/Material/Component:No Procedures:No Maintenance:No Design:No Training:No Management:No Human Factors:No E				
<i>Reported Details:</i>				
<i>Fuel Category:</i> Gaseous Fuel				
<i>Occurrence Type:</i> Incident				
<i>Affiliation:</i> Industry Stakeholder (Licensee/Registration/Certificate Holder, Facility Owner, etc.)				
<i>County Name:</i> York				
<i>Approx. Quant. Rel:</i>				
<i>Nearby body of water:</i>				
<i>Enter Drainage Syst.:</i>				
<i>Approx. Quant. Unit:</i>				
<i>Environmental Impact:</i>				

Map Key	Number of Records	Elevation m	Site	DB
16	1 of 1	201.9	1671133 Ontario Inc. Richmond Hill, ON	RSC
<i>Date Submitted:</i>		10-Apr-06		
<i>Date Acknowledg.:</i>				
<i>Date Returned:</i>				
<i>Certification Date:</i>		22-Dec-05		
<i>Soil Type:</i>				
<i>Restoration Type:</i>				
<i>Registration #:</i>		2397		
<i>Stratified (Y/N):</i>				
<i>Criteria:</i>				
<i>Consultant:</i>				
<i>District Office:</i>		RICHMOND HILL		
<i>Intended Prop Use:</i>		Commercial		
<i>Current Property Use:</i>		Industrial		
<i>Certificate Prop Use #:</i>		No CPU		
<i>Applicable Standards:</i>		Full Depth Site Conditions Standard, with Nonpotable Ground Water, Medium/Fine Textured Soil, for Industrial/Commercial/Community property use		
<i>Legal Description:</i>		PT LT 11, PL 3806 Markham, as in MA41421, except PTS 3 & 4 EXPROP PL R562043; PT LT 5, PL 3805 Markham; PT LT 6, PL 3805 Markham, as in RH49194, except PT 6 EXPROP PL R562043; Richmond Hill.		
<i>Prop. Identification #:</i>		03109-0018(LT), Town of Richmond Hill		
<i>Entire legal prop. (y/n):</i>		Yes		
<i>UTM Coordinates:</i>		NAD83 17-626200-4856500		
<i>Latitude & Longitude:</i>		43.85080130N 79.42986330W (converted from UTM)		
<i>Accuracy Estimate:</i>		11 to 20 meters		
<i>Measurement Method:</i>		Interpolation from a map		
<i>CPU Issued Sect 1686:</i>		No		
17	1 of 6	197.8	50 High Tech Road Richmond Hill ON L4B 4N7	CA
<i>Certificate #:</i>		4582-557KT4		
<i>Application Year:</i>		02		
<i>Issue Date:</i>		1/16/02		
<i>Approval Type:</i>		Industrial air		
<i>Status:</i>		Revoked and/or Replaced		
<i>Application Type:</i>		New Certificate of Approval		
<i>Client Name:</i>		The Corporation of the Regional Municipality of York		
<i>Client Address:</i>		17250 Yonge Street, P.O. Box 147		
<i>Client City:</i>		Newmarket		
<i>Client Postal Code:</i>		L3Y 6Z1		
<i>Project Description:</i>		This application is for a Certificate of Approval for HVAC units, evaporative cooler, boiler and generator for the purpose of comfort heating, air conditioning and emergency power for the facility.		
<i>Contaminants:</i>				
<i>Emission Control:</i>				
17	2 of 6	197.8	50 High Tech Road Richmond Hill ON L4B 4N7	CA
<i>Certificate #:</i>		6860-56AR6J		
<i>Application Year:</i>		02		
<i>Issue Date:</i>		1/16/02		
<i>Approval Type:</i>		Industrial air		
<i>Status:</i>		Approved		
<i>Application Type:</i>		Amended CofA		
<i>Client Name:</i>		The Corporation of the Regional Municipality of York		

Map Key	Number of Records	Elevation m	Site	DB
<p>Client Address: 17250 Yonge Street, P.O. Box 147 Client City: Newmarket Client Postal Code: L3Y 6Z1 Project Description: Amendment to Revise the Diesel Generator Exhaust Flue Size to 300mm instead of 200mm. Contaminants: Emission Control:</p>				
17	3 of 6	197.8	50 High Tech Rd. Richmond Hill ON L4B 4N7	EHS
<p>Order No.: 20010828004 Report Date: 8/30/01 Report Type: Basic Report Search Radius (km): 0.25 Addit. Info Ordered:</p>				
17	4 of 6	197.8	YORK, THE REGIONAL MUNICIPALITY OF 50 High Tech Road 2nd Floor Richmond Hill ON L4B 4N7	GEN
<p>SIC Code: 621494 SIC Description: Community Health Centres Generator #: ON7340765 Approval Yrs: 02,03,04,05,06,07,08</p> <p>--- Details --- Waste Code: 148 Waste Description: INORGANIC LABORATORY CHEMICALS + Waste Code: 264 Waste Description: PHOTOPROCESSING WASTES + Waste Code: 312 Waste Description: PATHOLOGICAL WASTES</p>				
17	5 of 6	197.8	YORK, THE REGIONAL MUNICIPALITY OF HEALTH SERVICE 50 High Tech Road 2nd Floor Richmond Hill ON L4B 4N7	GEN
<p>SIC Code: SIC Description: Generator #: ON7340765 Approval Yrs: As of Apr 2012</p> <p>--- Details --- Waste Code: 148 Waste Description: Misc. wastes and inorganic chemicals + Waste Code: 312 Waste Description: Pathological wastes</p>				
17	6 of 6	197.8	YORK, THE REGIONAL MUNICIPALITY OF 50 High Tech Road 2nd Floor Richmond Hill ON L4B 4N7	GEN
<p>SIC Code: 621494 SIC Description: Community Health Centres</p>				

Map Key **Number of** **Elevation** **Site** **DB**
Records **m**

Generator #: ON7340765
Approval Yrs: 2009

--- Details ---

Waste Code: 148
Waste Description: INORGANIC LABORATORY CHEMICALS

+
Waste Code: 264
Waste Description: PHOTOPROCESSING WASTES

+
Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Unplottable Report

Site: **YONGE BAYVIEW HOLDINGS INC.**
BAYVIEW GLEN PH.4N/BANTRY AVE. RICHMOND HILL TOWN ON

Database:
CA

Certificate #: 3-1305-97-
Application Year: 97
Issue Date: 8/7/1998
Approval Type: Municipal sewage
Status:
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: **Yonge Bayview Holdings Inc.**
Lot 37, Concession 1 Richmond Hill ON

Database:
CA

Certificate #: 6777-5NFPZQ
Application Year: 2003
Issue Date: 6/13/2003
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: **Bayview Glen Community**
Part of Lots 38 & 39, Concession 1 Richmond Hill ON

Database:
CA

Certificate #: 2887-4JJRPV
Application Year: 00
Issue Date: 4/28/00
Approval Type: Municipal & Private sewage
Status: Approved
Application Type: New Certificate of Approval
Client Name: Yonge Bayview Holdings Inc.
Client Address: 1700 Langstaff Road, Suite #2003
Client City: Concord
Client Postal Code: L4K 3S3
Project Description: Installation of storm and sanitary sewers on Fundy Street/Melville Street to serve the Bayview Glen Community, Phase 4.
Contaminants:
Emission Control:

Site: Bayview Glen Community
Part of Lots 38 & 39, Concession 1 Richmond Hill ON

Database:
CA

Certificate #: 8477-4JJS73
Application Year: 00
Issue Date: 4/28/00
Approval Type: Municipal & Private water
Status: Approved
Application Type: New Certificate of Approval
Client Name: Yonge Bayview Holdings Inc.
Client Address: 1700 Langstaff Road, Suite #2003
Client City: Concord
Client Postal Code: L4K 3S3
Project Description: This application is for installation of watermains on Quetico Drive, from Silver Linden Drive, to Melville Street
Contaminants:
Emission Control:

Site: Bayview Glen
Lot 37, Concession 1 Richmond Hill ON

Database:
CA

Certificate #: 7252-56AJMZ
Application Year: 02
Issue Date: 1/15/02
Approval Type: Municipal & Private water
Status: Approved
Application Type: New Certificate of Approval
Client Name: Yonge Bayview Holdings Inc.
Client Address: 1700 Langstaff Road, Suite #2003
Client City: Concord
Client Postal Code: L4K 3S3
Project Description: This application is for approval to install watermains on Oneida Crescent
Contaminants:
Emission Control:

Site: Bayview Glen
Lot 37, Concession 1 Richmond Hill ON

Database:
CA

Issue Date: 1/15/02
Certificate #: 8342-56AK7X
Application Year: 02
Approval Type: Municipal & Private sewage
Status: Approved
Application Type: New Certificate of Approval
Client Name: Yonge Bayview Holdings Inc.
Client Address: 1700 Langstaff Road, Suite #2003
Client City: Concord
Client Postal Code: L4K 3S3
Project Description: This application is for approval to install sanitary and storm sewers on Oneida Crescent
Contaminants:
Emission Control:

Site: Lot 38, Concession 1 Richmond Hill ON

Database:
CA

Issue Date: 10/30/00
Certificate #: 1515-4QHTU3

Application Year: 00
Approval Type: Municipal & Private sewage
Status: Approved
Application Type: New Certificate of Approval
Client Name: The Block 10 Properties Inc.
Client Address: 7501 Keele Street
Client City: Vaughan
Client Postal Code: K4K 1Y2
Project Description: sanitary sewer construction on the Easement west of Bathurst St. to east of Bathurst st.
Contaminants:
Emission Control:

Site: **YONGE BAYVIEW HOLDINGS INC.**
BAYVIEW GLEN PH.4N/BANTRY AVE. RICHMOND HILL TOWN ON

Database:
CA

Issue Date: 8/7/1998
Certificate #: 7-0983-97-
Application Year: 97
Approval Type: Municipal water
Status:
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: **Yonge St, Beresford Dr & Hitech Rd Richmond Hill ON**

Database:
EHS

Order No.: 20010531012
Report Date: 6/11/01
Report Type: Basic Report
Search Radius (km): 0.25
Addit. Info Ordered:

Site: **RED MAPLE DRIVE RICHMOND HILL ON**

Database:
HINC

External File Num: FS INC 0706-02727
Date of Occurrence: 6/5/2007
Fuel Occurrence Type: Pipeline Strike
Fuel Type Involved: Natural Gas
Status Desc: Completed - Causal Analysis(End)
Job Type Desc: Incident/Near-Miss Occurrence (FS)
Oper. Type Involved: Multi-unit Residential
Service Interruptions: Yes
Property Damage: Yes
Fuel Life Cycle Stage: Utilization
Root Cause: Root Cause: Equipment/Material/Component:No Procedures:Yes Maintenance:No
Design:No Training:No Management:No Human Factors:Yes
Reported Details:
Fuel Category: Gaseous Fuel
Occurrence Type: Incident
Affiliation: Industry Stakeholder (Licensee/Registration/Certificate Holder, Facility Owner, etc.)
County Name: York
Approx. Quant. Rel:

Nearby body of water:
Enter Drainage Syst.:
Approx. Quant. Unit:
Environmental Impact:

Site: **The Corporation of the Town of Richmond Hill**
Oneida Cr (North Branch, 50 ft from Red Maple Rd) Richmond Hill ON

Database:
SPL

Ref No.: 6302-82ES5R
Incident Dt:
MOE Reported Dt: 2/6/2010
Contaminant Name: SEWAGE,RAW UNCHLORINATED
Contaminant Quantity: 0 other - see incident description
Incident Summary: Richmond Hill Works: surging sanitary manhole, ongoing
Incident Cause: Other Discharges
Incident Reason: Other - Reason not otherwise defined
Nature of Impact: Soil Contamination
Receiving Medium:
Environmental Impact: Possible

Site: **Enbridge Gas Distribution Inc.**
Red Maple Dr Richmond Hill ON

Database:
SPL

Ref No.: 8736-73VJUS
Incident Dt:
MOE Reported Dt: 6/5/2007
Contaminant Name: NATURAL GAS (METHANE)
Contaminant Quantity: 0 other - see incident description
Incident Summary: Enbridge: 4-inch gas line strike, Red Maple Drive
Incident Cause: Discharge or Emission to Air
Incident Reason: Error- Operator error
Nature of Impact: Air Pollution
Receiving Medium: Air
Environmental Impact: Not Anticipated

Site:
ON

Database:
WWIS

County:	YORK	Municipality:	RICHMOND HILL TOWN (KING)
Well Id:	6924787	Lot:	
Concession:	01	Concession	YS W
Easting Nad83:		Name:	
Zone:	17	Northing	
Primary Water Use:	Not Used	Nad83:	
Secondary Water Use:		Utm Reliability:	unknown UTM
Pump Rate:		Construction	2/27/1998
Flow Rate:		Date:	
Specific Capacity:		Well Depth:	43 ft
Construction Method:	Not Known	Static Water Level:	
Elevation (m):		Clear/Cloudy:	
Depth to Bedrock:	4	Final Well Status:	Abandoned-Other
		Flowing (y/n):	
		Elevation	
		Reliability:	
		Overburden/Bedrock:	Overburden below Bedrock

Water Type:

Casing
Material:

--- Details ---

Thickness: 4 ft
Material Colour: BROWN

Original Depth: 4 ft
Material: CLAY, FILL

+
Thickness: 6 ft
Material Colour:

Original Depth: 10 ft
Material: LIMESTONE, GRAVEL

+
Thickness: 5 ft
Material Colour:

Original Depth: 15 ft
Material: GRANITE

+
Thickness: 14 ft
Material Colour:

Original Depth: 29 ft
Material: LIMESTONE, GRAVEL

+
Thickness: 1 ft
Material Colour:

Original Depth: 30 ft
Material: SAND, CEMENTED

+
Thickness: 4 ft
Material Colour:

Original Depth: 34 ft
Material: GRANITE

+
Thickness: 6 ft
Material Colour:

Original Depth: 40 ft
Material: GRAVEL, LIMESTONE, GRANITE

+
Thickness: 3 ft
Material Colour:

Original Depth: 43 ft
Material: GRANITE

Site:

RICHMOND HILL TOWN (MARKHAM) ON

**Database:
WWIS**

Well Id: 6928731
Concession: 01

Lot:
Concession
Name:

County: YORK
Easting Nad83:

Municipality: RICHMOND HILL TOWN (MARKHAM)
Northing
Nad83:

Zone:
Primary Water Use: Not Used

Utm Reliability:
Construction Date: 12/30/2004

Secondary Water
Use:

Well Depth: 109.90814

Pump Rate:

Static Water
Level:

Flow Rate:
Specific Capacity:

Clear/Cloudy:
Final Well Status: Test Hole

Construction Method: Rotary (Convent.)
Elevation (m):

Flowing (y/n):
Elevation

Depth to Bedrock:

Reliability:
Overburden/Bedrock: Overburden

Water Type:

Casing Material: STEEL

--- Details ---

Thickness: 49.868768
Material Colour: BROWN

Original Depth: 49.868768
Material: CLAY, GRAVEL

+
Thickness: 13.12336
Material Colour: BROWN

Original Depth: 62.992128
Material: FINE SAND, CLAY

+
Thickness: 3.0183728
Material Colour: GREY

Original Depth: 66.0105008
Material: CLAY

+	Thickness:	5.8398952	Original Depth:	71.850396
	Material Colour:	BROWN	Material:	FINE SAND, SILT, CLAY
+	Thickness:	5.905512	Original Depth:	77.755908
	Material Colour:	BROWN	Material:	COARSE SAND, GRAVEL
+	Thickness:	21.981628	Original Depth:	99.737536
	Material Colour:	BROWN	Material:	FINE SAND, SILT, CLAY
+	Thickness:	3.28084	Original Depth:	103.018376
	Material Colour:	BROWN	Material:	COARSE SAND
+	Thickness:	6.889764	Original Depth:	109.90814
	Material Colour:	BROWN	Material:	FINE SAND

Site: ON **Database:** WWIS

Well Id:	1522949	Lot:	039
Concession:		Concession Name:	
County:	OTTAWA-CARLETON	Municipality:	RICHMOND VILLAGE
Easting Nad83:		Northing Nad83:	
Zone:	18	Utm Reliability:	unknown UTM
Primary Water Use:	Domestic	Construction Date:	3/11/1988
Secondary Water Use:		Well Depth:	84 ft
Pump Rate:	8 GPM	Static Water Level:	8 ft
Flow Rate:		Clear/Cloudy:	CLOUDY
Specific Capacity:		Final Well Status:	Water Supply
Construction Method:	Air Percussion	Flowing (y/n):	N
Elevation (m):		Elevation Reliability:	
Depth to Bedrock:	23	Overburden/Bedrock:	Bedrock
Water Type:	FRESH	Casing Material:	STEEL, OPEN HOLE

--- Details ---

Thickness:	23 ft	Original Depth:	23 ft
Material Colour:	GREY	Material:	CLAY
+	Thickness:	61 ft	Original Depth:
	Material Colour:	GREY	Material:
			84 ft
			LIMESTONE

Site: ON **Database:** WWIS

County:	YORK	Municipality:	RICHMOND HILL TOWN (KING)
Well Id:	6925762	Lot:	
Concession:	01	Concession Name:	YS W
Easting Nad83:		Northing Nad83:	
Zone:	17	Utm Reliability:	unknown UTM
Primary Water Use:	Not Used	Construction Date:	10/9/2000
Secondary Water Use:		Well Depth:	

Use:		Static Water	
Pump Rate:		Level:	
Flow Rate:		Clear/Cloudy:	
Specific Capacity:		Final Well	Abandoned-Other
Construction Method:	Other Method	Status:	
Elevation (m):		Flowing (y/n):	
Depth to Bedrock:		Elevation	
Water Type:		Reliability:	
		Overburden/Bedrock:	No formation data
		Casing	
		Material:	

Site: **ON** **Database:**
WWIS

Well Id:	3701961	Lot:	038
Concession:	01	Concession	CON
County:	LENNOX & ADDINGTON	Name:	
Easting Nad83:		Municipality:	RICHMOND TOWNSHIP
Zone:	18	Northing	
Primary Water Use:	Livestock	Nad83:	
Secondary Water Use:		Utm Reliability:	unknown UTM
Pump Rate:		Construction	5/4/1947
Flow Rate:		Date:	
Specific Capacity:		Well Depth:	216 ft
Construction Method:	Cable Tool	Static Water	30 ft
Elevation (m):		Level:	
Depth to Bedrock:	5	Clear/Cloudy:	CLEAR
Water Type:	SALTY	Final Well	Water Supply
		Status:	
		Flowing (y/n):	N
		Elevation	
		Reliability:	
		Overburden/Bedrock:	Bedrock
		Casing	STEEL, OPEN HOLE
		Material:	

--- Details ---

Thickness:	5 ft	Original Depth:	5 ft
Material Colour:		Material:	TOPSOIL, CLAY
+			
Thickness:	171 ft	Original Depth:	176 ft
Material Colour:		Material:	LIMESTONE
+			
Thickness:	10 ft	Original Depth:	186 ft
Material Colour:	BROWN	Material:	SHALE
+			
Thickness:	15 ft	Original Depth:	201 ft
Material Colour:	GREEN	Material:	GRANITE
+			
Thickness:	15 ft	Original Depth:	216 ft
Material Colour:	RED	Material:	GRANITE

Site: **ON** **Database:**
WWIS

Well Id:	6925700	Lot:	
Concession:	01	Concession	YS E

County: YORK
Easting Nad83:

Zone: 17
Primary Water Use: Not Used

Secondary Water Use:
Pump Rate:

Flow Rate:
Specific Capacity:

Construction Method: Digging
Elevation (m):

Depth to Bedrock:

Water Type:

Name:
Municipality: RICHMOND HILL TOWN (MARKHAM)
Northing
Nad83:
Utm Reliability: unknown UTM
Construction Date: 12/1/2000
Well Depth:

Static Water Level:
Clear/Cloudy:
Final Well Status: Abandoned-Other
Flowing (y/n):
Elevation
Reliability:
Overburden/Bedrock: No formation data
Casing
Material:

Appendix: Database Descriptions

Ecolog Environmental Risk Information Services Ltd can search the following databases. The extent of Historical information varies with each database and current information is determined by what is publicly available to Ecolog ERIS at the time of update. **Note:** Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.

Abandoned Aggregate Inventory: Up to Sept 2002 Provincial [AAGR](#)
The MAAP Program maintains a database of all abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.

Aggregate Inventory: Up to Aug 2012 Provincial [AGR](#)
The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. Please note that the database is only referenced by lot\concession and city/town location. The database provides information regarding the registered owner/operator, location, status, licence type, and maximum tonnage.

Abandoned Mine Information System: 1800-Jan 2012 Provincial [AMIS](#)
The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Anderson's Waste Disposal Sites: 1860s-Present Private [ANDR](#)
The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Automobile Wrecking & Supplies: 2001-Jun 2010 Private [AUWR](#)
This database provides an inventory of all known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Borehole: 1875-Aug 2011 Provincial [BORE](#)
A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Certificates of Approval:

1985-Oct 30, 2011*

Provincial

[CA](#)

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Commercial Fuel Oil Tanks:

1948-Aug 2011

Provincial

[CFOT](#)

Since May 2002, Ontario developed a new act where it became mandatory for fuel oil tanks to be registered with Technical Standards & Safety Authority (TSSA). This data would include all commercial underground fuel oil tanks in Ontario with fields such as location, registration number, tank material, age of tank and tank size.

Chemical Register:

1992, 1999-Jun 2010

Private

[CHEM](#)

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Inventory of Coal Gasification Plants and Coal Tar

Apr 1987 and Nov 1988*

Provincial

[COAL](#)**Sites:**

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Compliance and Convictions:

1989-Feb 2013

Provincial

[CONV](#)

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Certificates of Property Use:

1994-Feb 2013

Provincial

[CPU](#)

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Drill Hole Database:

1886-Oct 2011

Provincial

[DRL](#)

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Environmental Activity and Sector Registry:

Oct 31, 2011-Feb 2013

Provincial

[EASR](#)

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Environmental Registry:

1994-Feb 2013

Provincial

[EBR](#)

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Environmental Compliance Approval:

Oct 31, 2011-Feb 2013

Provincial

[ECA](#)

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For CofA's prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Environmental Effects Monitoring:

1992-2007*

Federal

[EEM](#)

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

ERIS Historical Searches:

1999-Oct 2012

Private

[EHS](#)

EcoLog ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Environmental Issues Inventory System:

1992-2001*

Federal

[EIS](#)

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

List of TSSA Expired Facilities:

Current to Feb 2012

Provincial

[EXP](#)

This is a list of all expired facilities that fall under the TSSA (TSSA Act & Safety Regulations), including the six regulations that exist under the Fuels Safety Division. It will include facilities such as private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc. These tanks have been removed and automatically fall under the expired facilities inventory held by TSSA.

Federal Convictions:

1988-Jun 2007

Federal

[FCON](#)

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Contaminated Sites on Federal Land:

June 2000-Jan 2013

Federal

[FCS](#)

The Federal Contaminated Sites Inventory includes information on all known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

Fisheries & Oceans Fuel Tanks:

1964-Sept 2003

Federal

[FOFT](#)

Fisheries & Oceans Canada maintains an inventory of all aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Fuel Storage Tank:

Current to Jun 2011

Provincial

[FST](#)

The Technical Standards & Safety Authority (TSSA), under the Technical Standards & Safety Act of 2000 maintains a database of registered private and retail fuel storage tanks in Ontario with fields such as location, tank status, license date, tank type, tank capacity, fuel type, installation year and facility type.

Ontario Regulation 347 Waste Generators Summary:

1986-Apr 2012

Provincial

[GEN](#)

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

TSSA Historic Incidents:

2006-June 2009

Provincial

[HINC](#)

This database will cover all incidences recorded by TSSA with their older system, before they moved to their new management system. TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. The TSSA works to protect the public, the environment and property from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from pipelines, diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

Indian & Northern Affairs Fuel Tanks:

1950-Aug 2003

Federal

[IAFT](#)

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of all aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

TSSA Incidents:

June 2009-Mar 2012

Provincial

[INC](#)

TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Includes incidents from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

Landfill Inventory Management Ontario:

2010

Provincial

[LIMO](#)

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the ministry compiles new and updated information. The inventory will include small and large landfills. Additionally, each year the ministry will request operators of the larger landfills complete a landfill data collection form that will be used to update LIMO and will include the following information from the previous operating year. This will include additional information such as estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills will include information such as site owner, site location and certificate of approval # and status.

Canadian Mine Locations:

1998-2009

Private

[MINE](#)

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Mineral Occurrences:

1846-Nov 2011

Provincial

[MNR](#)

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the planimetric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

National Analysis of Trends in Emergencies System

1974-1994*

Federal

[NATE](#)**(NATES):**

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Non-Compliance Reports:

1992(water only), 1994-2010

Provincial

[NCPL](#)

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

<u>National Defence & Canadian Forces Fuel Tanks:</u>	Up to May 2001*	Federal	NDFT
The Department of National Defence and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.			
<u>National Defence & Canadian Forces Spills:</u>	Mar 1999-Aug 2010	Federal	NDSP
The Department of National Defence and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.			
<u>National Defence & Canadian Forces Waste Disposal Sites:</u>	2001-Apr 2007	Federal	NDWD
The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.			
<u>National Environmental Emergencies System (NEES):</u>	1974-2003	Federal	NEES
In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for all previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.			
<u>National PCB Inventory:</u>	1988-2008	Federal	NPCB
Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. All federal out-of-service PCB containing equipment and all PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites.			
<u>National Pollutant Release Inventory:</u>	1993-2010	Federal	NPRI
Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.			
<u>Oil and Gas Wells:</u>	1988-2012	Private	OGW
The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com .			

Ontario Oil and Gas Wells: 1800-Feb 2012 Provincial [OOGW](#)
In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, well cap date, licence no., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Inventory of PCB Storage Sites: 1987-Oct 2004 Provincial [OPCB](#)
The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Orders: 1994-Feb 2013 Provincial [ORD](#)
This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Canadian Pulp and Paper: 1999, 2002, 2004, 2005, 2009 Private [PAP](#)
This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Parks Canada Fuel Storage Tanks: 1920-Jan 2005 Federal [PCFT](#)
Canadian Heritage maintains an inventory of all known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Pesticide Register: 1988-Jun 2012 Provincial [PES](#)
The Ontario Ministry of Environment maintains a database of all manufacturers and vendors of registered pesticides.

TSSA Pipeline Incidents: June 2009-Mar 2012 Provincial [PINC](#)
TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. This database will include spills, strike and leaks from recorded by the TSSA.

Private and Retail Fuel Storage Tanks: 1989-1996* Provincial [PRT](#)
The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Permit to Take Water: 1994-Feb 2013 Provincial [PTTW](#)
This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Ontario Regulation 347 Waste Receivers Summary: 1986-2009 Provincial [REC](#)
Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Record of Site Condition: 1997-Sept 2001, Oct 2004- Provincial [RSC](#)
Feb 2013
The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Retail Fuel Storage Tanks: 1999-Jun 2010 Private [RST](#)
This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Scott's Manufacturing Directory: 1992-Mar 2011 Private [SCT](#)
Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Ontario Spills: 1988-Aug 2012 Provincial [SPL](#)
This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

Wastewater Discharger Registration Database: 1990-2011 Provincial [SRDS](#)
Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation; Mining; Petroleum Refining; Organic Chemicals; Inorganic Chemicals; Pulp & Paper; Metal Casting; Iron & Steel; and Quarries. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

Anderson's Storage Tanks: 1915-1953* Private [TANK](#)
The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Transport Canada Fuel Storage Tanks: 1970-Mar 2007 Federal [TCFT](#)
With the provinces of BC, MB, NB, NF, ON, PE, and QC; Transport Canada currently owns and operates 90 fuel storage tanks. Our inventory provides information on the site name, location, tank age, capacity and fuel type.

TSSA Variances for Abandonment of Underground

Current to Oct 2011

Provincial

[VAR](#)

Storage Tanks:

The TSSA, Under the Liquid Fuels Handling Code and the Fuel Oil Code, all underground storage tanks must be removed within two years of disuse. If removal of a tank is not feasible, you may apply to seek a variance from this code requirement. This is a list of all variances granted for abandoned tanks.

Waste Disposal Sites - MOE CA Inventory:

1970-Feb 2013

Provincial

[WDS](#)

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Waste Disposal Sites - MOE 1991 Historical Approval Inventory:

Up to Oct 1990*

Provincial

[WDSH](#)

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Water Well Information System:

1955-2011

Provincial

[WWIS](#)

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries". All values are an approximation.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property, within the report search radius, and the surrounding area outside the search radius.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red upside down triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and were included as reference.

STANDARD LIMITATIONS

ENVIRONMENTAL INVESTIGATIONS and CHARACTERIZATION PROGRAMS

These Standard Limitations form part of the Report to which they are appended and any use of the Report is subject to them.

1. EXCLUSIVE USE BY CLIENT

This Report was prepared for the exclusive use of the client identified as the intended recipient. Any use of the Report by any other party without the written consent of MMM Group Limited is the sole responsibility of such party. MMM Group Limited accepts no responsibility for damages that may be suffered by any third party as a result of decisions made or actions taken based on the Report.

2. SCOPE, TERMS AND CONDITIONS OF CONTRACT

The observations and investigations (hereinafter referred to as the "Work") upon which this Report is based were carried out in accordance with the scope, terms and conditions of the contract or the proposal pursuant to which the Work was commissioned. The conclusions presented in the Report are based solely upon the scope of services described in the contract or the proposal and governed by the time and budgetary constraints imposed by them.

3. STANDARD OF CARE

The principles, procedures and standards relevant to the nature of the services performed are not universally the same. The Work has been carried out in accordance with generally accepted environmental study and/or professional practices, industry standards and environmental regulations, where applicable. No other warranties are either expressed or implied with respect to the professional services provided under the terms of the contract or the proposal and represented in this Report.

4. SCOPE OF THE WORK

This Report may be based in part on information obtained at discrete sampling and/or monitoring locations. The conditions reported herein were those encountered at the subject property at the time the Work was performed and as present at the discrete sampling/monitoring locations, if any.

Conditions between sampling/monitoring locations may be different than those encountered at the sampling/monitoring locations and MMM Group Limited is not responsible for such differences.

5. REASONABLE CONCLUSIONS

The conclusions contained in this Report are based on the Work and may also consider a review of information from other sources as identified in the Report. The accuracy of information from other sources was not verified unless specifically noted in the Report, nor was it determined if the reviewed information constituted all information that exists and pertains to the subject property.

The conclusions made are based on reasonable and professional interpretation of the information considered. If additional information concerning conditions of relevance to this Report is obtained during future work at the subject property, MMM Group Limited should be notified in order that we may determine if modifications to the conclusions presented in this Report are necessary.

6. REPORT AS A COMPLETE DOCUMENT

This Report must be read as a whole and sections taken out of context may be misleading. If discrepancies occur between the preliminary (draft) and final versions of the Report, the final version of the report shall take precedence.

7. LIMITS OF LIABILITY

MMM Group Limited's liability with respect to the Work is limited to re-performing, without cost, any part of the Work that is unacceptable solely as a result of failure to comply with industry standards. MMM Group Limited's maximum liability is limited in accordance with terms in the original contract, provided that notice of claim is made within regulated timelines as of the date of delivery of the Report.