



Proposed Mixed Use development: 17 & 19 Ann Street, 84 &
90 High Street East, and Part of 91 Park Street East,
Mississauga, Ontario

Hydrogeological Investigation

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1 Introduction

1.1 Project Description

EXP Services Inc. (EXP) was retained by 10 WEST GO GP Inc. to prepare a Hydrogeological Investigation Report associated with the proposed development located at 17 and 19 Ann Street, 84 and 90 High Street East and Part of 91 Park Street East, Mississauga, Ontario (hereinafter referred to as the 'Site').

The Site is municipally addressed as 84 and 90 High Street East, 17 and 19 Ann Street in Mississauga and includes the west portion of a park lot generally known as 91 Park Street East. It is located on the west side of Hurontario Street and is bound by High Street East to the south, Park Street East to the north and Ann Street to the west. The Site is approximately 0.60 hectares (1.48 acres) in area and is currently occupied by one (1) commercial building, three (3) residential buildings and part of a landscaped park on the northeast portion of the Site.

EXP understands that a mixed-use redevelopment is being proposed for the Site. It is understood that the redevelopment will include a high-rise residential building, one (1) to twenty-two (22) storeys high, with ground floor commercial and five (5) levels of underground parking. The lowest level of basement parking will cover half of the area of the underground level. The lowest basement parking level will be at approximately 16.3 meters below ground surface (mbgs) at the north-west portion of the Site. The remaining part of the Site will consist of public parks to the east and south of the proposed condominium to be conveyed to City and public spaces, while the existing two (2) residential buildings of 84 and 90 High Street East are to be maintained. The Site location plan is shown on Figure 1.

EXP conducted a Preliminary Geotechnical Investigation and Environmental Site Assessment in conjunction with this investigation. The pertinent information gathered from the noted investigations is utilized for this report.

1.2 Project Objectives

The main objectives of the Hydrogeological Investigation are as follows:

- Establish the local hydrogeological settings within the Site;
- Assess construction dewatering flow rates and potential impacts;
- Assess long-term foundation sub-drain discharge volumes;
- Assess groundwater quality; and
- Prepare a Hydrogeological Investigation Report.

1.3 Scope of Work

To achieve the investigation objectives, EXP has completed the following scope of work:

- Reviewed available geological and hydrogeological information for the Site;
- Utilized all monitoring wells installed during the combined investigation;

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- Developed and conducted Single Well Response Tests (SWRT) on all newly installed monitoring wells (shallow and deep) to assess hydraulic conductivities of the saturated soils at the Site;
- Completed two (2) rounds of groundwater level measurements at all monitoring wells;
- Collected one (1) groundwater sample from a selected monitoring well for laboratory testing of the City of Mississauga/Regional Municipality of Peel Sanitary and Storm Sewer By-Law parameters;
- Evaluated the information collected during the field investigation program, including borehole geological information, Water Well Records (WWR), SWRT results, groundwater level measurements and groundwater water quality;
- Prepared site plans, cross sections, geological mapping and groundwater contour mapping for the Site;
- Provided preliminary recommendations on the requirements for construction and long-term dewatering;
- Provided recommendations on the Ministry of Environment, Conservation and Parks (MECP) Water Taking Permits and Regional Municipality of Peel Sewer Discharge Agreements (SDA) for the construction and post-construction phases; and
- Prepared a Hydrogeological Investigation Report.

The Hydrogeological Investigation was prepared in accordance with the Ontario Water Resources Act and Ontario Regulation 387/04. The scope of work outlined above was made to assess dewatering and did not include a review of Environmental Site Assessments (ESA).

1.4 Review of Previous Reports

The following reports were reviewed as part of this Hydrogeological Investigation:

- EXP Services Inc. (August 24, 2021), Phase Two Environmental Site Assessment, 84,90 High Street, 17, 19 Ann Street and Park Lot, Mississauga, Ontario, prepared for 10 West Go GP Inc.
- EXP Services Inc. (August 6, 2021), Preliminary Geotechnical Investigation, Proposed Mixed-Use Redevelopment, Mississauga, ON, prepared for 10 West Go GP Inc.

2 Hydrogeological Setting

2.1 Regional Setting

2.1.1 Regional Physiography

The Site is within a physiographic region known as the Iroquois Plain. The physiographic landform is named Sand Plains. The South Slope lies to the north of the Iroquois Plain (Chapman & Putnam, 2007).

The Iroquois Plain was created along the shores of former Lake Iroquois, an ancient glacial lake. The noted Plain primarily consists of shallow water sandy deposits.

The topography of the Iroquois Plain is relatively flat with a gradual slope to the south, toward Lake Ontario.

2.1.2 Regional Geology and Hydrogeology

The surficial geology can be described as glaciolacustrine-derived silty to clayey silt deposits (Ministry of Northern Development and Mines, 2012). The surficial geology of the Site and surrounding areas is shown on Figure 2.

Based on the available regional geology maps, the subsurface stratigraphy of the Site from top to bottom is summarized in Table 2-1 (Oak Ridges Moraine Groundwater Program, 2021). The overburden thickness is approximately 4 meters.

Table 2-1: Summary of Subsurface Stratigraphy

Stratigraphic Unit	General Description	Top Elevation of Stratigraphic Unit
Scarborough Formation (Aquifer)	This geology unit is interpreted as deposits of a fluvial-deltaic system fed by large braided melt-water rivers draining from an ice sheet. It consists of peat sand overlaying silt and clay deposits.	81
Georgian Bay Formation*	Bedrock primarily consists of interbedded shale, limestone, dolostone and siltstone. It belongs to the Upper Ordovician, (Ministry of Northern Development and Mines, 2012).	74

* Not encountered onsite.

Regional groundwater across the area flows southeast, towards Lake Ontario (Oak Ridge Moraine Groundwater Program, 2018). Local deviation from the regional groundwater flow pattern may occur in response to changes in topography and/or soils, as well as the presence of surface water features and/or existing subsurface infrastructure.

2.1.3 Existing Water Well Survey

Water Well Records (WWRs) were compiled from the database maintained by the Ministry of the Environment, Conservation and Parks (MECP) and reviewed to determine the number of water wells documented within a 500-m radius of the Site boundaries. The locations of the MECP WWRs within 500 m of the Site are shown on Figure 3. A summary of the WWR is included in Appendix A.

The MECP WWR database indicates that one hundred and eleven (111) records within a 500 m radius from the Site centroid (Figure 3 and Appendix A). Well distances are calculated relative to the Site centroid, therefore some distances in Appendix A exceed 500 m.

The database indicates that the offsite wells are at an approximate distance of seventy-nine (79) m or greater from the Site centroid. All offsite wells were reportedly identified as monitoring and observation wells, test holes, dewatering wells, abandoned and/or listed with unknown use.

The reported water levels ranged from depths of 1.3 m to 6.7 meters below ground surface (mbgs).

2.2 Site Setting

2.2.1 Site Topography

The Site is in a residential area. The topography is considered relatively flat with a regional gradual southeasterly slope towards Lake Ontario.

As indicated on the borehole logs included in Appendix B, the surface elevation of the Site ranges between approximately 88.65 and 93.30 meters above sea level (masl).

2.2.2 Local Surface Water Features

The Site is within the Lake Ontario watershed. No surface water features exist onsite. Mary Fix Creek and Kenollie Creek were formerly flowing approximately 150 m east and 200 m west of the Site, respectively, and discharged into Lake Ontario. These creeks were rerouted into a drain that empties in the Credit River at the CN Bridge in Port Credit. The nearest surface water feature is Lake Ontario, approximately 400 m from the Site boundary to the southeast.

2.2.3 Local Geology and Hydrogeology

A summary of subsurface soil stratigraphy is provided in the following paragraphs. The soil descriptions are based on the geotechnical investigation report (EXP, 2018). They are summarized for the hydrogeological interpretations. As such, the information provided in this section shall not be used for construction design purposes.

The detailed soil profiles encountered in each borehole and the results of moisture content determinations are presented on the attached borehole logs (Appendix B). The soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the Hydrogeological Investigation and shall not be interpreted as exact planes of geological change.

The "Notes on Sample Description" preceding the borehole logs form an integral part of and should be read in conjunction with this report. The following is a brief description of the soil conditions encountered during the investigation.

Based on the results of the geotechnical investigation, the general subsurface soil stratigraphy consists of the following units from top to bottom:

Topsoil

Topsoil of about 150 to 300 mm in thickness was encountered at the ground surface at Boreholes 1, 5, 7 and 10.

With respect to topsoil, it should be noted that topsoil measurements were carried out at the borehole locations only and could differ at other locations on the Site. Consequently, topsoil quantities should not be established from the information provided at the borehole locations. If required, a more detailed test pit program should be carried out to quantify the amount of topsoil more accurately to be removed for construction purposes.

Pavement Structure

Pavement structure comprising asphalt with thickness ranging from about 25 to 50 mm underlain by granular base 125 to 530 mm in thickness was encountered at the Boreholes 2, 3, 4, 8 and 9.

Fill

Fill was encountered below the surficial pavement structure in Boreholes 2, 3, 4, 8, and 9, topsoil in Boreholes 1, 5, 7 and 10 and from surface in Borehole 6. The fill extends to depths ranging from about 0.9 to 3.1 m below existing ground surface (~Elevation 81.2 to 78.6 m). The fill comprises a mix of sand and gravel, sandy silt, and clayey silt in various proportions. Moisture contents in the fill ranged from approximately 9 and 25 percent.

Sandy Silt

The fill was underlain by a sandy silt deposit at Boreholes 1 and 3. This deposit contains some clay with sand seams. It is generally brown in colour, has moisture contents of about 15 percent of dry mass indicating moist condition and is in a dense state of compactness. The sandy silt extends to depths of about 1.7 to 2.3 m below existing ground surface (~Elevation 80.4 to 79.4 m).

Clayey Silt Till

A clayey silt till deposit was intersected below the fill at all borehole locations except for Boreholes 1 and 3, where it underlies the sandy silt. This deposit contains a trace of sand and gravel with occasional cobble fragments, oxidations, and weathered shale fragments. It is generally brown in colour changing to grey with increase in depth. It has moisture contents of about 7.9 to 15.6 percent of dry mass indicating moist condition and is in a stiff to hard state of consistency. Boreholes 8 to 10 were terminated in the clayey silt till at depths of approximately 4.9 to 5.2 m (~Elevation 76.7 to 75.9 m). The clayey silt till was fully penetrated in the remaining boreholes upon contact with bedrock at depths of approximately 7.4 to 9.2 m (~Elevation 74.8 to 73.2 m).

Shale Bedrock

Shale bedrock of the Georgian Bay Formation was encountered below the clayey silt till in Boreholes 1 to 7. The approximate elevation for the bedrock encountered at each borehole is presented in the individual borehole and core logs. Approximately 6.3 to 7.9 m of shale bedrock was cored in Boreholes 1 to 7. The detailed findings from the rock cores are presented in the respective rock core logs for each borehole.

Based on the rock core information, the shale bedrock comprises about 90 to 94% shale, 1 to 5% limestone, 4 to 8% siltstone and 0 to 2% rubble or clay seams. The core recovery ranged from about 67 to 100%. The Rock Quality Designation (RQD), a rock quality indicator, is defined as the sum of core lengths of 100 mm or greater divided by the total length of the drill run. The recorded RQD ranged from about 0 to 100%, indicating very poor to excellent (generally fair) quality. The shale bedrock generally consists of moderately soft bedded grey shale with some limestone and siltstone interbeds and is highly weathered in the upper zones becoming sound with depth. Boreholes 1 to 7 were terminated in the shale bedrock at depths ranging from about 15.4 to 15.9 m below existing ground surface (~Elevation 66.9 to 65.6 m).

The borehole and monitoring well locations are shown on Figure 4. Geological cross-sections were generated based on the available borehole logs completed as part of the previous and current investigations and shown on Figure 5A (Cross section A-A') and Figure 5B (Cross section B-B'). The cross section shows a simplified representation of soil conditions and soil deposits may be interconnected differently than represented. Borehole logs used to generate both cross-sections are provided in Appendix B.

3 Results

3.1 Monitoring Well Details

The monitoring well network was installed as part of the Geotechnical and Environmental Investigations at the Site. It consists of the following:

- Three (3) shallow overburden monitoring wells (BH/MW2, BH/MW3S, and BH/MW5S) were installed;
- Five (5) deep bedrock monitoring well (BH/MW1, BH/MW3D, BH/MW5D, BH/MW6, and BH/MW7) were installed.

The diameter of all monitoring wells is 50 mm. All wells were installed with a flush mount protective casing. Borehole logs and monitoring well installation details are provided in Appendix B. The monitoring well locations are shown on Figure 4.

3.2 Water Level Monitoring

As part of the Hydrogeological Investigation, static water levels in the monitoring wells installed outside of the existing building were recorded in two (2) monitoring events, including July 12-13 and August 17, 2021. A summary of all static water level data as it relates to the elevation survey is given in Table 3-1 below.

The groundwater elevation range for the Shallow Wells ranged from <75.117 masl (>7.21 mbgs at BH/MW 5S on 26 October and 9 November, 2021) to 77.62 masl (4.76 mbgs at BH/MW 2 on 12 July, 2021). The groundwater elevation range for the Deep Wells ranged from 70.85 masl (11.53 mbgs at BH/MW 5D on 9 November, 2021) to 75.21 masl (7.51 mbgs at BH/MW 1 on 12 July, 2021)

Table 3-1: Summary of Measured Groundwater Elevations

Monitoring Well ID	Ground Surface Elevation (masl)	Approximate Full Well Depth (mbgs)	Depth	12-Jul-2021	14-Jul-2021	17-Aug-2021	26-Oct-2021	9-Nov-2021
BH/MW 1	82.72	13.97	mbgs	7.51	8.39	9.35	10.08	10.05
			masl	75.21	74.33	73.37	72.64	72.67
BH/MW 2	82.38	7.61	mbgs	4.76	6.63	6.75	7.07	na
			masl	77.62	75.75	75.63	75.31	na
BH/MW 3S	81.03	5.66	mbgs	DRY	DRY	DRY	DRY	DRY
			masl	<75.37	<75.37	<75.37	<75.37	<75.37
BH/MW 3D	81.03	15.52	mbgs	9.83	9.75	9.72	9.76	9.80
			masl	71.20	71.28	71.31	71.27	71.23
BH/MW 5S	82.38	7.21	mbgs	7.10	7.00	7.14	DRY	DRY
			masl	75.28	75.38	75.24	<75.17	<75.17
BH/MW 5D	82.38	15.41	mbgs	7.96	11.19	9.40	11.22	11.53
			masl	74.42	71.19	72.98	71.16	70.85
BH/MW 6	82.09	14.62	mbgs	8.34	8.44	9.26	10.83	10.92
			masl	73.75	73.65	72.83	71.26	71.17
BH/MW 7	82.21	15.81	mbgs	8.71	10.65	10.43	11.16	10.88
			masl	73.50	71.56	71.78	71.05	71.33

* If < 75.0 masl then likely not static water levels.

A map was created for the Site to show groundwater contours of the water-bearing zones (Figure 6). Accordingly, the groundwater flow direction is interpreted to be southeast of the Site, towards Lake Ontario.

Groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions. This may also affect the direction and rate of flow. It is recommended to conduct seasonal groundwater level measurements to provide more information on seasonal groundwater level fluctuations.

3.3 Hydraulic Conductivity Testing

Eight (8) Single Well Response Tests (SWRT's) were completed on monitoring wells BH/MW1, BH/MW2, BH/MW3S, BH/MW3D, BH/MW5S, BH/MW5D, BH/MW6, and BH/MW7 on August 4, 2021. The tests were completed to estimate the saturated hydraulic conductivity (K) of the soils at the well screen depths.

The static water level within each monitoring well was measured prior to the start of testing. In advance of performing SWRTs, each monitoring well underwent development to remove fines introduced into the screens following construction. The development process involved purging of the monitoring wells to induce the flow of fresh formation water through the screen. Each monitoring well was permitted to fully recover prior to performing SWRTs.

Hydraulic conductivity values were calculated from the SWRT and constant rate test data as per Hvorslev's solution included in the Aqtesolv Pro. V.4.5 software package. The semi-log plots for normalized drawdown versus time are included in Appendix C.

A summary of the hydraulic conductivities (K-values) estimated from the SWRTs are provided in Table 3-2A and 3-2B.

Table 3-2A: Summary of Hydraulic Conductivity Testing in Overburden

Monitoring Well	Well Depth (mbgs)	Screen Interval (mbgs)		Soil Formation Screened	Estimated Hydraulic Conductivity (m/s)
		From	To		
BH/MW 2	7.61	4.61	7.61	Fill/Clayey Silt Till	4.0E-9
BH/MW 3S	5.66	2.66	5.66	Fill/Clayey Silt Till	7.4E-8
BH/MW 5S	7.21	4.21	7.21	Fill/Clayey Silt Till	1.1E-7
Highest Estimated K Value					1.1E-7
Geometric Mean of Estimated K Values					3.2E-8

Table 3-2B: Summary of Hydraulic Conductivity Testing in Shale

Monitoring Well	Well Depth (mbgs)	Screen Interval (mbgs)		Rock Formation Screened	Estimated Hydraulic Conductivity (m/s)
		From	To		
BH/MW 1	13.97	10.97	13.97	Shale Bedrock	1.4E-7
BH/MW 3D	15.52	12.52	15.52	Shale Bedrock	1.4E-7
BH/MW 5D	15.41	12.41	15.41	Shale Bedrock	1.3E-8
BH/MW 6	14.62	11.62	14.62	Shale Bedrock	2.2E-7
BH/MW 7	15.81	12.81	15.81	Shale Bedrock	3.2E-8
Highest Estimated K Value					2.2E-7
Geometric Mean of Estimated K Values					7.1E-8

SWRTs provide K-estimates of the geological formation surrounding the well screens and may not be representative of bulk formation hydraulic conductivity. As shown in Table 3-2A, the highest K-value of the overburden is $1.1\text{E-}7$ m/s. As shown in Table 3-2B, the highest K-value of saturated bedrock is $2.2\text{E-}7$ m/s, and the geometric mean of the K-values is $7.1\text{E-}8$ m/s.

3.4 Groundwater Quality

To assess the suitability for discharging pumped groundwater into the sewers owned by the City of Mississauga / Region of Peel during dewatering activities, one (1) groundwater sample was collected from monitoring well BH/MW1 on July 14, 2021, using a peristaltic pump. Three (3) sets of additional samples were collected from monitoring wells BH/MW 3D, 6 and 7 for selected parameters (Total and Dissolved Metals, Total Suspended Solids, Total Kjeldahl Nitrogen and Chloroform) on October 29, 2021.

As part of Phase 2 Environmental Assessment Three (3) groundwater samples were collected from monitoring wells, MW1, MW11 and MW5D using the same sampling method on July 15 and 16, 2021.

Prior to collecting the noted water sample, approximately three (3) standing well volumes of groundwater were purged from the referred well. The samples were collected unfiltered and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The groundwater samples were submitted for analysis to Bureau Veritas Laboratory, a CALA certified independent laboratory in Mississauga, Ontario. Analytical results are provided in Appendix D.

Please note that, as per the Corporation of the City of Mississauga Storm Sewer By-Law (0046-2022) following changes have been made to the existing Storm Sewer By-Law Criteria:

- Total Kjeldahl Nitrogen (TKN) and Chloroform were removed from the list of regulated parameters
- Included a criteria limit of 1,000 ug/L for the concentration of Total Aluminum
- Reduced criteria limit for Total Copper from 50 ug/L to 40 ug/L
- Increased the Criteria limit for Total Manganese from 50 ug/L to 2,000 ug/L
- Increased the Criteria limit for Total Zinc from 40 ug/L to 200 ug/L

Table 3-3 summarizes exceedance(s) of the Sanitary (Table 1) and Storm (Table 2) Sewer Use By-Law parameters.

By-Law Sample Results

When comparing the chemistry of the collected groundwater sample to the Regional Municipality of Peel Sanitary Sewer Discharge Criteria (Table 1), there were no parameter exceedances to be reported.

When comparing the chemistry of the collected groundwater sample to the City of Mississauga / Regional Municipality of Peel Storm Sewer Discharge Criteria (Table 2) the following parameters reported an exceedance: Total Suspended Solids (TSS) and Total Aluminum (Al).

It is expected that the reported Total Aluminum concentrations above the Storm Sewer By-Law criteria is possibly related to the high Total Suspended Solids in the sample.

Reporting detection limits (RDLs) were below the Sewer Use By-Law parameter criteria of Tables 1 and 2.

Phase 2 ESA Sample Results

When comparing the chemistry of the collected groundwater samples to the regional Municipality of Peel Sanitary Sewer Discharge Criteria (Table 1), there is no parameter exceedances to be reported.

When comparing the chemistry of the collected groundwater samples to the City of Mississauga / Regional Municipality of Peel Storm Sewer By-Law Criteria (Table 2) there is no parameter exceedances to be reported.

Reporting detection limits (RDLs) were below the Sewer Use By-Law parameter criteria of Tables 1 and 2.

Table 3-3: Summary of Analytical Results

Parameter	Units	Regional Municipality of Peel Sanitary Sewer Discharge Limit (Table 1)	Regional Municipality of Peel Storm Sewer Discharge Limit (Table 2)	BH/MW 1 July 14, 21 (HG)	BH/MW 3D Oct 29, 21 (HG)	BH/MW 6 Oct 29, 21 (HG)	BH/MW 7 Oct 29, 21 (HG)
Total Suspended Solids (TSS)	mg/L	350	15	24	52	69	79
Total Aluminum (Al)	Ug/L	5,000	1,000	800	1,500	3,100	3,000

Bold – Exceeds Regional Municipality of Peel Storm Sewer Discharge Limit (Table 2).

For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (e.g., Total Metals) in the pumped groundwater may become elevated and exceed both, Sanitary and Storm Sewer Use By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.

For the long-term dewatering discharge to the storm sewer system (post-development phase) and based on the water quality results, a suitable pre-treatment would be required to meet the storm sewer criteria.

The water quality results presented in this report may not be representative of the long-term condition of groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase, as required by the City of Mississauga.

An agreement to discharge into the sewers owned by the Regional Municipality of Peel will be required.

4 Dewatering Assessment

EXP understands that a mixed-use redevelopment is being proposed for the Site. It is understood that the redevelopment will include a high-rise residential building, one (1) to twenty-two (22) storeys high, with ground floor commercial and five (5) levels of underground parking. The lowest level of basement parking will cover half of the area of the underground level. Table 4-1 presents the assumptions used to calculate the dewatering rate for the Site.

Table 4-1 Construction and Long-Term Dewatering Estimate Assumptions

Input Parameter	Assumption	Units	Notes
Ground Surface Elevation (FFE)	82.3	masl	Approximate elevation based on the borehole logs and Site
Groundwater elevation	81.0	masl	Assumption based on regional ORMGP groundwater contours; shallow perched water table is expected within shallow soil layers.
Point Towers/Podiums	1 Tower, 0 Podiums	-	
Number of Subgrade Levels	5 Levels	-	P5
Top of Lowest Slab Elevation	66.0	masl	As per Architectural drawings (Corearchitects, December 10, 2021)
Long Term Dewatering Elevation Target	65.5	masl	0.5 m below top of slab
Lowest Footing Elevation	64.5	masl	Assumed to be approximately 1.5 m below the top of lowest slab elevation
Construction Dewatering Elevation Target	63.50	masl	Assumed to be approximately 1.0 m below the lowest footing elevation
Bottom Elevation of Water-Bearing Zone	60.5	masl	Assumed based approximately 3 m below target water level
Excavation Area (Length x Width)	4,131 (81 x 51)	m ² (m x m)	Approximate area (length x width) of Site for the proposed development
Hydraulic Conductivity (K)	1.9E-7 9.5E-8	m/s	ST Weighted high K-value for overburden/bedrock LT Weighted average K-value for overburden/bedrock
Specific Yield	0.05		Assumed for overburden/bedrock

4.1 Dewatering Flow Rate Estimate and Zone of Influence

The Dupuit-Forcheimer equation for radial flow to both sides of an excavation through an unconfined aquifer resting on a horizontal impervious surface was used to obtain a flow rate estimate. Dewatering flow rate is expressed as follows:

$$Q_w = \frac{\pi K (H^2 - h^2)}{\ln \left[\frac{R_o}{r_e} \right]}$$

$$r_e = \frac{a+b}{\pi} \quad R_o = R_{cj} + r_e$$

Where:

- Q_w = Rate of pumping (m³/s)
- K = Hydraulic conductivity (m/s)
- H = Hydraulic head beyond the influence of pumping (static groundwater elevation) (m)
- h = Hydraulic head above the base of aquifer in an excavation (m)
- R_o = Radius of influence (m)
- R_{cj} = Cooper-Jacob's radius of influence (m)
- r_e = Equivalent perimeter (m)
- a = Length of the excavation area (m)
- b = Width of the excavation area (m)

It is expected that the initial dewatering rate will be higher to remove groundwater from within the overburden formation. The dewatering rates are expected to decrease once the target water level is achieved in the excavation footprint as groundwater will have been removed, primarily from storage, resulting in lower seepage rates into the excavation.

4.2 Cooper-Jacob's Radius of Influence

The radius of influence (R_{cj}) for the construction dewatering was calculated based on Cooper-Jacob's equation. This equation is used to predict the distance at which the drawdown resulting from pumping is negligible.

The estimated radius of influence due to pumping is based on Cooper-Jacob formula as follows:

$$R_{cj} = \sqrt{2.25 K D t / s}$$

Where:

- R_o = Estimated radius of influence (m)
- D = Aquifer thickness (original saturated thickness) (m)
- K = Hydraulic conductivity (m/sec)
- S = Storage coefficient
- t = Duration of pumping (s)

Based on Cooper-Jacob's formula and the highest K-value, the calculated radius of influence (R_{cj}) is provided in Appendix E.

4.3 Stormwater

Additional pumping capacity may be required to maintain dry conditions within the excavation during and following significant precipitation events. Therefore, the dewatering rates at the Site should also include removing stormwater from the excavation.

A 15 mm precipitation event was utilized for estimating the stormwater volume. The calculation of the stormwater volume is included in Appendix E.

The estimate of the stormwater volume only accounts for direct precipitation into the excavation. The dimensions of the excavation are considered in the dewatering calculations. Runoff from outside of the excavation's footprint is excluded and it should be directed away from the excavation.

During precipitation events greater than 15 mm (ex: 100-year storm), measures should be taken by the contractor to retain stormwater onsite in a safe manner to not exceed the allowable water taking and discharge limits, as necessary. A two (2) and a one hundred (100) year storm event over a 24-hour period are 56.0 and 121.8 mm, respectively, which would produce 231,000 and 503,000 L of water.

4.4 Results of Dewatering Rate Estimates

4.4.1 Construction Dewatering Rate Estimate

For this assessment, it was assumed that the proposed construction plans include an excavation without shoring system. EXP should be retained to review the assumptions outlined in this section, should the assumed shoring design change. Short-term (construction) dewatering calculations are presented in Appendix E.

Pits (elevator, sump pits) are assumed to have the same excavation depth and dewatering target as the main excavation; deeper pits may require localized dewatering and revised dewatering estimates.

Based on the assumptions provided in this report, the results of the dewatering rate estimate can be summarized as follows:

Table 4-2 Summary of Construction Dewatering Rate

Description	With 5 Levels of Underground Parking (L/day)
Estimated Short Term Dewatering Rate (without safety factor or precipitation)	51,700
From Precipitation Event of 15 mm in one day	62,000
With Factor of Safety of 2.0 (excluding precipitation) for permit	103,400
With Factor of Safety of 2.0 (including precipitation) for designs, and budgeting	165,400
Radius of Influence from sides of excavation (m)	21

The peak dewatering flow rates does not account for flow from utility beddings and variations in hydrogeological properties beyond those encountered during this investigation.

Local dewatering may be required for pits (elevator pits, sump pits), if these extend deeper than the dewatering target. Local dewatering is not considered to be part of this assessment. Dewatering estimates should be reviewed once the pit dimensions are available.

Local dewatering may be required for pits (elevator pits, sump pits, raft) and for localized areas with permeable, soft, or wet soil conditions. Local dewatering is not considered to be part of this assessment, but contractor should be ready to install additional system to manage such conditions. Dewatering estimates should be reviewed once the pit dimensions are available.

All grading around the perimeter of the excavation should be graded away from excavation and ramp/site access to redirect runoff away from excavation.

If caisson walls are installed, these should be designed for maximal hydrostatic pressure for shallow and deep water levels, without dewatering on the outside. Soldier pile and lagging and caisson wall systems should be designed to account for shallow groundwater conditions and take into consideration that dewatering systems may not provide fully dewatered conditions.

If caisson walls are used for decreasing long-term dewatering rates, these should be designed as permanent structures to cutoff groundwater inflow in the long-term. All perforations should be sealed permanently (ex: tiebacks, breaches, and cold joints) with no leakages and inspected. Fillers should extend into low permeability deposits (ex: sound bedrock or till) to cutoff groundwater from water bearing zones. Inspections should be conducted to confirm the depth of low permeability deposits along shoring system and that fillers are keyed into low permeability soil deposits.

The contractor is responsible for the design of the dewatering systems (depth of wells, screen length, number of wells, spacing sand pack around screens, prevent soil loss etc.) to ensure that dry conditions are always maintained within the excavation at all costs.

Dewatering should be monitored using dedicated monitoring wells within and around the perimeter of the excavation, and these wells should be monitored using manual measurements and with electronic data loggers; records should be maintained onsite to track dewatering progress. Discharge rates should be monitored using calibrated flow meters and records of dewatering progress, and daily precipitation as per MECP requirements should be maintained.

4.4.2 Post-Construction Dewatering Rate Estimate

It is our understanding that the development plan includes a permanent foundation sub-drain system that will ultimately discharge to the municipal sewer system if conventional footings are installed.

The long-term dewatering was based on the same equations as construction dewatering shown in Section 4.1.

The calculation for the estimated flow to the future sub-drain system (with no cutoff walls) is provided in Appendix F. The dewatering target for the foundation drainage system is taken at 0.5 m below the lowest slab elevation.

The foundation drain analysis provides a flow rate estimate. Once the foundation drain is built, actual flow rate measurements of the sump discharge will be required to confirm the estimated flow rate.

Based on the assumptions provided in this report, the estimated sub-drain discharge volumes are summarized in Appendix F. Seasonal and daily fluctuations are expected. These estimates may be affected by hydrogeological conditions beyond those encountered at this time, fluctuations in groundwater regimes, surrounding Site alterations, and existing and future infrastructures.

For the design of foundations without perimeter and/or foundation drainage system, shallower wells need to be considered to evaluate the shallow groundwater table. The hydrogeologist needs to be consulted during the design process.

Table 4-3: Summary of Long-Term Dewatering Rate

Long-Term Dewatering Flow Rate	With 5 Levels of Underground Parking (L/day)
Long-Term Dewatering Rate without Safety Factor	16,200
Long-Term Dewatering Rate with Safety Factor of 1.5 for design, budgeting and permitting	24,300

Intermittent cycling of sump pumps and seasonal fluctuation in groundwater regimes should be considered for pump specifications. A safety factor was applied to the flow rate to account for water level fluctuations due to seasonal changes.

These estimates assume that pits (elevator and/or sump pits) are made as watertight structures (without drainage), if their depths extend below the dewatering target, as previously stated. The sub-drain rate estimate is based on the assumptions outlined in this report. Any variations in hydrogeological conditions beyond those encountered as part of this investigation may significantly influence the sub-drain discharge volumes.

4.5 MECP Water Taking Permits

4.5.1 Short-Term Discharge Rate (Construction Phase)

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering is more than 50,000 L/day but less than 400,000 L/day, then an online registration in the Environmental Activity and Sector Registry (EASR) with the MECP will be required. If groundwater dewatering rates onsite exceed 400,000 L/day, a Category 3 Permit to Take Water (PTTW) will be required from the MECP.

As of July 1, 2021, an amendment of O. Reg. 63/16 has come into effect and replaced the former subsection 7 (5) such that the water taking limit of 400,000 L/day would apply to groundwater takings of each dewatered work area only, excluding stormwater.

It is recognized that the maximum flow estimate calculated with a weighted high K-value, provides a conservative estimate to account for higher than expected flow rates during construction dewatering. The dewatering estimates including a safety factor and excluding precipitation is stated below. The MECP construction dewatering rate excludes the precipitation amount and is the rate used for the permit application. Based on the MECP construction dewatering an EASR would be required to facilitate the construction dewatering program of the Site.

Table 4-4: MECP Construction Dewatering Flow Rate

Scenario	Flow Rate (L/day)
MECP Construction Dewatering Flow Rate with Safety Factor of 2.0 (Excluding rainwater collection)	103,400

A Discharge Plan (dewatering sketch, sewer discharge agreement) must be developed and applied for any discharges from the Site. Monitoring of both water quantity and water quality must be carried out for the entire duration of the construction dewatering phase. During this phase, the Discharge Plan and the daily water taking records must be available onsite.

The EASR, Discharge Plan, hydrogeological investigation report, and geotechnical assessment of settlements must also be available at the construction Site during the entire construction dewatering. EXP should be notified immediately about any changes to the construction dewatering schedule or design, since the EASR will need to be updated to reflect these modifications. Altogether, the hydrogeological report, EASR, Discharge Plan and geotechnical assessment constitute the Water Taking Plan which needs to be available onsite during the construction dewatering.

4.5.2 Long-Term Discharge Rate (Post Construction Phase)

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering is more than 50,000 L/day, then an application for a Category 3 Permit to Take Water (PTTW) will be required from the MECP.

It is recognized that the maximum flow rate calculated with a high K-value, provides a conservative estimate to account for higher than expected flow rates during the post-development dewatering. Based on the dewatering estimate of approximately 24,300 L/day (applying a safety factor of 1.5) for this project, a Category 3 Permit to Take Water (PTTW) will not be required to facilitate the post-development phase.

The anticipated long-term dewatering rate can be considered as low and the effect of discharging these daily volumes to the City of Mississauga sewer system can be considered nominal with no adverse impacts pending further review by the civil engineer.

The safety factor for construction (short-term) dewatering is selected larger than for long-term to account for anticipated greater groundwater volumes during initial dewatering. The applied analytical formula is adequate for long-term (steady state) conditions as it omits specific yield and time dependency. When the formula is used for short-term conditions a larger safety factor is recommended to cover a larger initial dewatering rate, which is required to remove stored groundwater. Moreover, a large initial construction dewatering rate is favorable, as it supports reducing the time to reach the dewatering target elevation.

5 Environmental Impact

5.1 Surface Water Features

The Site is within the Lake Ontario watershed. No surface water features exist onsite. The nearest surface water feature is Lake Ontario, approximately 400 m from the Site boundary to the southeast.

Due to the limited extent of zone of influence and the wide distance to the nearest surface water feature, no detrimental impacts on surface water features are expected during construction activities.

5.2 Groundwater Sources

Well Records from the MECP Water Well Record (WWR) Database were reviewed to determine that no water supply wells are documented to exist within a 500 m radius of the Site boundaries. Given that the dewatering zone of influence is limited, no dewatering related impact is expected on water supply wells in the area, if existent.

5.3 Geotechnical Considerations

As per the MECP technical requirement for EASRs, the geotechnical assessment of the stability of the soils due to water taking (ex: settlement, soil loss, subsidence, etc.) is required. The water taking should not have unacceptable interference on soils and underground structures (foundations, utilities, etc.).

A letter related to geotechnical issues as it pertains to the Site is required to be completed under a separate cover.

5.4 Groundwater Quality

It is our understanding that the potential effluent from the dewatering system during the construction will be released to the municipal sewer system. As such, the quality of groundwater discharge is required to conform the Regional Municipality of Peel Sewer Use By-Law.

For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (for example, Total Metals) in the pumped groundwater may become elevated and exceed both, Sanitary and Storm Sewer Use By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.

For the long-term dewatering discharge to the sanitary sewer system (post-development phase), and based on the water quality test results, the water is suitable to be released without a treatment system.

Dewatering (short and long-term) may induce migration of contaminants within the zone of influence and beyond due to changing hydraulic gradients, hydrogeological conditions beyond Site boundaries and preferential pathways in utility beddings etc. The water quality sampling conducted as part of this assessment was performed under static conditions. As a result, monitoring may be required during dewatering activities (short and long-term) to monitor potential migration, and this should be performed more frequently during early dewatering stages.

For the long-term dewatering discharge to the storm sewer system (post-development phase) and based on the water quality results, a pre-treatment will be required to meet the storm sewer criteria.

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The water quality results presented in this report may not be representative of the long-term condition of groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase as required by the City of Mississauga.

An agreement to discharge into the sewers owned by the Regional Municipality of Peel will be required prior to releasing dewatering effluent.

The Environmental Site Assessment Report(s) shall be reviewed for more information on the groundwater quality conditions at the Site.

5.5 Well Decommissioning

In conformance with Regulation 903 of the Ontario Water Resources Act, the installation and eventual decommissioning of any dewatering system wells or monitoring wells must be completed by a licensed well contractor. This will be required for all wells that are no longer in use.

6 Conclusions and Recommendations

Based on the findings of the Hydrogeological Investigation, the following conclusions and recommendations are provided:

- When comparing the chemistry of the collected groundwater sample to the Regional Municipality of Peel Sanitary Sewer Discharge Criteria (Table 1), there were no parameter exceedances to be reported.
- When comparing the chemistry of the collected groundwater sample to the City of Mississauga / Regional Municipality of Peel Storm Sewer Discharge Criteria (Table 2) the following parameters reported an exceedance: Total Suspended Solids (TSS) and Total Aluminum.
- Based on the assumptions outlined in this report, the estimated peak dewatering rate for proposed construction activities is approximately 165,400 L/day. This is the rate which will be required to be discharged to the municipal sewer system.
- Based on the assumptions outlined in this report, the estimated peak MECP dewatering rate for proposed construction activities is approximately 103,400 L/day. As the dewatering flow rate estimate is between 50,000 L/day and 400,000 L/day, an EASR will be required to facilitate the construction dewatering program for the Site.
- The long-term flow rate of the foundation sub-drain is estimated to be approximately 24,300 L/day. It is recommended that once the sub-drain system is in place, a flow meter be installed at the sump(s) to record daily discharge volumes during the commissioning stage of the system. Regular maintenance/cleaning of the sub-drain system is recommended to ensure its proper operation. A PTTW will not be required for long-term discharge.
- The construction dewatering and long-term estimate of sub-drain discharge volumes is based on the assumptions outlined in this report. Any variations in hydrogeological conditions beyond those encountered as part of this preliminary investigation may significantly influence the discharge volumes.
- For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (e.g., Total Metals) in the pumped groundwater may become elevated and exceed both, Sanitary and Storm Sewer Use By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.
- For the long-term dewatering discharge to the sanitary sewer system (post-development phase) and based on the water quality test results, the water is suitable to discharge without a treatment system.
- For the long-term dewatering discharge to the storm sewer system (post-development phase) and based on the water quality results, it is recommended to implement a suitable pre-treatment as required.
- As per the MECP technical requirement for EASRs, the geotechnical assessment of the stability of the soils due to water taking (ex: settlement, soil loss, subsidence etc.) is required. The water taking should not have unacceptable interference on soils and underground structures (foundations, utilities etc.). A letter related to geotechnical issues as it pertains to the Site is required to be completed under a separate cover.
- An agreement to discharge into the sewers owned by the Regional Municipality of Peel will be required.
- The EASR registration allows construction dewatering discharge of up to 400,000 L/day. A Discharge Plan (dewatering sketch, sewer discharge agreement) must be developed and applied for any discharges from the Site. The Discharge Plan and monitoring for both water quantity and water quality must be carried at the Site during the entire construction dewatering phase. The daily water taking records must be maintained onsite for the entire construction dewatering phase. The EASR, Discharge Plan, hydrogeological investigation report, and geotechnical assessment of settlements must always also be available at the construction Site for the entire construction dewatering. EXP should be notified immediately about any changes to the construction dewatering schedule or design, since EASR will need to be updated to

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reflect these modifications. The hydrogeological report, EASR, Discharge Plan and geotechnical assessment constitutes the Water Taking Plan which needs to be available onsite for the duration of construction dewatering.

- In conformance with Regulation 903 of the Ontario Water Resources Act, the installation and eventual decommissioning of any dewatering system wells or monitoring wells must be completed by a licensed well contractor. This will be required for all wells that are no longer in use.

The conclusions and recommendations provided above should be reviewed in conjunction with the entirety of the report. They assume that the present design concept described throughout the report will proceed to construction. This report is solely intended for the construction and long-term dewatering assessments. Any changes to the design concept may result in a modification to the recommendations provided in this report.

7 Limitations

This report is based on a limited investigation designed to provide information to support an assessment of the current hydrogeological conditions within the study area. The conclusions and recommendations presented within this report reflect Site conditions existing at the time of the assessment. EXP must be contacted immediately, if any unforeseen Site conditions are experienced during construction activities. This will allow EXP to review the new findings and provide appropriate recommendations to allow the construction to proceed in a timely and cost-effective manner.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience/engineering profession. No other warranty or representation, either expressed or implied, is included or intended in this report.

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We trust that this information is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

EXP Services Inc.



Jay Samarakkody, M. Phil., P. Geo.
 Senior Hydrogeologist
 Environmental Services



Francois Chartier, M.Sc., P. Geo.
 Discipline Manager, Hydrogeology
 Environmental Services

8 References

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Figures



SCALE:

0 150 300 450 600 750 m

LEGEND:

APPROXIMATE SITE BOUNDARY

SITE LOCATION PLAN

FIGURE:

1

HYDROGEOLOGICAL INVESTIGATION
84, 90 HIGH STREET EAST AND
17, 19 ANN STREET
MISSISSAUGA, ONTARIO

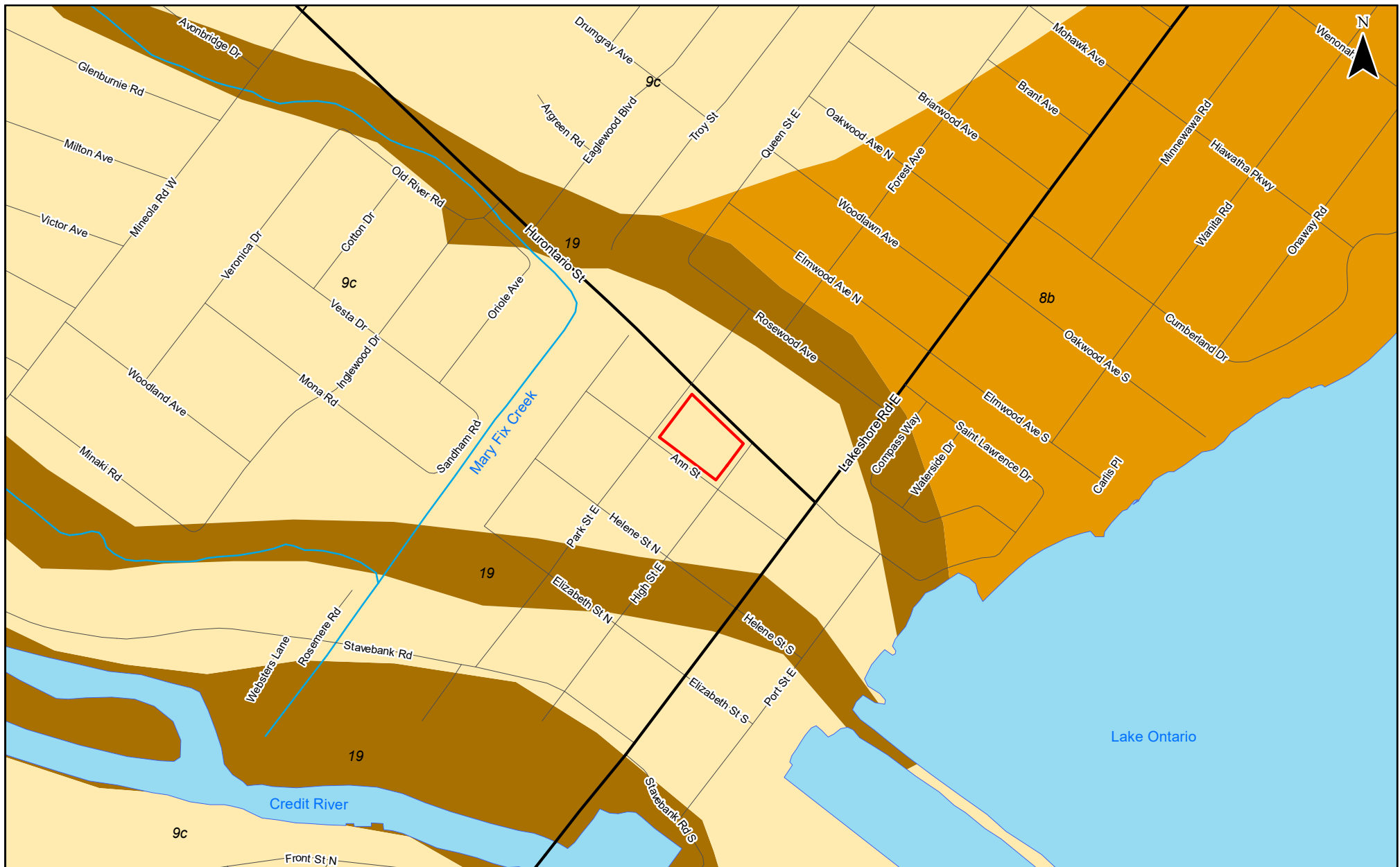
PROJECT NUMBER: BRM-00239423-E0

DATE: SEPTEMBER 2021



DRAWN BY:
AC

CHECKED BY:
JS



SCALE:
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SOURCE:
BASED ON ONTARIO GEOLOGICAL SURVEY DATA PUBLISHED IN 2010

LEGEND:

- APPROXIMATE SITE BOUNDARY
- 19: MODERN ALLUVIAL DEPOSITS
- 9C: COARSE-TEXTURED (FORESHORE-BASINAL) GLACIOLACUSTRINE DEPOSITS
- 8B: INTERBEDDED FLOW TILL, RAINOUT DEPOSITS AND SILT AND CLAY

SURFICIAL GEOLOGY

FIGURE:
2

HYDROGEOLOGICAL INVESTIGATION
84, 90 HIGH STREET EAST AND
17, 19 ANN STREET
MISSISSAUGA, ONTARIO

PROJECT NUMBER: BRM-00239423-E0

DATE: SEPTEMBER 2021



DRAWN BY:
AC

CHECKED BY:
JS



SCALE:
0 100 200 300 400 500 m

SOURCE:
BASED ON GOOGLE EARTH IMAGERY DATED 2020,
AVAILABLE WELL RECORD INFORMATION AS OF SEPTEMBER 2019

exp.

DRAWN BY:
AC

CHECKED BY:
JS

LEGEND:

- MONITORING WELL / TEST HOLE
- ABANDONED WELL
- UNCLASSIFIED / UNFINISHED WELL
- APPROXIMATE SITE BOUNDARY
- 500 m ZONE

MECP WATER WELL
RECORDS MAP

FIGURE:
3

HYDROGEOLOGICAL INVESTIGATION
84, 90 HIGH STREET EAST AND
17, 19 ANN STREET
MISSISSAUGA, ONTARIO

PROJECT NUMBER: BRM-00239423-E0

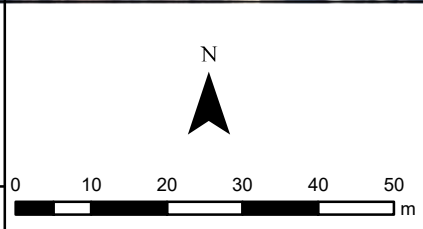
DATE: SEPTEMBER 2021



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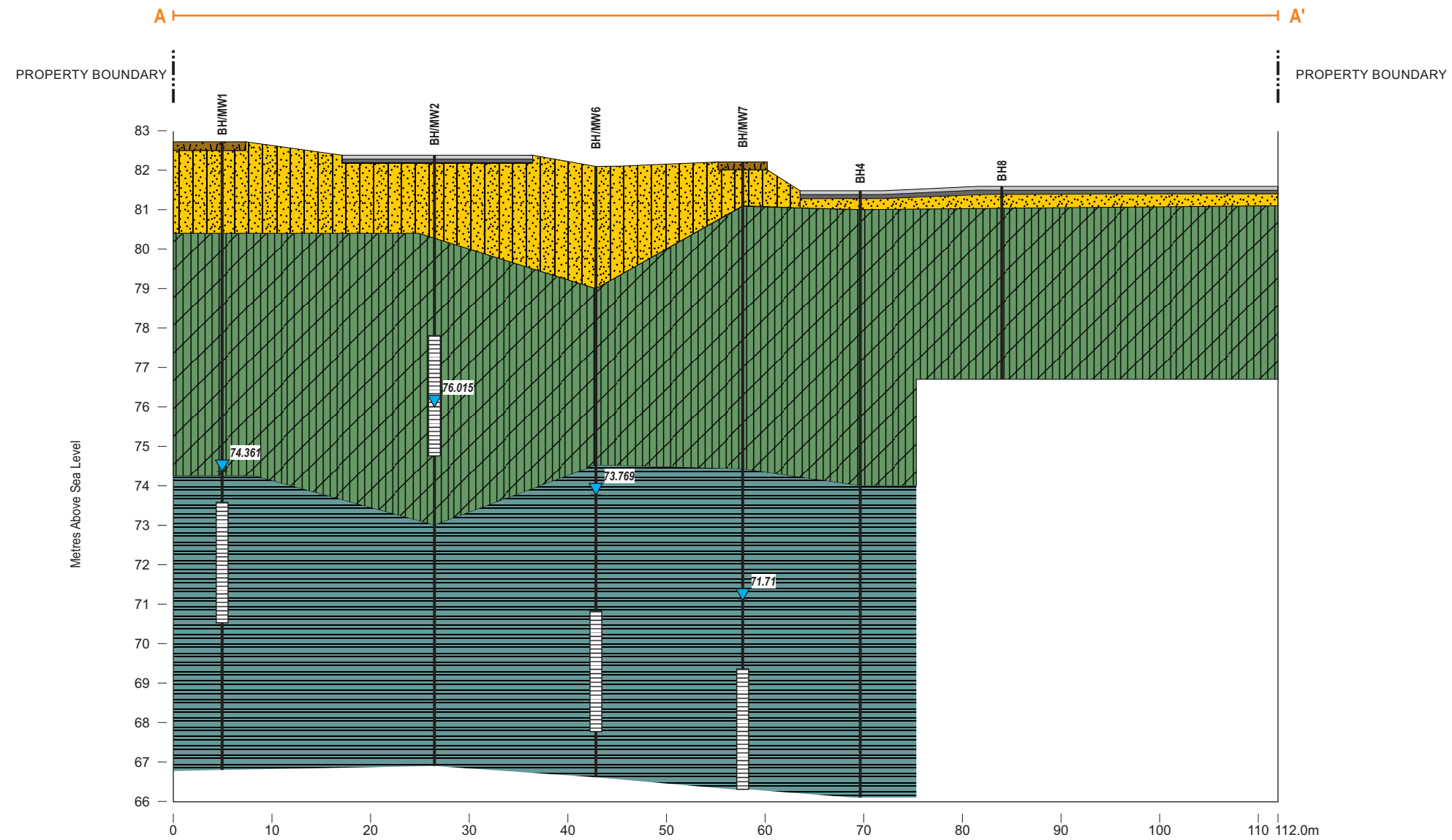
• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
 • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •



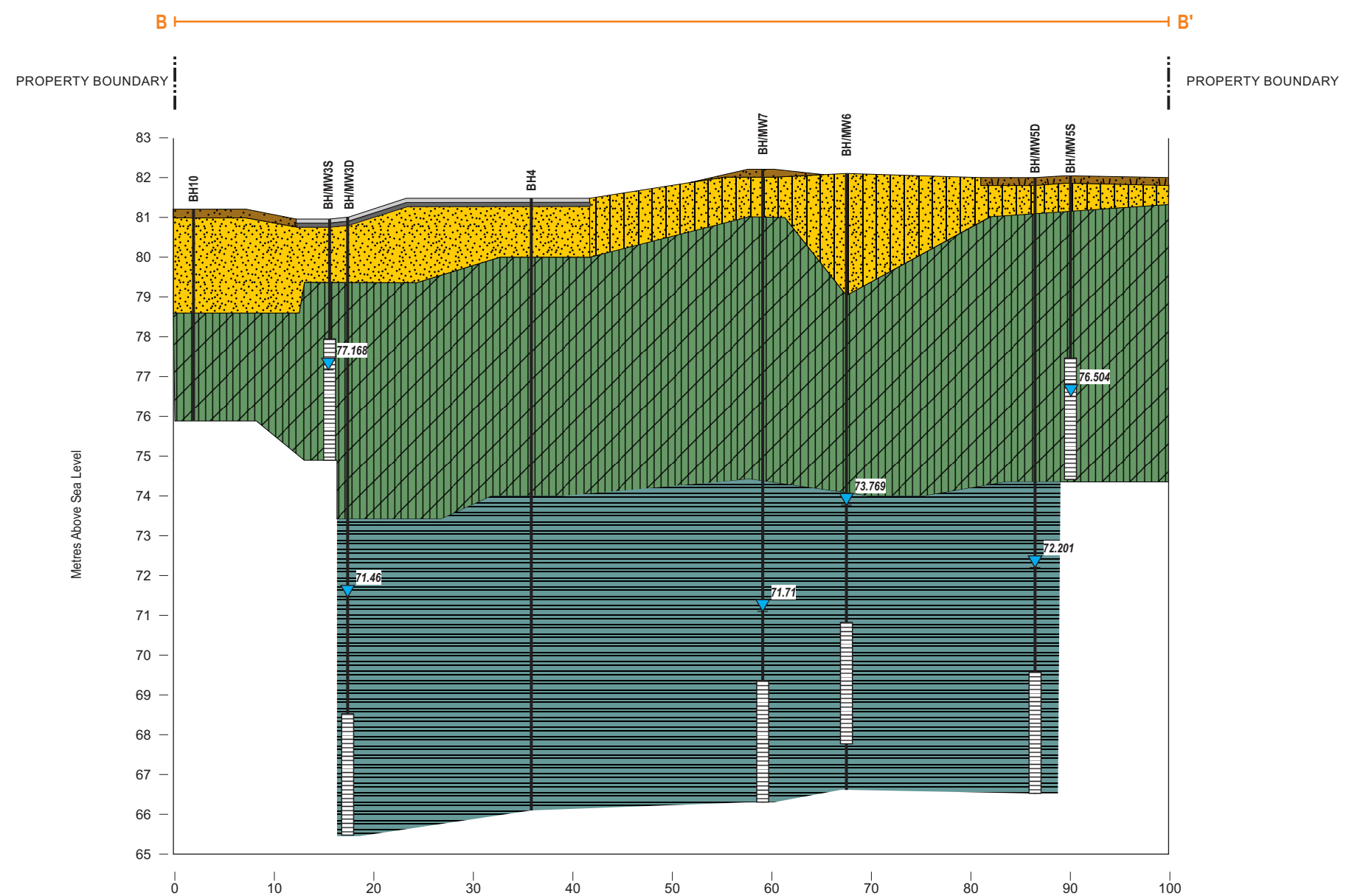
TITLE AND LOCATION:
**BOREHOLE / MONITORING WELL
 LOCATION PLAN**

84, 90 High Street East and
 17, 19 Ann Street
 Mississauga, Ontario

PROJECT No.: BRM-00239423-E0	OWN: AC
SCALE: AS NOTED	CHRD: SL
DATE: AUGUST 2021	FIG. No.: 4

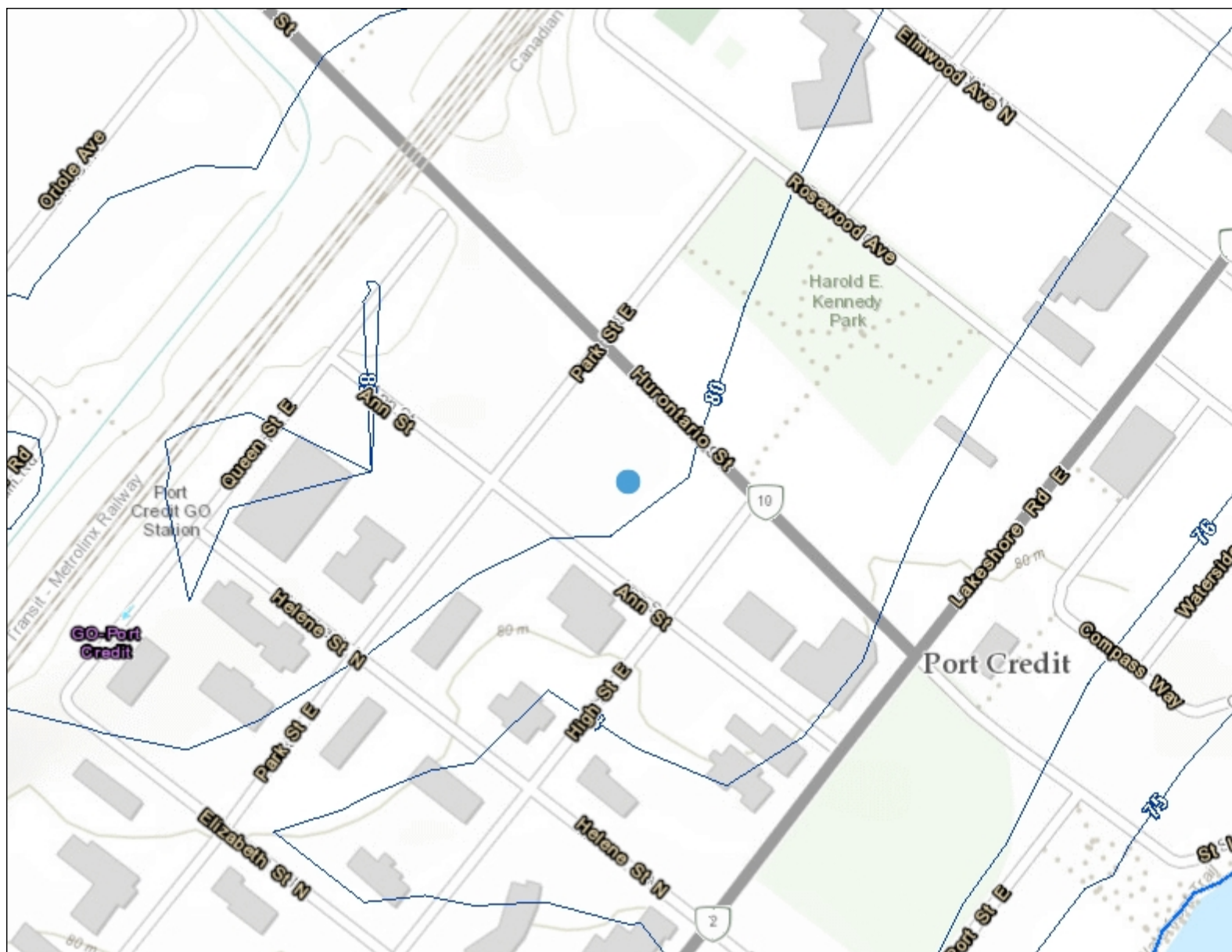


SCALE: 4 X VERTICAL EXAGGERATION			LEGEND: TEST HOLE SCREEN INTERVAL GROUND WATER ELEVATION (masl JULY 15 2021) masl METRES ABOVE SEA LEVEL TOPSOIL ASPHALT GRANULAR BASE SAND TO SANDY SILT TO CLAYEY SILT FILL SANDY SILT A(REWORKED NA CLAYEY SILT TILL SHALE BEDROCK			CROSS SECTION A-A' FIGURE 5A	



SCALE: 4 X VERTICAL EXAGGERATION			LEGEND: TEST HOLE SCREEN INTERVAL GROUND WATER ELEVATION (masl JULY 15 2021) masl METRES ABOVE SEA LEVEL TOPSOIL ASPHALT GRANULAR BASE SAND TO SANDY SILT TO CLAYEY SILT FILL SANDY SILT (REWORKED NATIVE) CLAYEY SILT TILL SHALE BEDROCK			CROSS SECTION B-B'		FIGURE 5B	
SOURCE: BASED ON FIELD OBSERVATIONS BY EXP									
exp. DRAWN BY CHECKED BY K.G. S.L.			84, 90 HIGH STREET EAST AND 17, 19 ANN STREET, MISSISSAUGA, ONTARIO PROJECT NUMBER: BRM-00239423-E0 DATE: AUGUST2021						

Figure 6 - Groundwater Contours



Legend

- ORMGP Boundary
- ORM Plan Boundary
- Niagara Escarpment Plan Boundary
- Water Table Contour (all contours)**
- Contour (1m)
- Contour (2m)
- Contour (5m)
- Contour (10m)
- Contour (25m)
- Contour (50m)
- Shallow Water Table Wells (<20m)
- Water Bodies
- Streams - 100m - Strahler gt3

229.3 0 114.66 229.3 Km

1: 4,514



© Oak Ridges Moraine Groundwater Program, 2021

Map Compiled by the Oak Ridges Moraine Groundwater Program.101 Exchange Avenue, Vaughan, Ontario, M3N 1S4

This map is for information purposes only and the Oak Ridges Moraine Groundwater Program takes no responsibility for, nor guarantees, the accuracy of all the information contained within the map.

Appendix A – MECP WWR Summary Table

Appendix A

MECP Water Well Database Search Results

(Water Wells within 500 m from Site Centroid)

Off-Site																
BORE HOLE ID	WELL ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE FROM SITE CENTROID (m)	CONSTRUCTION METHOD	WELL DEPTH (m bgs)	WATER FOUND (m bgs)	CASING DIA. (cm)	1st USE	2nd USE	FINAL STATUS
11177129	4909501	6/14/2004	614220	4823140	80.1	margin of error : 10 - 30 m	10 STAREBANK	MISSISSAUGA	442	Boring	6.0	4.0	5.0			Observation Wells
1001703970	7109074	7/10/2008	614466	4823265	78.7	margin of error : 10 - 30 m	113 LAKESHORE BLVD. 107	Mississauga	292	Geoprobe	4.9		3.8	Monitoring		
1001703973	7109075	7/10/2008	614601	4823210	76.8	margin of error : 10 - 30 m	113 LAKESHORE BLVD. 107	Mississauga	397	Geoprobe	4.9		3.8	Monitoring		
1001944777	7117362	7/5/2008	614306	4823065	78.2	margin of error : 30 m - 100 m	31 LAKE SHORE RD E	PORT CREDIT	489	Boring	4.5	1.3	5.1	Monitoring		Test Hole
1002741237	7118824	7/10/2008	614313	4823059	78.2	margin of error : 30 m - 100 m	2850 KINGSTON RD.	Toronto	494	BORING	8.0	5.3	5.1	Monitoring		Other Status
1002796577	7133398	9/25/2009	614472	4823265	78.5	margin of error : 10 - 30 m	113 LAKESHORE RD. E. #107	Mississauga	293	Boring	4.6			Monitoring		Observation Wells
1003169217	7148417	6/10/2010	614459	4823157	78.9	margin of error : 30 m - 100 m	LAKESHORE 91/99	Mississauga	396	Direct Push	4.6		3.8	Monitoring and Test Hole		Monitoring and Test Hole
1003169219	7148418	6/10/2010	614443	4823200	79.8	margin of error : 30 m - 100 m	LAKE SHORE 91/99	Mississauga	351	Direct Push	4.6		3.8	Monitoring and Test Hole		Test Hole
1003169221	7148419	6/10/2010	614446	4823232	79.5	margin of error : 30 m - 100 m	LAKE SHORE 91/99		320	Direct Push	4.6		3.8	Monitoring and Test Hole		
1003169223	7148420	6/10/2010	614445	4823301	79.0	margin of error : 30 m - 100 m	LAKESHORE 91/99	Mississauga	252	Direct Push	3.4		3.2	Monitoring and Test Hole		Monitoring and Test Hole
1003456013	7157715	12/3/2010	614451	4823250	79.1	margin of error : 10 - 30 m	103 LAKESHORE ROAD EAST	Mississauga	303	DIRECT PUSH	1.8		3.2	Monitoring and Test Hole		Monitoring and Test Hole
1003456088	7157716	12/3/2010	614459	4823240	79.1	margin of error : 10 - 30 m	103 LAKESHORE ROAD EAST	Mississauga	314	DIRECT PUSH	5.5		1.9	Monitoring and Test Hole		Monitoring and Test Hole
1003456090	7157717	12/3/2010	614453	4823241	79.2	margin of error : 10 - 30 m	103 LAKESHORE ROAD EAST	Mississauga	312	DIRECT PUSH	3.7		1.9	Monitoring and Test Hole		Monitoring and Test Hole
1003507031	7162960	4/28/2011	614404	4823047	77.5	margin of error : 10 - 30 m	30 PORT ST E	MISSISSAUGA	500	Rotary (Convent.)	4.6		5.1	Test Hole		Test Hole
1003558156	7168027	7/24/2011	614210	4823161	81.1	margin of error : 10 - 30 m	20 STAVEBANK DR	MISSISSAUGA	426	Direct Push	6.1		5.1	Monitoring and Test Hole		Monitoring and Test Hole
1003593178	7170695	10/5/2011	614493	4823946	83.7	margin of error : 10 - 30 m	137 QUEEN STREET EAST	MISSISSAUGA	412	DIRECT PUSH	3.0		3.2	Monitoring and Test Hole		Monitoring and Test Hole
1003593180	7170696	10/5/2011	614477	4823938	83.8	margin of error : 10 - 30 m	137 QUEEN STREET EAST	MISSISSAUGA	400	DIRECT PUSH	3.7		2.5	Monitoring and Test Hole		Monitoring and Test Hole
1003962303	7183548	5/30/2012	614452	4823228	79.4	margin of error : 30 m - 100 m	103 LAKESHORE RD E	MISSISSAUGA	325	Direct Push	4.5		4.0	Monitoring and Test Hole		Monitoring and Test Hole
1003962314	7183549	5/30/2012	614447	4823231	79.4	margin of error : 30 m - 100 m	103 LAKESHORE RD E	MISSISSAUGA	321	DIRECT PUSH	4.5		4.0	Monitoring and Test Hole		Monitoring and Test Hole
1004160474	7187652	9/13/2012	614310	4823026	77.1	margin of error : 30 m - 100 m	31 LAKESHORE RD E	Mississauga	527	Rotary (Convent.)	8.2		5.1	Monitoring		
1004163417	7187901	8/17/2012	614453	4823240	79.2	margin of error : 30 m - 100 m	103 LAKESHORE RD E	Mississauga	313	Direct Push	4.6		5.1	Monitoring and Test Hole		Test Hole
1004163420	7187902	8/17/2012	614455	4823285	78.8	margin of error : 30 m - 100 m	103 LAKESHORE RD E	Mississauga	270	Direct Push	4.6		5.1	Monitoring and Test Hole		Test Hole
1004163423	7187903	8/17/2012	614458	4823237	79.2	margin of error : 30 m - 100 m	103 LAKESHORE RD E	Mississauga	317	Direct Push	4.6		5.1	Monitoring and Test Hole		Observation Wells
1004164005	7187967	8/28/2012	614480	4823067	75.5	margin of error : 30 m - 100 m	130 LAKESHORE RD	Mississauga	488	Direct Push	4.6		4.1	Monitoring and Test Hole		Observation Wells
1004195958	7183814	5/30/2012	614424	4823252	79.4	margin of error : 30 m - 100 m	103 LAKESHORE RD E	MISSISSAUGA	297	DIRECT PUSH	1.4		3.5	Monitoring and Test Hole		Test Hole
1004629409	7211007	5/6/2013	614402	4823210	80.1	margin of error : 30 m - 100 m	99 LAKESHORE RD	PORT CREDIT	337	Boring	12.1		5.2	Monitoring		Observation Wells
1004629426	7211008	5/6/2013	614470	4823177	78.8	margin of error : 30 m - 100 m	99 LAKESHROE RD	PORT CREDIT	378	Boring	12.1		5.2	Monitoring		Observation Wells
1004629597	7211009	5/6/2013	614464	4823214	79.3	margin of error : 30 m - 100 m	99 LAKESHORE RD	PORT CREDIT	341	Boring	12.1		5.2	Monitoring		Observation Wells
1004731231	7219153	10/18/2013	614009	4823206	82.4	margin of error : 30 m - 100 m	PARK ST. E & STAVEBANK RD. MEMORIAL PARK	PORT CREDIT	512	Auger	6.7	3.7	5.1	Monitoring and Test Hole		Test Hole
1001585176	7104773	4/22/2008	614444	4823579	82.7	margin of error : 10 - 30 m	15 HURNOTARIP STREET	MISSISSAUGA	62	AUGERING						Abandoned-Other
1003558158	7168028	7/24/2011	614176	4823129	78.1	margin of error : 10 - 30 m	20 STAVEBANK DR	MISSISSAUGA	470	Direct Push			5.1	Monitoring and Test Hole		Monitoring and Test Hole
1003558160	7168029	7/24/2011	614187	4823150	80.3	margin of error : 10 - 30 m	20 STAVEBANK DR	MISSISSAUGA	446	Direct Push			5.1	Monitoring and Test Hole		Monitoring and Test Hole
1005117760	7226930	7/24/2014	614301	4823031	77.1	margin of error : 30 m - 100 m	31 LAKESHORE BLVD. E	MISSISSAUGA	524	Direct Push			5.2	Monitoring and Test Hole		Abandoned Monitoring and Test Hole
11323476	4909743	3/16/2005	614016	4823262	81.4	margin of error : 30 m - 100 m		PORT CREDIT	471	Other Method	7.9		5.0			Observation Wells
11323505	4909772	4/5/2005	614239	4823024	76.4	margin of error : 30 m - 100 m	PORT CREDIT MEMORIAL PARK	PORT CREDIT	545	Other Method	6.7		5.0			Observation Wells
23046642	7046642	6/26/2007	614363	4823171	80.1	margin of error : 10 - 30 m	15 STAVEBANK ROAD SOUTH	MISSISSAUGA	377	Other Method	5.8		3.8			Observation Wells
1003431946	7155591	7/23/2010	614504	4823603	81.3	margin of error : 10 - 30 m	150 LAKESHORE BLVD. EAST	Mississauga	126	Boring	5.7		5.1	Monitoring		Test Hole
1006147364	7155591	7/10/2010	614519	4823619		margin of error : 10 - 30 m	150 LAKESHORE BLVD. EAST	Mississauga	147	BORING	5.7		5.1	Monitoring		Test Hole
11323584	4909851	6/23/2005	614244	4823025	76.4	margin of error : 30 m - 100 m	STAVEBANK RD	PORT CREDIT	542				5.1	Not Used		Abandoned-Other
11323589	4909856	6/23/2005	614278	4823133	79.6	margin of error : 30 m - 100 m	STAVEBANK RD	PORT CREDIT	429				5.1	Not Used		Abandoned-Other
10322479	4907920	10/7/1994	614631	4823640	80.2	margin of error : 10 - 30 m			257	Rotary (Convent.)	5.8	5.2		Not Used		Observation Wells
10322480	4907921	10/7/1994	614580	4823610	79.9	margin of error : 10 - 30 m			199	Rotary (Convent.)	7.0	5.5		Not Used		Observation Wells
10322481	4907922	10/7/1994	614620	4823634	80.1	margin of error : 10 - 30 m			245	Rotary (Convent.)	4.3	4.0		Not Used		Observation Wells
10322482	4907923	10/7/1994	614650	4823633	80.3	margin of error : 10 - 30 m			273	Rotary (Convent.)	7.0	6.7		Not Used		Observation Wells
1005290217	7235986	12/12/2014	614550	4824034	85.1	margin of error : 100 m - 300 m	55 OAKWOOD AVE N	Mississauga	512	Boring	5.8			Monitoring		
1005439505	7243496	6/6/2015	614141	4823554	84.6	margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	250	Boring	6.1	3.7		Monitoring		Observation Wells
1006290124	7274683	8/19/2016	614559	4823014	75.7	margin of error : 30 m - 100 m	1 PORT ST E	PORT CREDIT	559	Boring	2.9			Monitoring		Observation Wells
1006290127	7274684	8/24/2016	614588	4823145	75.9	margin of error : 30 m - 100 m	1 PORT ST E	Mississauga	448	Boring	3.9			Monitoring		Observation Wells
1006290130	7274685	8/25/2016	614497	4823146	77.9	margin of error : 30 m - 100 m	1 PORT ST E	Mississauga	415	Boring	3.9			Monitoring		Observation Wells
1006290133	7274686	8/25/2016	614515	4823107	75.3	margin of error : 30 m - 100 m	1 PORT ST E	Mississauga	457	Boring	3.9			Monitoring		Observation Wells
1006290280	7274735	8/24/2016	614543	4823152	76.2	margin of error : 30 m - 100 m	11 PORT ST E	Mississauga	423	Not Known	3.9			Monitoring		Observation Wells
1006322615	7278218	12/6/2016	614135	4823255	80.5	margin of error : 30 m - 100 m	21 PARK ST E	PORT CREDIT	388	Boring	14.9			Monitoring		Observation Wells

Appendix A

MECP Water Well Database Search Results

(Water Wells within 500 m from Site Centroid)

Off-Site																
BORE HOLE ID	WELL ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE FROM SITE CENTROID (m)	CONSTRUCTION METHOD	WELL DEPTH (m bgs)	WATER FOUND (m bgs)	CASING DIA. (cm)	1st USE	2nd USE	FINAL STATUS
1006322618	7278219	12/2/2016	614148	4823274	79.2	margin of error : 30 m - 100 m	27 PARK ST E	PORT CREDIT	366	Boring	7.5			Monitoring		Observation Wells
1006322621	7278220	12/2/2016	614141	4823252	80.5	margin of error : 30 m - 100 m	21 PARK ST E	PORT CREDIT	387	Boring	9.1			Monitoring		Observation Wells
1006367884	7282790	2/9/2017	614616	4823581	79.8	margin of error : 30 m - 100 m	158 LAKESHORE RD E	Mississauga	227		2.1					
1006367890	7282792	2/9/2017	614610	4823575	79.7	margin of error : 30 m - 100 m	158 LAKESHORE RD E	Mississauga	221		2.1					
1006383141	7284674	3/29/2017	614168	4823817	82.9	margin of error : 30 m - 100 m	HURONTARIO ST	Mississauga	350	Boring	7.6	5.7		Monitoring		Observation Wells
1006383150	7284676	3/30/2017	614123	4823831	82.3	margin of error : 30 m - 100 m	ORIOLE AVE	Mississauga	391	Boring	13.1	6.4		Monitoring		Observation Wells
1006383168	7284678	3/30/2017	614132	4823844	82.4	margin of error : 30 m - 100 m	50M SOUTH OF INGLEWOOD DR .5 M WEST OF HURONTARIO WEST CURB LINE	Mississauga	394	Boring	14.0			Monitoring		Observation Wells
1006429573	7286063	4/5/2017	614139	4823814	82.3	margin of error : 30 m - 100 m	ORIOLE AVE	Mississauga	367	Boring	15.0	6.0		Monitoring		Observation Wells
1006481726	7287213	4/12/2017	614695	4823639	80.4	margin of error : 30 m - 100 m	170 LAKESHORE ROAD EAST	Oakville	317	Boring	6.1			Monitoring		Observation Wells
1006488361	7287343	4/12/2017	613890	4823317	79.2	margin of error : 30 m - 100 m	ROSEMERE ROAD	Mississauga	551	Boring	6.1			Monitoring		Observation Wells
1006488364	7287344	4/12/2017	613889	4823316	79.2	margin of error : 30 m - 100 m	ROSEMERE ROAD	Mississauga	553	Diamond	13.7			Monitoring		Observation Wells
1006629963	7290466	5/19/2017	614716	4823737	82.0	margin of error : 30 m - 100 m	3 ELMWOOD AVE N	Mississauga	376	Boring	6.9			Monitoring		Observation Wells
1006629977	7290467	5/18/2017	614703	4823692	81.4	margin of error : 30 m - 100 m	3 ELMWOOD AVE N	Mississauga	344	Boring	6.9			Monitoring		Observation Wells
1006630452	7290468	5/18/2017	614703	4823692	81.4	margin of error : 30 m - 100 m	3 ELMWOOD AVE N	Mississauga	344	Boring	5.7			Monitoring		Observation Wells
1006630455	7290469	5/3/2017	614240	4823714	84.5	margin of error : 30 m - 100 m	NORTH OF TRACKS NEAR ORICLE AVE	Mississauga	225	Boring	10.1			Monitoring		Test Hole
1006630636	7290480	5/26/2017	614256	4823696	84.5	margin of error : 30 m - 100 m	30 QUEEN ST E	Mississauga	201	Boring	11.9			Monitoring		Observation Wells
1006630824	7290487	5/24/2017	614303	4823670	83.1	margin of error : 30 m - 100 m	30 QUEEN ST E	Mississauga	151	Boring	13.2			Monitoring		Observation Wells
1006630840	7290488	5/23/2017	614236	4823700	84.6	margin of error : 30 m - 100 m	46 ORIOLE AVE	Mississauga	218	Boring	13.5			Monitoring		Observation Wells
1006758607	7296574	8/31/2017	614121	4823284	78.7	margin of error : 30 m - 100 m	29 PARK ST. EAST	MISSISSAUGA	377	DIRECT PUSH	2.4			Test Hole	Monitoring	Monitoring and Test Hole
1006758610	7296575	8/30/2017	614193	4823284	78.3	margin of error : 30 m - 100 m	29 PARK ST. EAST	MISSISSAUGA	329	DIRECT PUSH	7.3			Test Hole	Monitoring	Monitoring and Test Hole
1006784926	7298078	8/11/2017	614556	4823530	79.4	margin of error : 30 m - 100 m	1 HURONTARIO STREET	Mississauga	166	Boring	5.2	2.4		Monitoring		Observation Wells
1006785449	7298174	9/20/2017	614615	4823529	79.6	margin of error : 30 m - 100 m	150 LAKESHORE ROAD EAST WELL LOCATED ON ROAD	Mississauga	225	Boring	4.1			Monitoring		Observation Wells
1006785452	7298175	9/20/2017	614606	4823516	79.4	margin of error : 30 m - 100 m	150 LAKESHORE ROAD EAST WELL LOCATED ON ROAD	Mississauga	217	Boring	4.5	3.6		Monitoring		Observation Wells
1006911304	7301773	10/12/2017	614613	4823562	79.7	margin of error : 10 - 30 m	152 LAKESHORE RD E		222	Rotary (Convent.)	4.9			Monitoring		Test Hole
1006995692	7306886	12/8/2017	614060	4823607		margin of error : 30 m - 100 m	1155 VESTA DRIVE	PORT CREDIT	337	Boring	12.5			Monitoring		Observation Wells
1006995695	7306887	12/15/2017	614281	4823683		margin of error : 30 m - 100 m	72 QUEEN STREET	PORT CREDIT	175	Boring	15.2			Test Hole		Observation Wells
1007003204	7307828	1/18/2018	614186	4823711		margin of error : 30 m - 100 m	GO STATION PARKING LOT	PORT CREDIT	263	Boring	8.5	2.6		Test Hole	Monitoring	Observation Wells
1007003609	7307873	1/10/2018	614139	4823585		margin of error : 30 m - 100 m	GO STATION PARKING LOT	PORT CREDIT	255	Boring	1.6			Monitoring		Observation Wells
1007003612	7307874	1/12/2018	614235	4823662		margin of error : 30 m - 100 m	GO STATION PARKING LOT	PORT CREDIT	194	Boring	5.3			Monitoring		Observation Wells
1007008214	7308370	12/20/2017	614291	4823804		margin of error : 30 m - 100 m	32 TROY ST.	MISSISSAUGA	276	Boring	10.9	6.3		Monitoring		Observation Wells
1007008217	7308371	12/19/2017	614063	4823879		margin of error : 30 m - 100 m	1220 HURONTARIO ST.	MISSISSAUGA	467	Boring	11.8			Monitoring		Observation Wells
1007036930	7310439	2/3/2018	614119	4823585		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	275	Boring	12.2			Monitoring		Observation Wells
1007036933	7310440	2/6/2018	614268	4823748		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	236	Boring	17.8			Monitoring		Observation Wells
1007036951	7310446	2/23/2018	614247	4823799		margin of error : 30 m - 100 m	GRASS AREA WEST END OF TROY ST	Mississauga	290	Boring	9.1			Monitoring		Observation Wells
1007036954	7310447	2/22/2018	614240	4823812		margin of error : 30 m - 100 m	GRASS AREA WEST ENF OF TROY ST	Mississauga	305	Boring	7.6			Monitoring		Observation Wells
1007306909	7321737	1/19/2018	614120	4823590		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	275	Boring	15.2			Monitoring		Observation Wells
1007306972	7321758	1/27/2018	614236	4823622		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	ETOBICOKE	172	Boring	12.2			Monitoring		Observation Wells
1007307011	7321771	7/21/2018	614284	4823641		margin of error : 30 m - 100 m	HURONTARIO/ GO TRANSIT TRACKS	ETOBICOKE	143	Boring	7.6			Monitoring		Observation Wells
1007307131	7321811	1/14/2018	614324	4823645		margin of error : 30 m - 100 m	GO STATION PARKING LOT (SOUTH SIDE)	PORT CREDIT	119	Boring	4.6			Monitoring		Observation Wells
1007307134	7321812	1/15/2018	614314	4823645		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	125	Boring	15.2			Monitoring		
1007307137	7321813	1/18/2018	614162	4823527		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	230	Boring	15.2			Monitoring		Observation Wells
1007307140	7321814	1/19/2018	614073	4823449		margin of error : 30 m - 100 m	PORT CREDIT GO STATION	PORT CREDIT	333	Boring	4.5			Monitoring		Observation Wells
1006367887	7282791	2/10/2017	614621	4823583	79.8	margin of error : 30 m - 100 m			233							
1006376769	7284531	3/28/2017	614608	4823609	80.0	margin of error : 30 m - 100 m	158 LAKESHORE RD E	Mississauga	226			1.5				Abandoned Monitoring and Test Hole
1006376921	7284532	3/28/2017	614610	4823569	79.7	margin of error : 30 m - 100 m	158 LAKESHORE RD E	Mississauga	220							Abandoned Monitoring and Test Hole
1006376924	7284533	3/28/2017	614609	4823589	79.8	margin of error : 30 m - 100 m	158 LAKESHORE RD EAST	Mississauga	222			1.5				Abandoned Monitoring and Test Hole
1006376930	7284534	3/28/2017	614616	4823578	79.8	margin of error : 30 m - 100 m	158 LAKESHJORE RD E	Mississauga	227							Abandoned Monitoring and Test Hole
1006376933	7284535	3/28/2017	614619	4823587	79.8	margin of error : 30 m - 100 m	158 LAKESHORE RD E	Mississauga	231							Abandoned-Other

Appendix A
MECP Water Well Batabase Search Results
(Water Wells within 500 m from Site Centroid

Off-Site																
BORE HOLE ID	WELL ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE FROM SITE CENTROID (m)	CONSTRUCTION METHOD	WELL DEPTH (m bgs)	WATER FOUND (m bgs)	CASING DIA. (cm)	1st USE	2nd USE	FINAL STATUS
1006547861	7288429		614407	4823434	79.8	margin of error : 30 m - 100 m	8 ANN ST		114	Boring		1.4		Test Hole		Abandoned-Other
1007353328	7330662	1/18/2019	614135	4823255		margin of error : 30 m - 100 m			388			6.0		Not Used		Abandoned-Other
1007353325	7330661	1/18/2019	614141	4823252		margin of error : 30 m - 100 m			387					Not Used		Abandoned-Other
1007353331	7330663	1/18/2019	614116	4823257		margin of error : 30 m - 100 m			400					Not Used		Abandoned-Other
1003495961	7161795	2/14/2011	614516	4823601	80.7	margin of error : 10 - 30 m			136							
1003505993	7162774	3/15/2011	614591	4823542	79.3	margin of error : 10 - 30 m			200							
1006177173	7267968	6/22/2016	614426	4823445	80.0	margin of error : 30 m - 100 m			108							
1006732093	7295291	3/14/2017	614654	4823635	80.3	margin of error : 30 m - 100 m			277							
1006747711	7296325		614110	4823256	80.2	margin of error : 30 m - 100 m			405							
1007230214	7315579	3/23/2018	614552	4823233		margin of error : 30 m - 100 m			353							
1007451879	7330113	2/19/2019	614244	4823589		margin of error : 30 m - 100 m			153							

Appendix B – Borehole Logs

Log of Borehole 1

Project No. BRM-00239423-E0

Drawing No. 2

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: July 8, 2021

Auger Sample



SPT (N) Value



Dynamic Cone Test



Shelby Tube



Field Vane Test



Combustible Vapour Reading



Natural Moisture



Plastic and Liquid Limit



Undrained Triaxial at



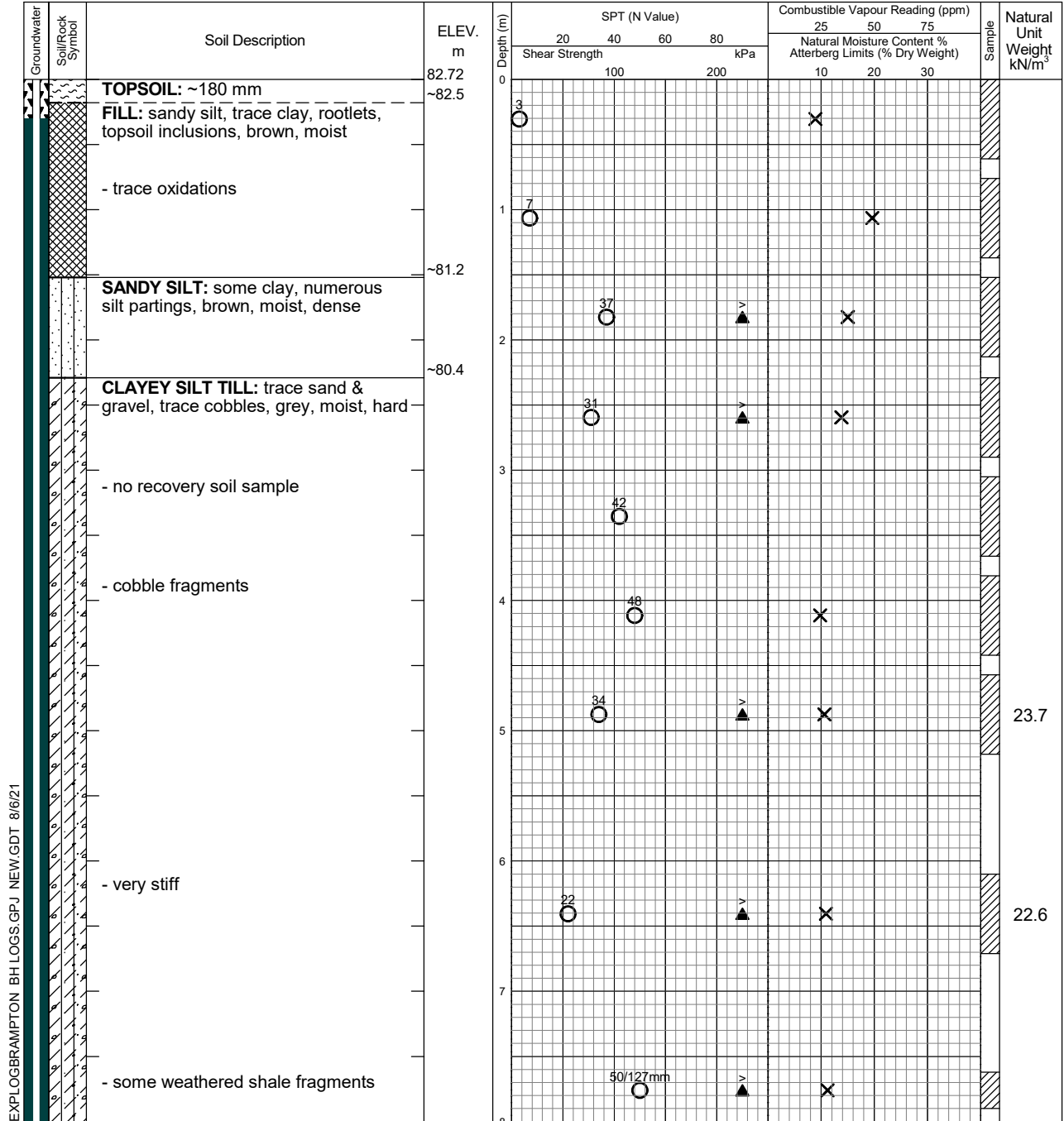
% Strain at Failure



Penetrometer



Datum: Geodetic



Continued Next Page

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.9
July 12, 2021	7.51	
July 14, 2021	8.39	

Log of Borehole 2

Project No. BRM-00239423-E0

Drawing No. 3

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: June 28, 2021

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

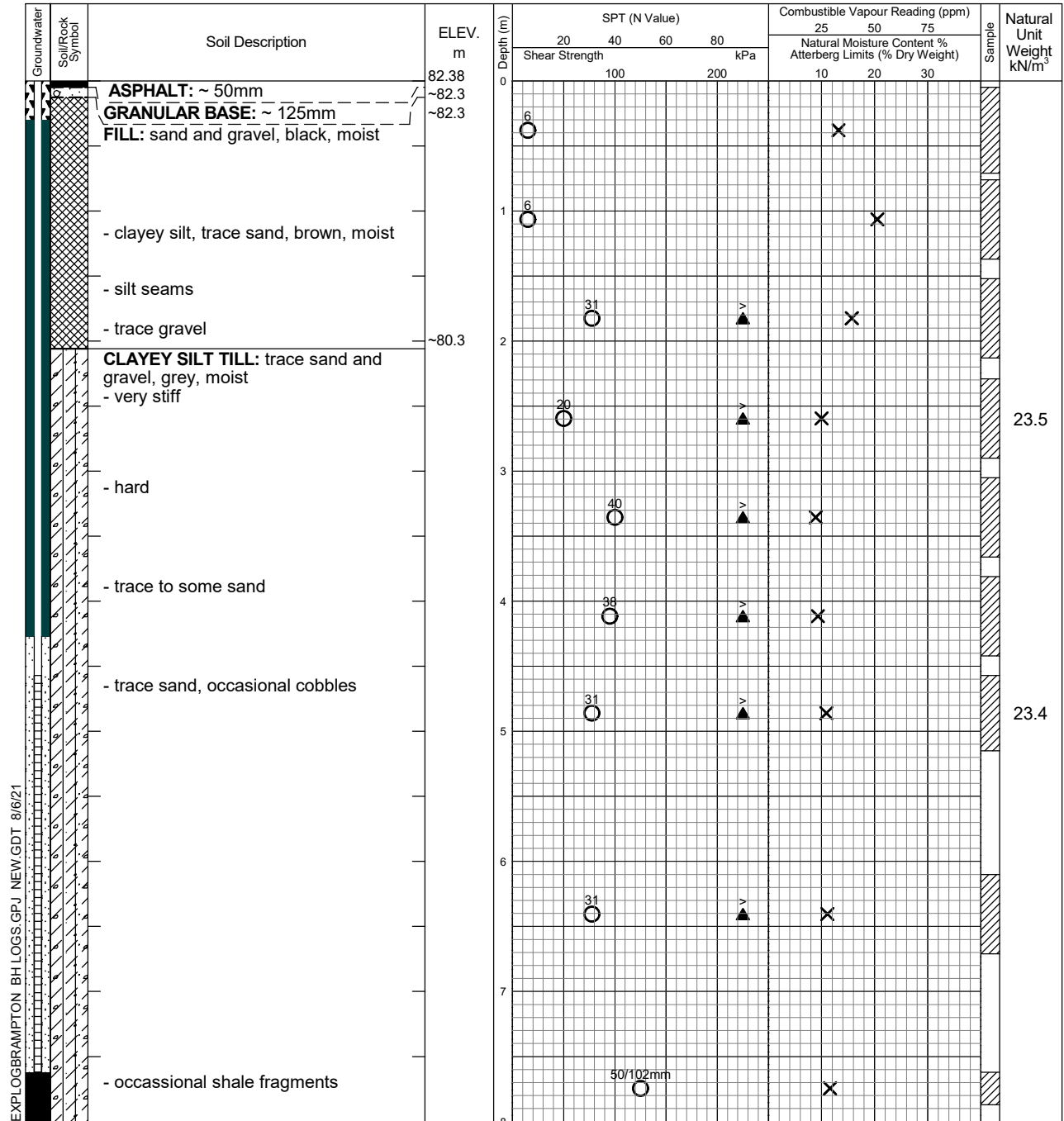
Undrained Triaxial at

% Strain at Failure

Penetrometer

Drill Type: Truck - CME 75

Datum: Geodetic



Continued Next Page

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.4
July 12, 2021	4.76	
July 14, 2021	6.63	

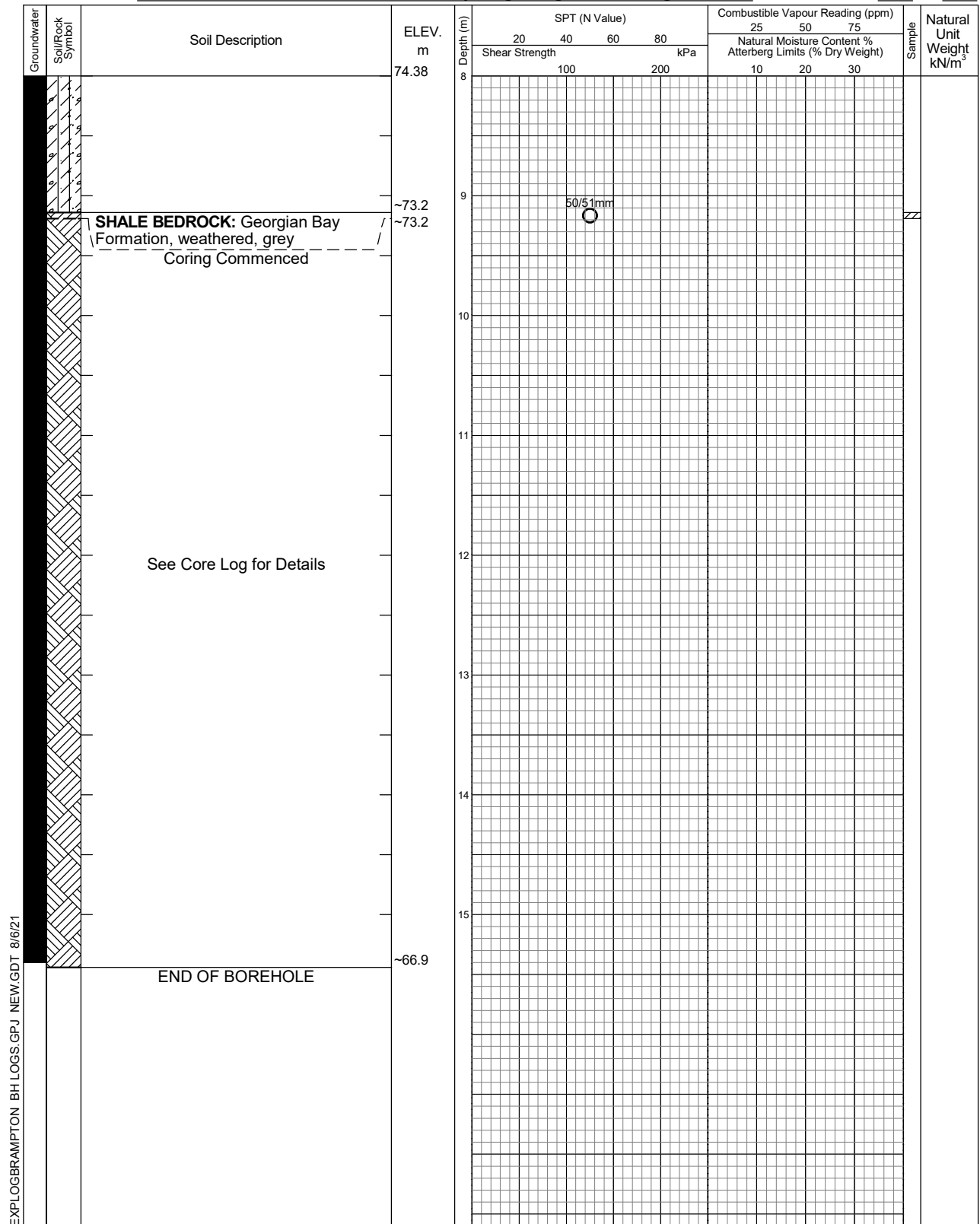
Log of Borehole 2

Project No. BRM-00239423-E0

Drawing No. 3

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 2 of 2



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.4
July 12, 2021	4.76	
July 14, 2021	6.63	

Log of Borehole 3

Project No. BRM-00239423-E0

Drawing No. 4

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: June 29, 2021

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

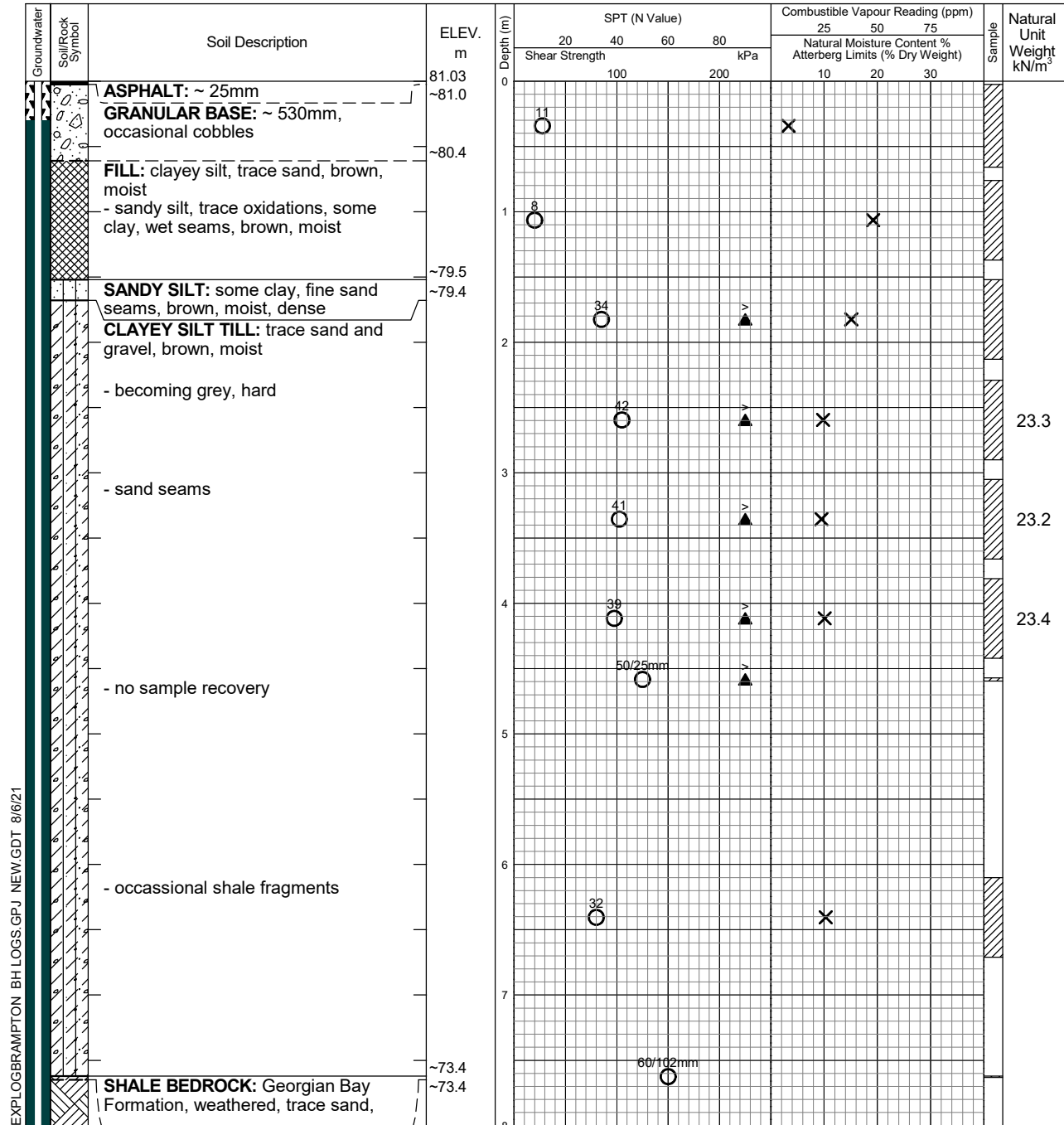
Undrained Triaxial at

% Strain at Failure

Penetrometer

Drill Type: Truck - CME 75

Datum: Geodetic



Continued Next Page



Date	Water Level (m)	Hole Open to (m)
July 12, 2021	9.83	15.69
July 14, 2021	9.75	

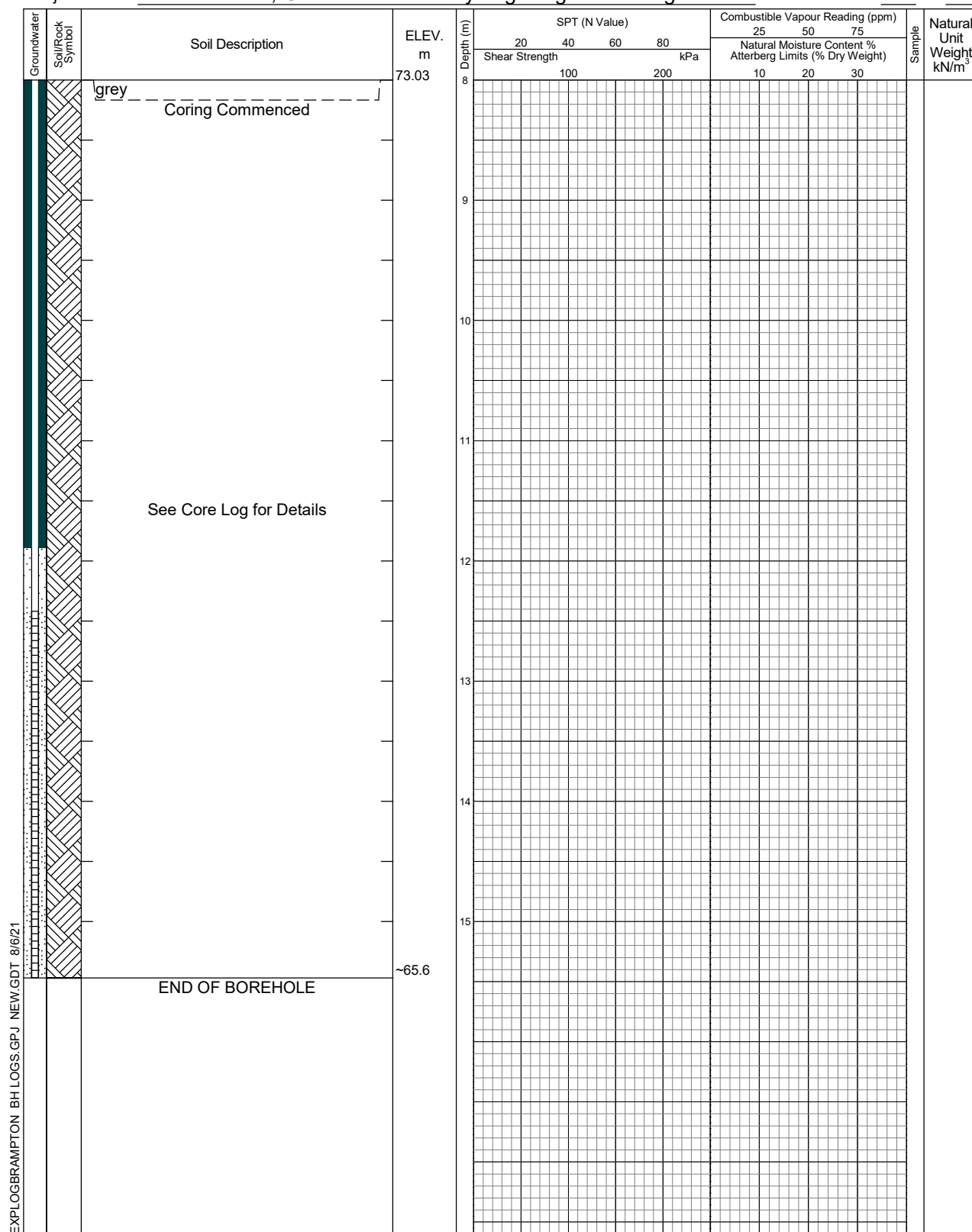
Log of Borehole 3

Project No. BRM-00239423-E0

Drawing No. 4

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 2 of 2



Date	Water Level (m)	Hole Open to (m)
July 12, 2021	9.83	15.69
July 14, 2021	9.75	



Log of Borehole 4

Project No. BRM-00239423-E0

Drawing No. 5

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: June 30, 2021

Auger Sample



SPT (N) Value



Dynamic Cone Test



Shelby Tube



Field Vane Test



Combustible Vapour Reading



Natural Moisture



Plastic and Liquid Limit



Undrained Triaxial at



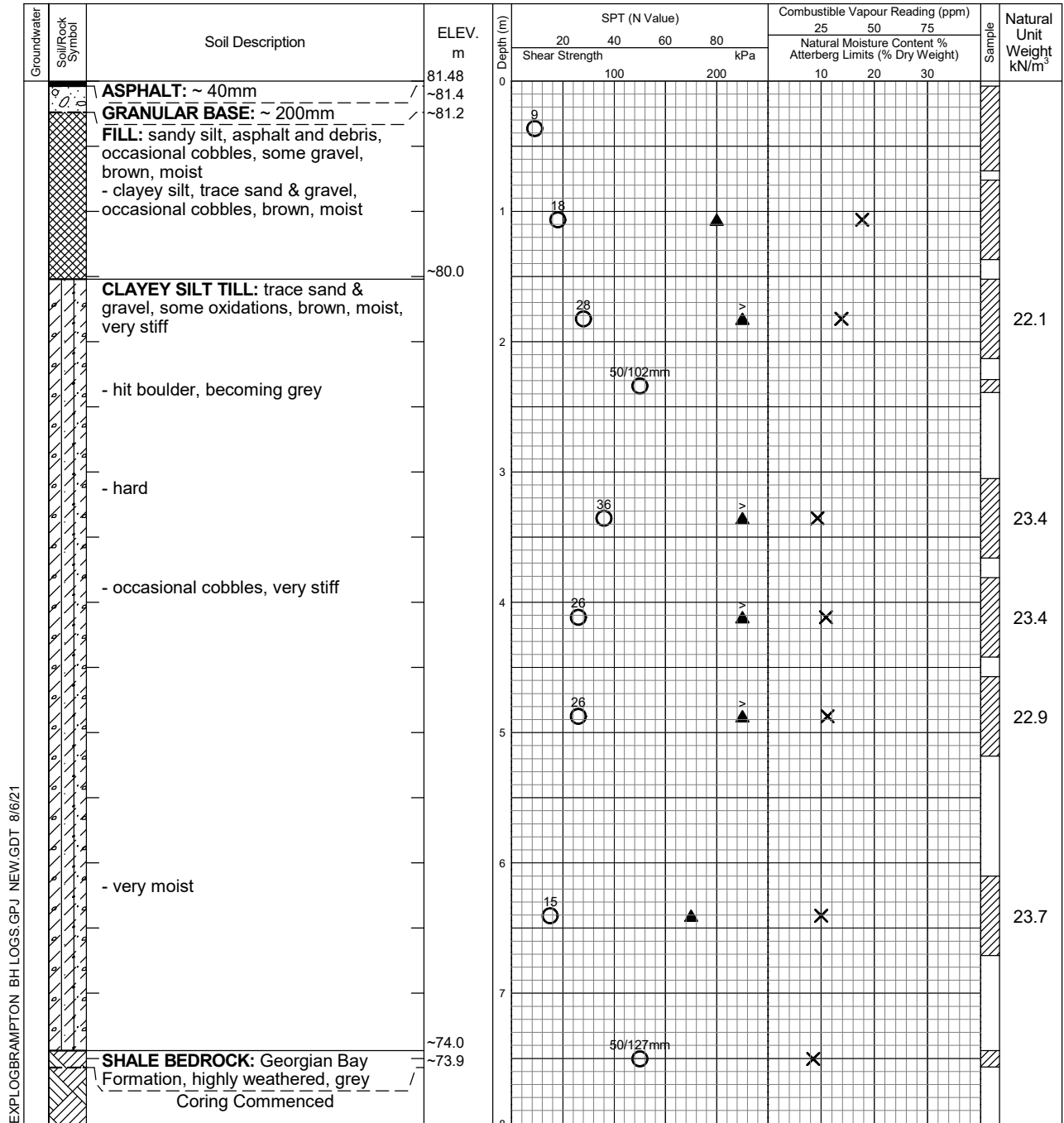
% Strain at Failure



Penetrometer



Datum: Geodetic



Continued Next Page

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)

Log of Borehole 4

Project No. BRM-00239423-E0

Drawing No. 5

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 2 of 2

[illegible]

Date	Water Level (m)	Hole Open to (m)



Log of Borehole 5

Project No. BRM-00239423-E0

Drawing No. 6

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: July 5, 2021

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

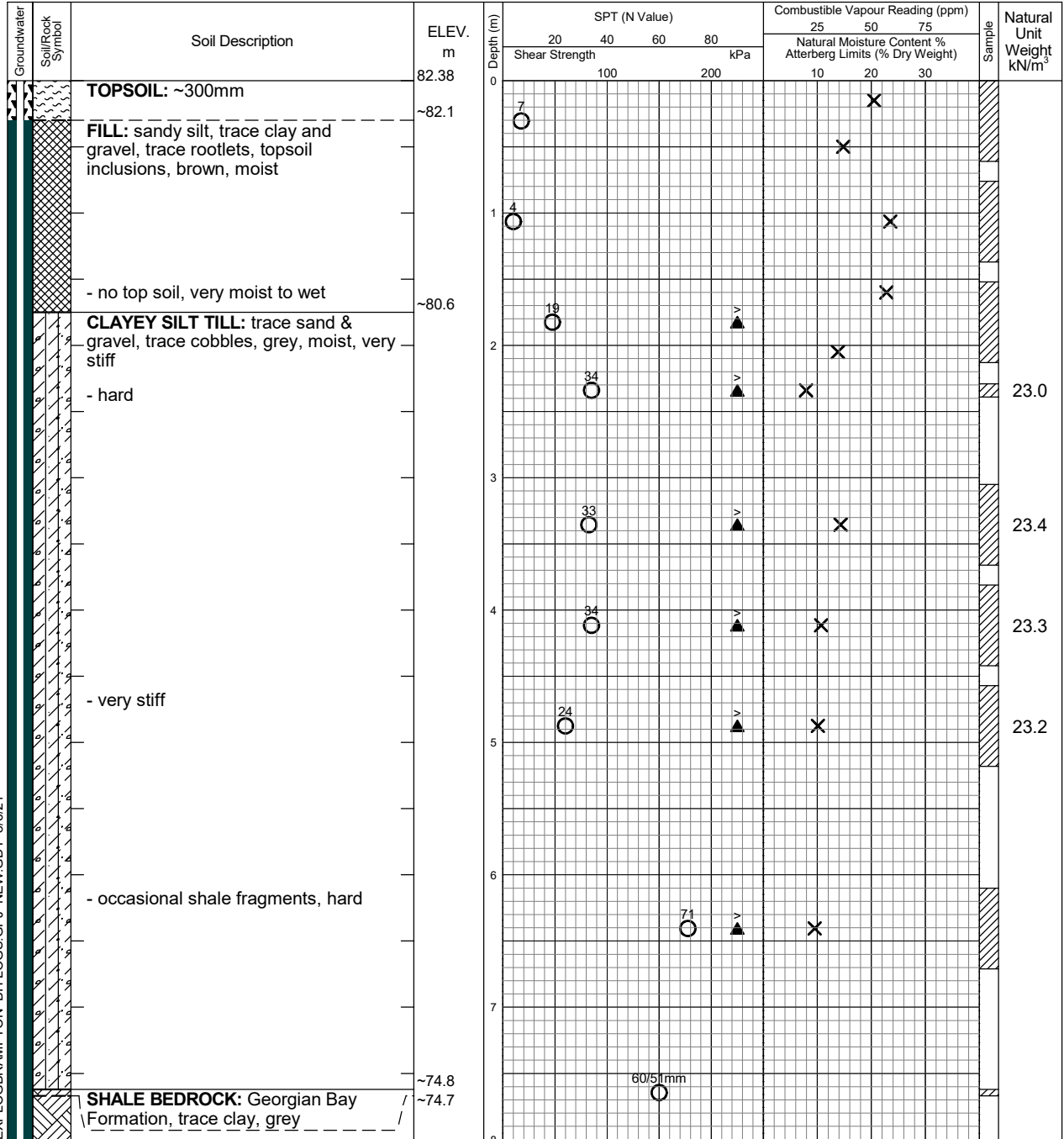
Undrained Triaxial at

% Strain at Failure

Penetrometer

Drill Type: Truck - CME 75

Datum: Geodetic



Continued Next Page



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.47
July 12, 2021	7.96	
July 14, 2021	11.19	

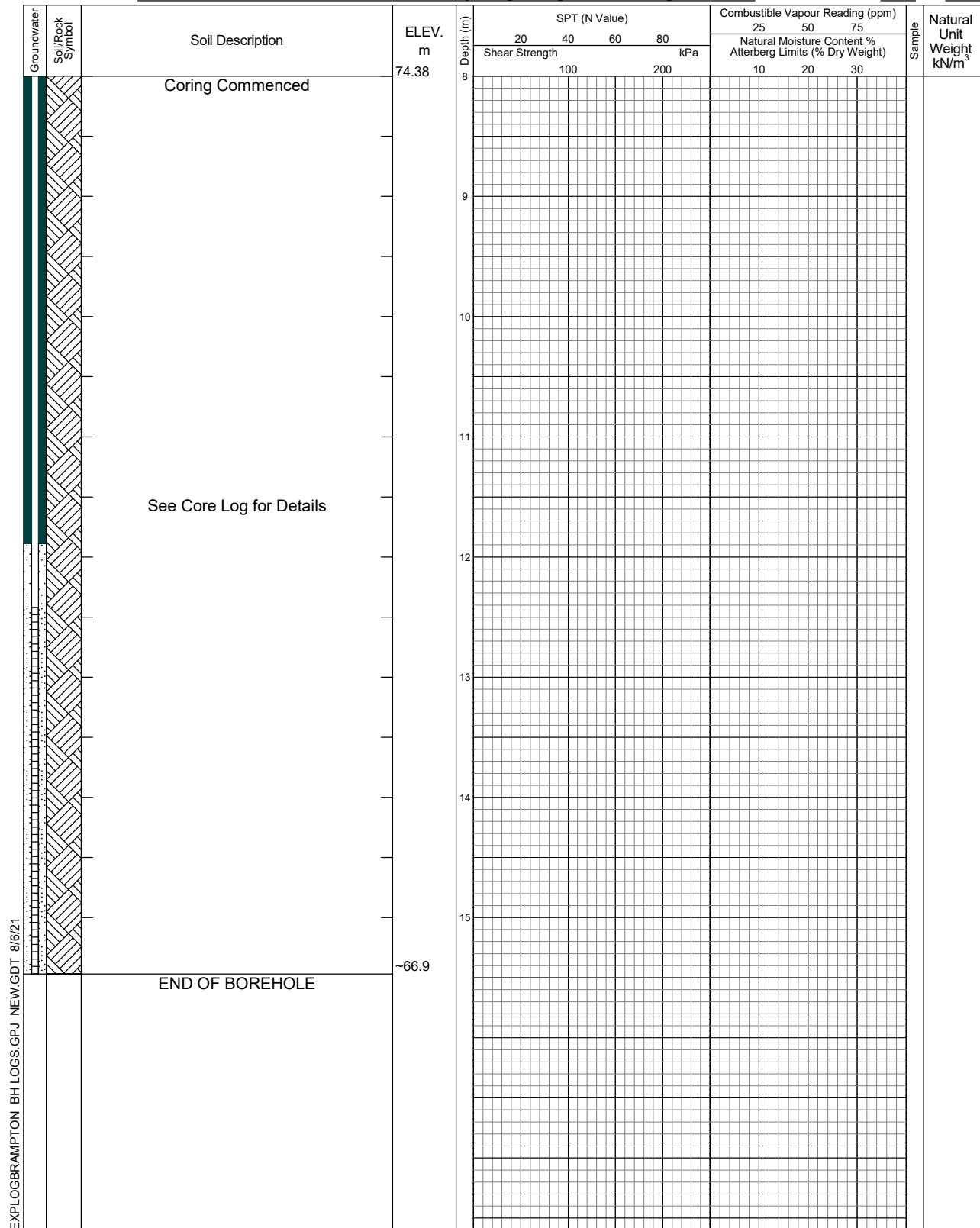
Log of Borehole 5

Project No. BRM-00239423-E0

Drawing No. 6

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 2 of 2



EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.47
July 12, 2021	7.96	
July 14, 2021	11.19	

Log of Borehole 6

Project No. BRM-00239423-E0

Drawing No. 7

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: July 6, 2021

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

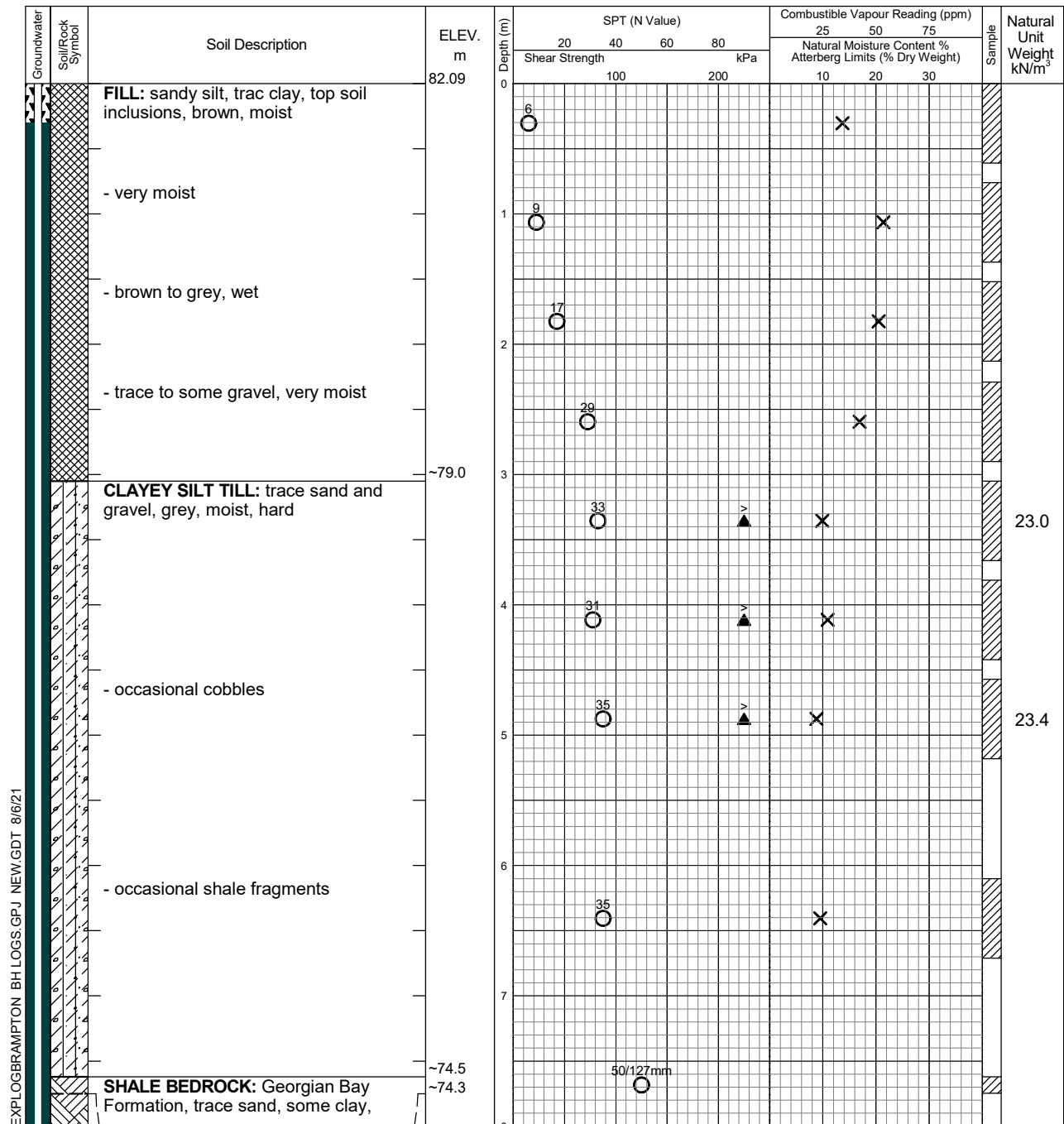
Undrained Triaxial at

% Strain at Failure

Penetrometer

Drill Type: Truck - CME 75

Datum: Geodetic



Continued Next Page



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	14.33
July 12, 2021	8.34	
July 14, 2021	8.44	

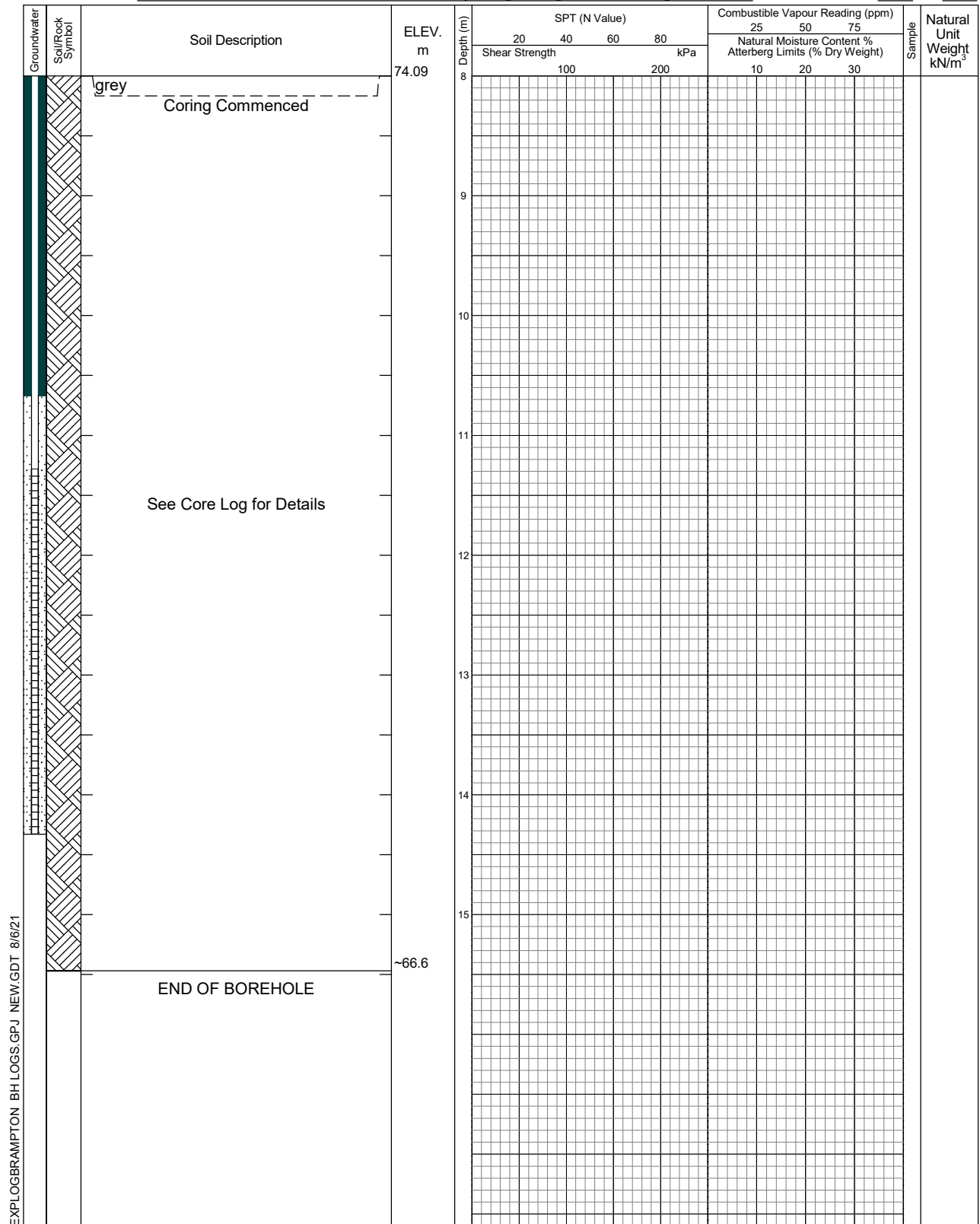
Log of Borehole 6

Project No. BRM-00239423-E0

Drawing No. 7

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 2 of 2



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	14.33
July 12, 2021	8.34	
July 14, 2021	8.44	

Log of Borehole 7

Project No. BRM-00239423-E0

Drawing No. 8

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 2

Location: Ann St and High St E, Mississauga, ON

Date Drilled: July 7, 2021

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

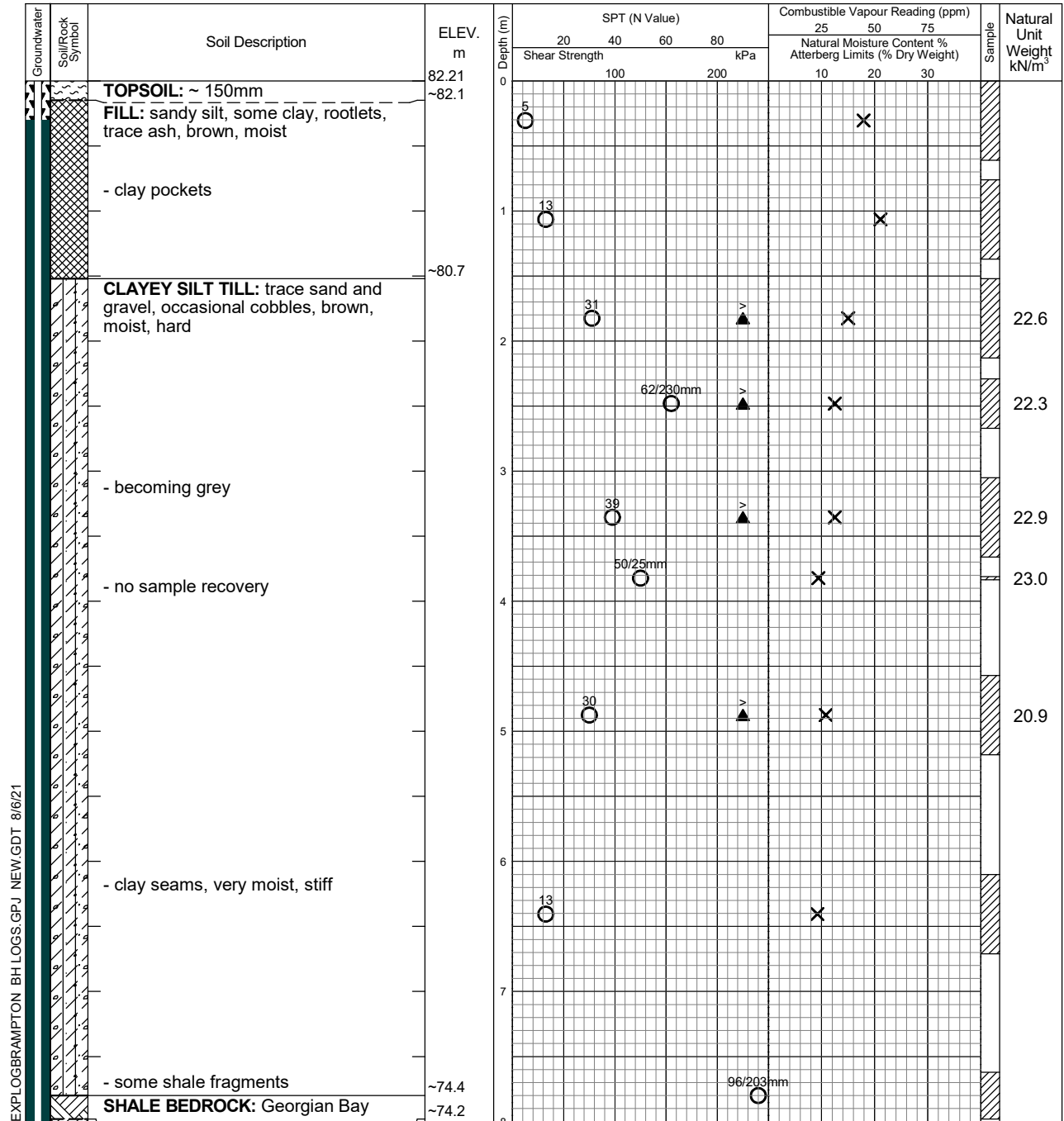
Undrained Triaxial at

% Strain at Failure

Penetrometer

Drill Type: Truck - CME 75

Datum: Geodetic



Continued Next Page

Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.9
July 12, 2021	8.71	
July 14, 2021	10.65	



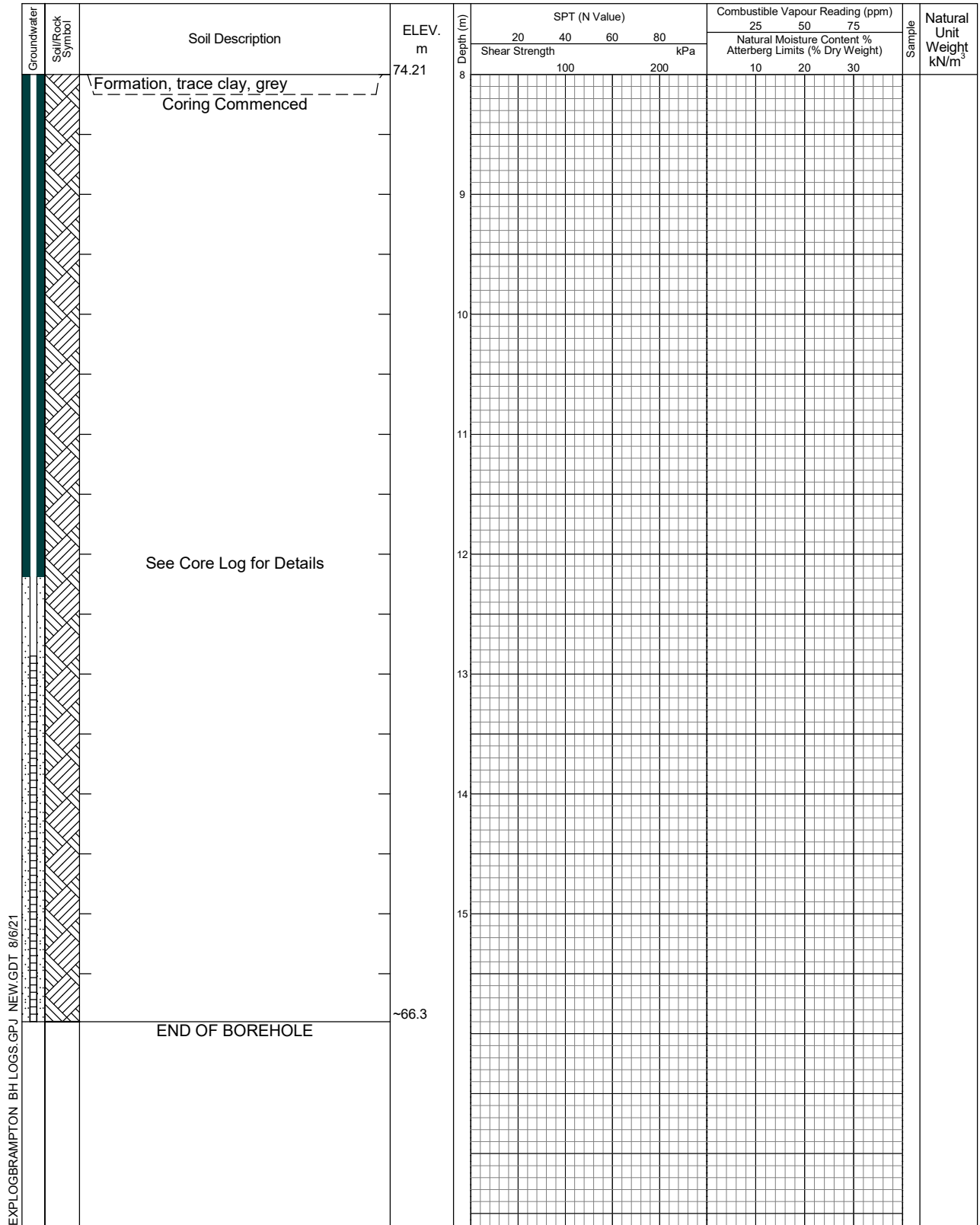
Log of Borehole 7

Project No. BRM-00239423-E0

Drawing No. 8

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 2 of 2



Date	Water Level (m)	Hole Open to (m)
On completion	N/A	15.9
July 12, 2021	8.71	
July 14, 2021	10.65	

Log of Borehole 8

Project No. BRM-00239423-E0

Drawing No. 9

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 1

Location: Ann St and High St E, Mississauga, ON

Date Drilled: June 30, 2021

Auger Sample

SPT (N) Value

Drill Type: CME 55 Track Mount - Hollow Stem Dynamic Cone Test

Shelby Tube

Field Vane Test

Datum: Geodetic

Combustible Vapour Reading

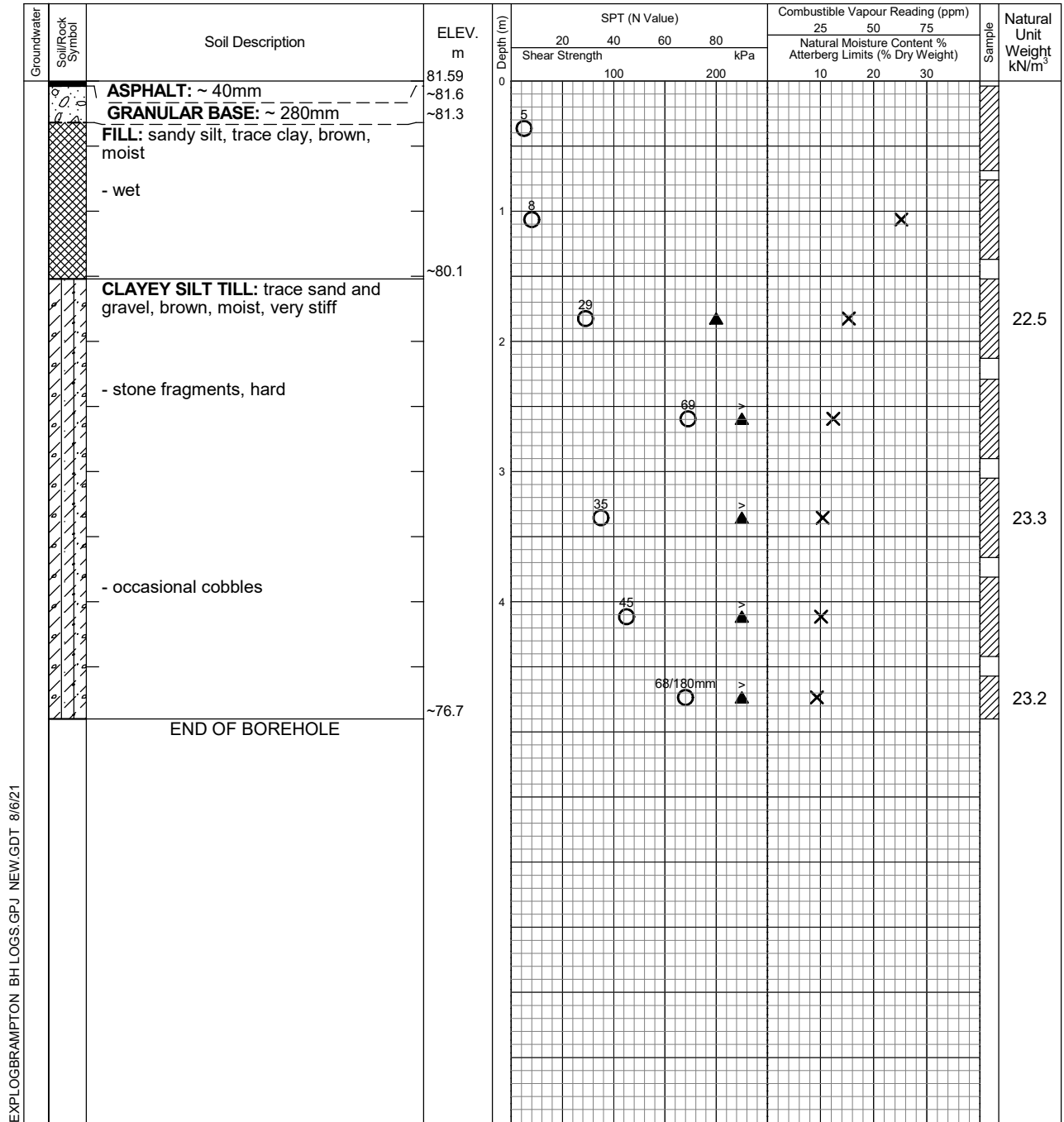
Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at

% Strain at Failure

Penetrometer



EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)
On completion	Dry	4.57

Log of Borehole 9

Project No. BRM-00239423-E0

Drawing No. 10

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 1

Location: Ann St and High St E, Mississauga, ON

Date Drilled: June 30, 2021

Auger Sample

SPT (N) Value

Drill Type: CME 55 Track Mount - Hollow Stem

Dynamic Cone Test

Datum: Geodetic

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at

% Strain at Failure

Penetrometer

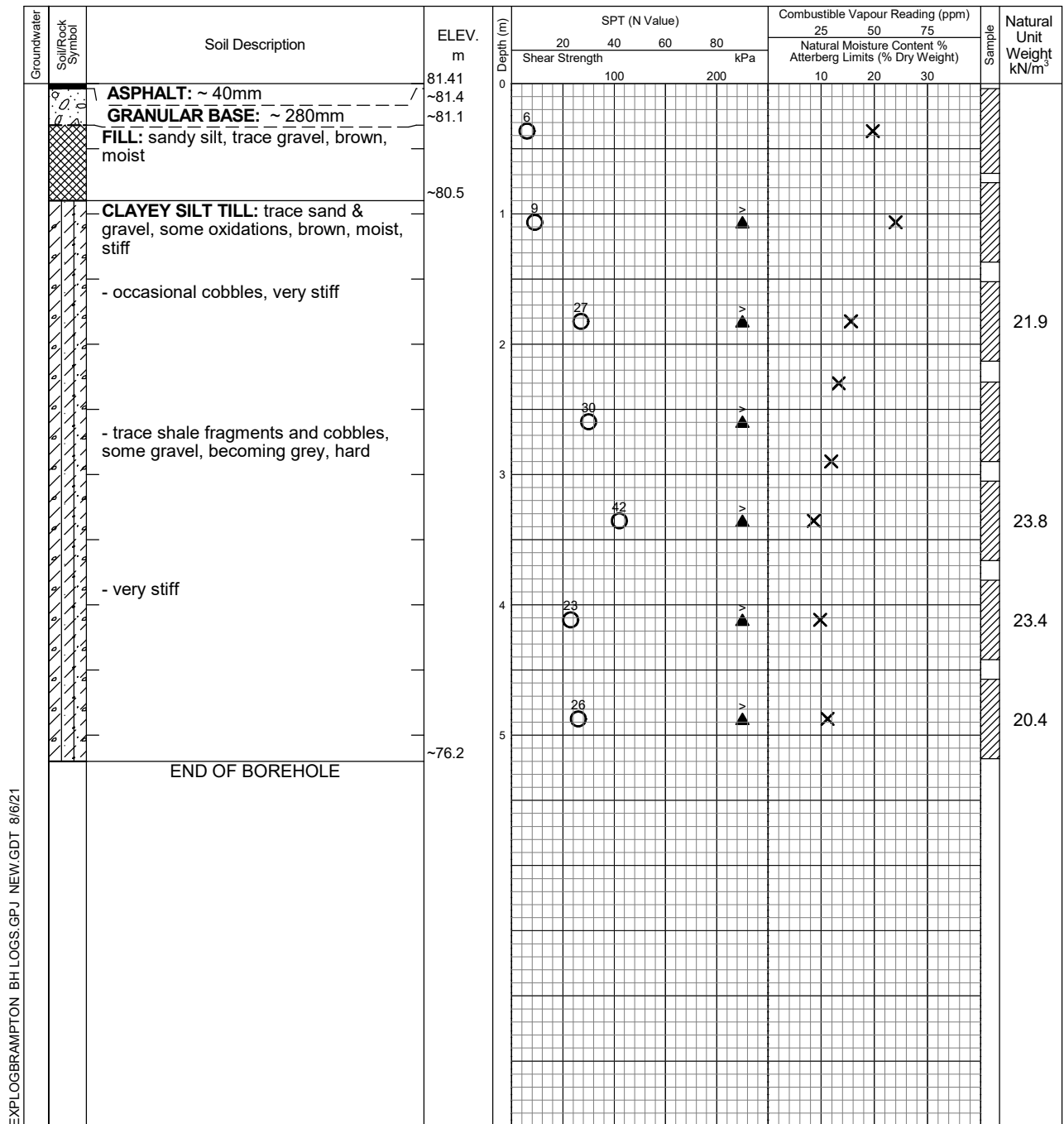
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EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)
On completion	Dry	4.57



Log of Borehole 5S

Project No. BRM-00239423-E0

Drawing No. 6S

Project: Environmental, Geotechnical and Hydrogeological Investigation

Sheet No. 1 of 1

Location: Ann St and High St E, Mississauga, ON

Date Drilled: July 5, 2021

Auger Sample



SPT (N) Value



Dynamic Cone Test



Shelby Tube



Field Vane Test



Combustible Vapour Reading



Natural Moisture



Plastic and Liquid Limit



Undrained Triaxial at



% Strain at Failure



Penetrometer



Datum: Geodetic

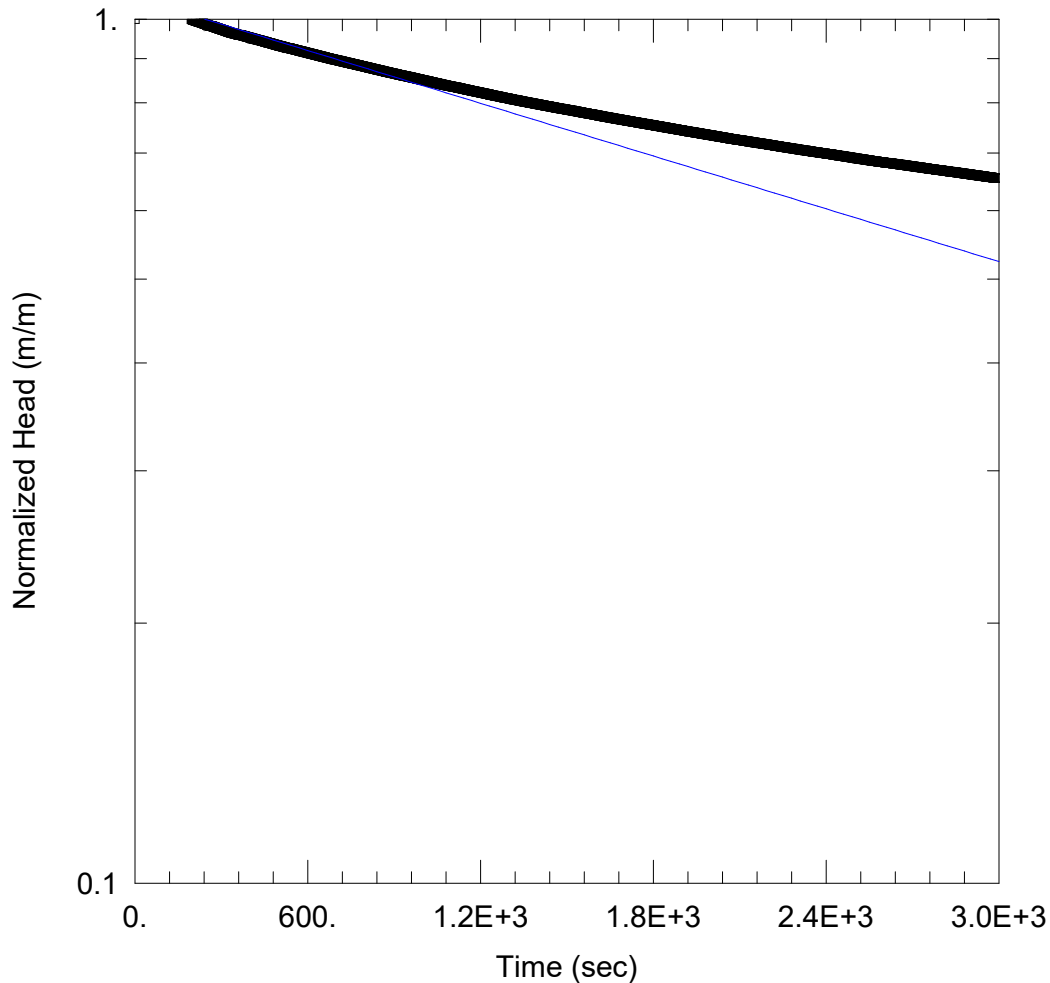
Groundwater Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value)				Combustible Vapour Reading (ppm)			Sample	Natural Unit Weight kN/m ³
				20	40	60	80	25	50	75		
				Shear Strength				Natural Moisture Content % Atterberg Limits (% Dry Weight)				
				kPa								
		80.96	0	100		200		10	20	30		
			1									
			2									
			3									
			4									
			5									
			6									
			7									

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 8/6/21



Date	Water Level (m)	Hole Open to (m)

Appendix C – SWRT Procedures and Results



SWRT BH1 - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \...\BH3d.aqt

Date: 08/04/21

Time: 17:13:46

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH1

Test Date: July 12 2021

AQUIFER DATA

Saturated Thickness: 6.46 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (BH3d)

Initial Displacement: 3.693 m

Static Water Column Height: 6.46 m

Total Well Penetration Depth: 6.46 m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

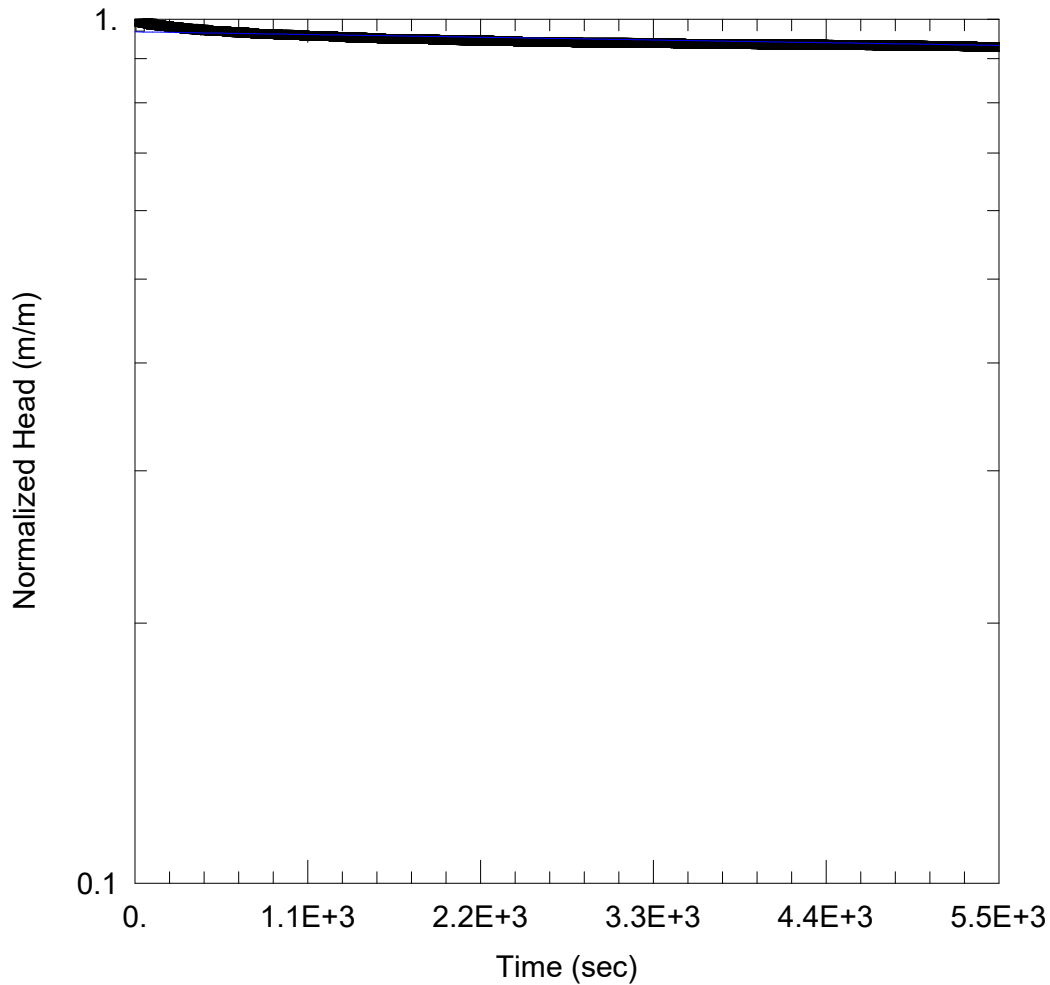
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 1.377E-7$ m/sec

$y_0 = 3.909$ m



SWRT BH2 - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \...\BH2.aqt

Date: 08/04/21

Time: 17:13:24

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH2

Test Date: July 12 2021

AQUIFER DATA

Saturated Thickness: 2.85 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH2)

Initial Displacement: 2.07 m

Static Water Column Height: 2.85 m

Total Well Penetration Depth: 3. m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

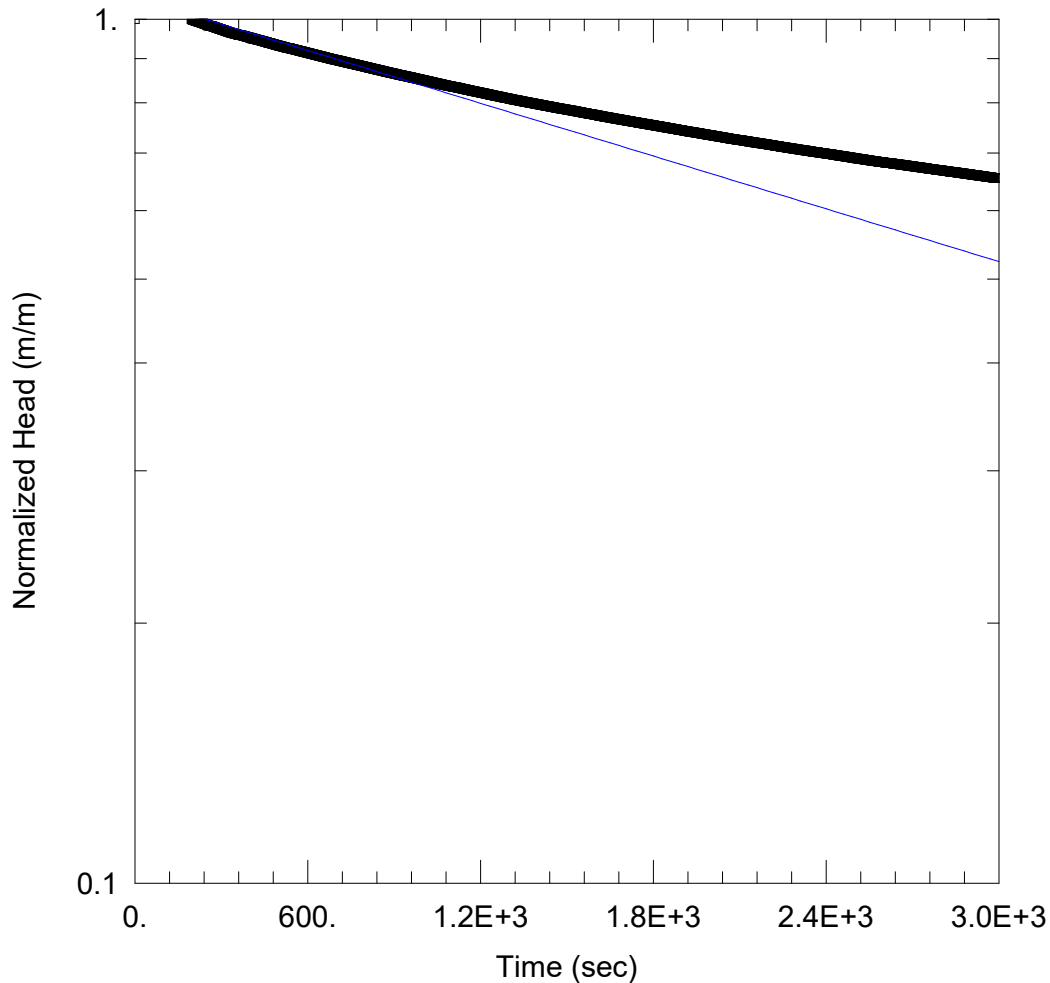
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 3.959E-9 m/sec

y0 = 2.001 m



SWRT BH3D - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \...\BH1.aqt

Date: 08/04/21

Time: 17:08:21

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH3d

Test Date: July 12 2021

AQUIFER DATA

Saturated Thickness: 6.46 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (BH3d)

Initial Displacement: 3.693 m

Static Water Column Height: 6.46 m

Total Well Penetration Depth: 6.46 m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

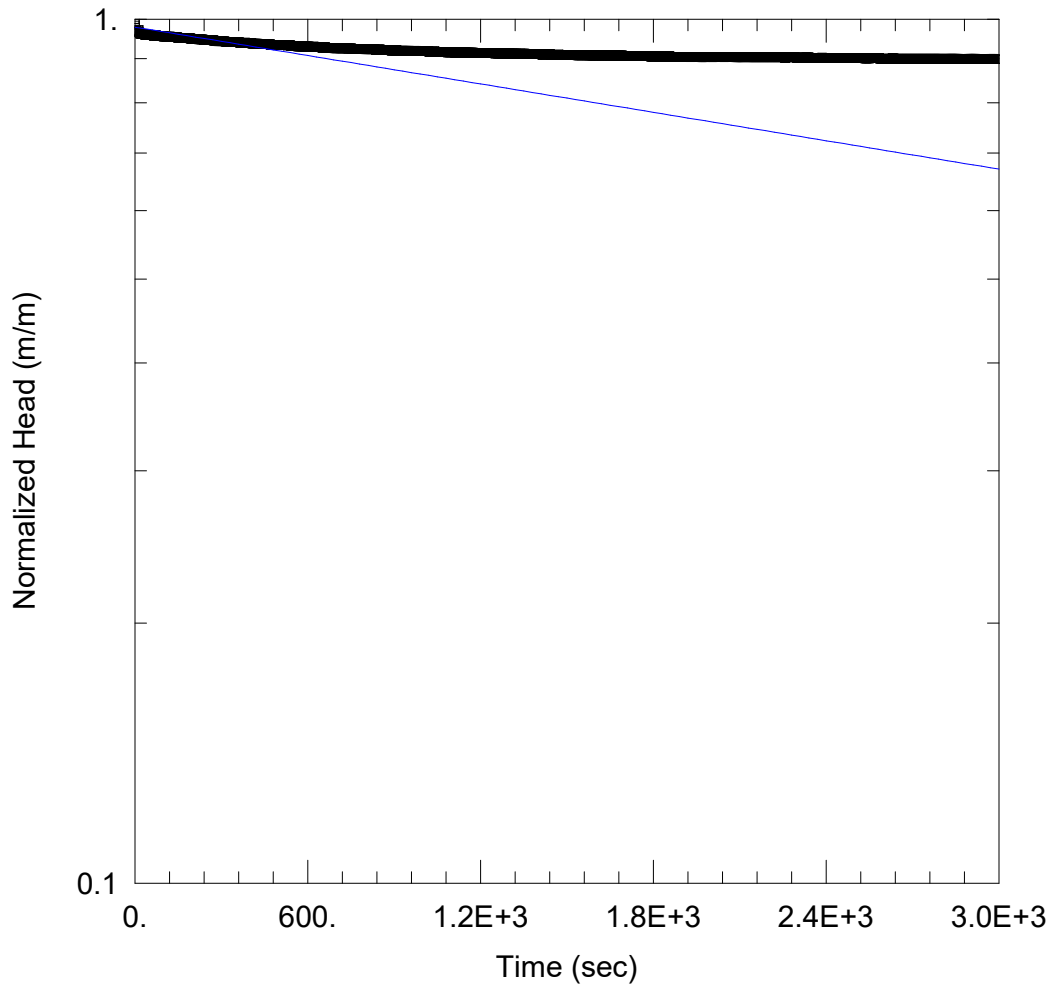
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 1.377E-7$ m/sec

$y_0 = 3.909$ m



SWRT BH3S - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \...\BH3s.aqt

Date: 08/04/21

Time: 17:14:04

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH3s

Test Date: July 14 2021

AQUIFER DATA

Saturated Thickness: 5.66 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH3s)

Initial Displacement: 2.046 m

Static Water Column Height: 5.66 m

Total Well Penetration Depth: 5.66 m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

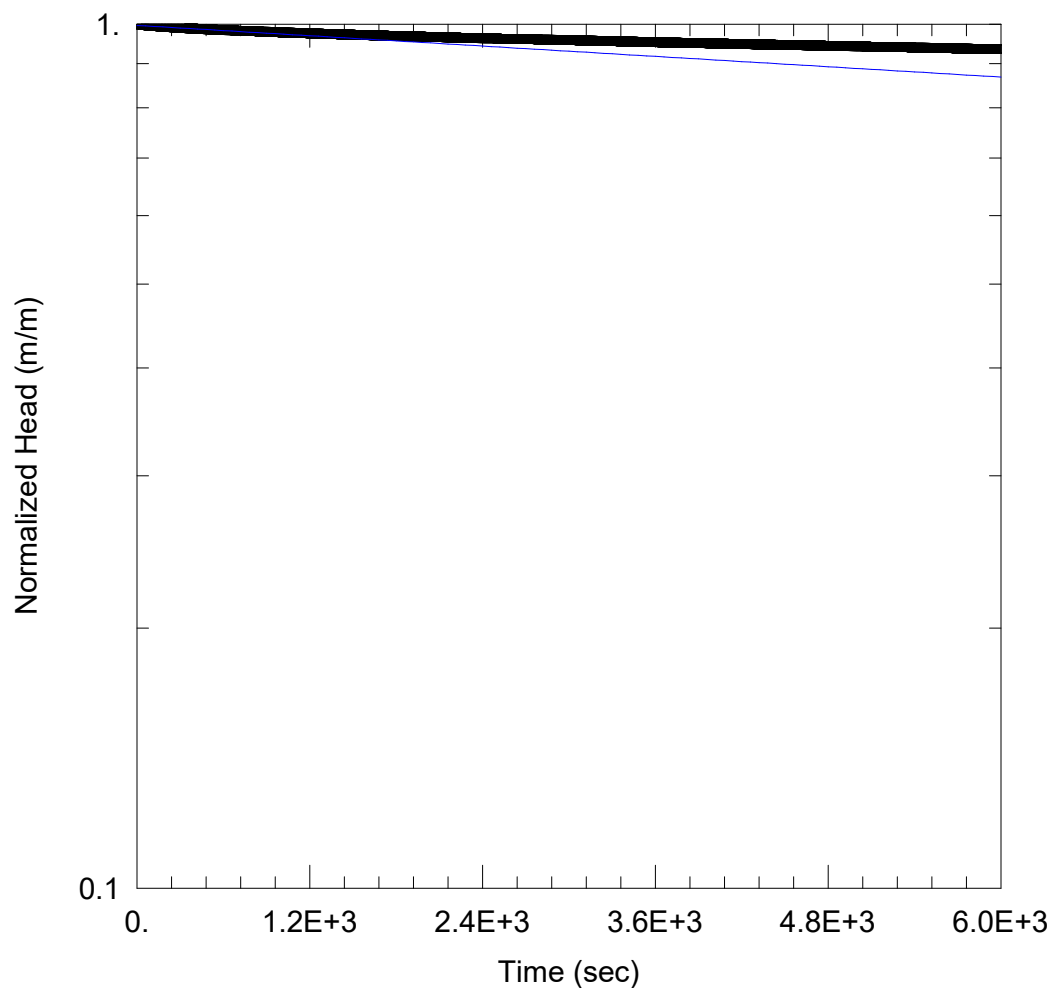
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 7.414E-8 m/sec

y0 = 2.003 m



SWRT BH5D - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \...\BH5d.aqt

Date: 08/04/21

Time: 17:14:30

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH5d

Test Date: July 12 2021

AQUIFER DATA

Saturated Thickness: 7.45 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH5d)

Initial Displacement: 6.97 m

Static Water Column Height: 7.45 m

Total Well Penetration Depth: 7.45 m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

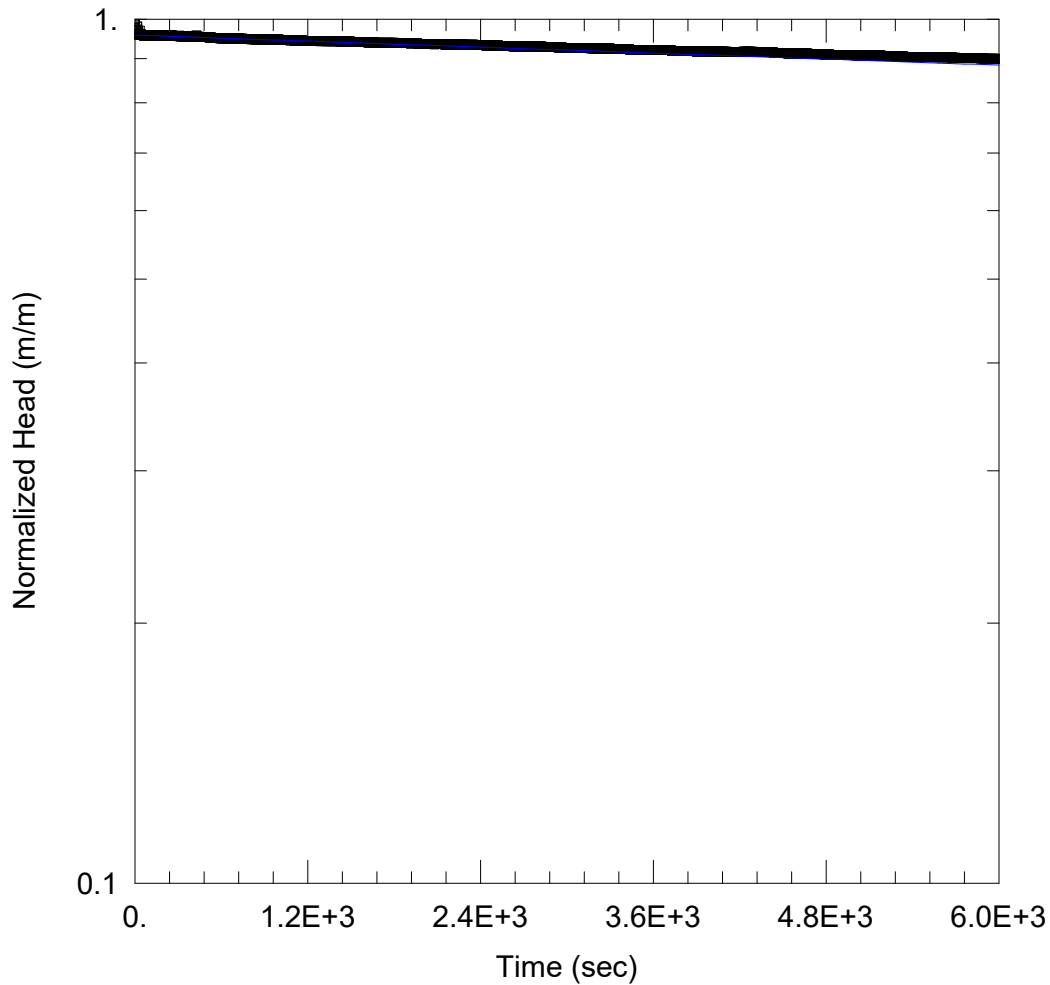
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 1.349E-8 m/sec

y0 = 6.946 m



SWRT BH5S - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \\...\BH5s.aqt

Date: 08/04/21

Time: 17:14:49

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH5s

Test Date: July 14 2021

AQUIFER DATA

Saturated Thickness: 0.21 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH5s)

Initial Displacement: 1.923 m

Static Water Column Height: 0.21 m

Total Well Penetration Depth: 3. m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

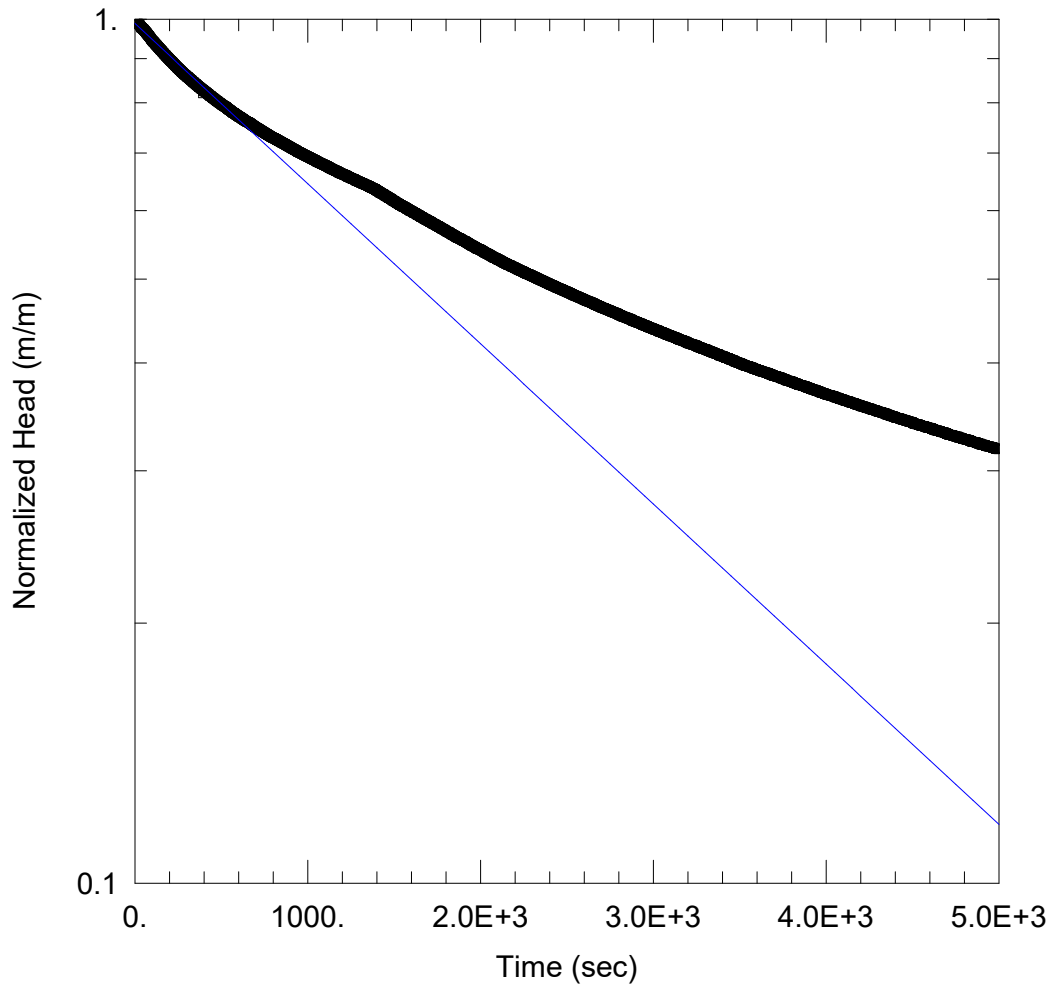
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 1.085E-7 m/sec

y0 = 1.843 m



SWRT BH6 - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \...\BH6.aqt

Date: 08/04/21

Time: 17:15:04

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH6

Test Date: July 12 2021

AQUIFER DATA

Saturated Thickness: 6.28 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (BH6)

Initial Displacement: 4.911 m

Static Water Column Height: 6.28 m

Total Well Penetration Depth: 6.28 m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

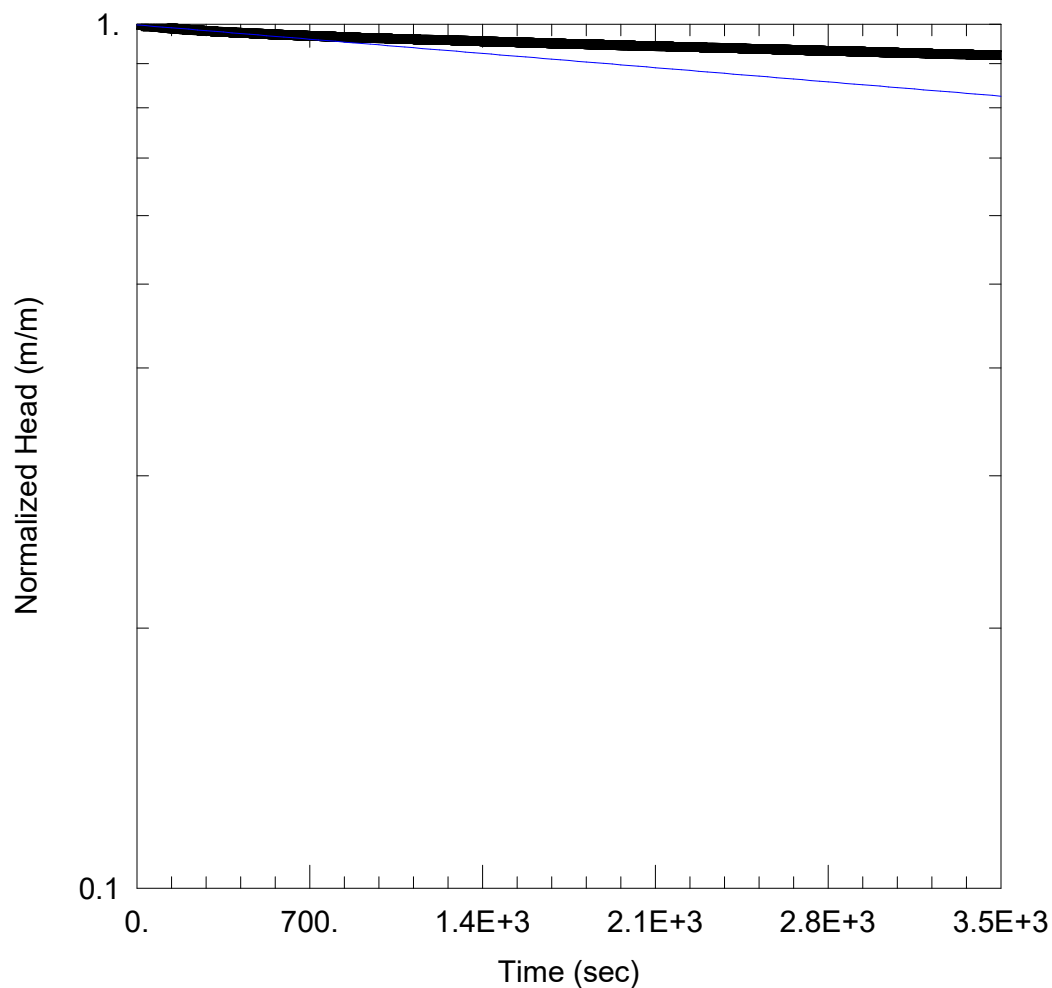
SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 2.19E-7$ m/sec

$y_0 = 4.853$ m



SWRT BH7 - ANN ST. AND HIGH ST., TORONTO ON

Data Set: \\...\BH7.aqt

Date: 08/04/21

Time: 17:15:15

PROJECT INFORMATION

Company: EXP Services Inc

Client: WEST GO GP Inc.

Project: 999-00239423-PP

Location: Ann St & High St, Toronto ON

Test Well: BH7

Test Date: July 12 2021

AQUIFER DATA

Saturated Thickness: 7.1 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH7)

Initial Displacement: 6.795 m

Static Water Column Height: 7.1 m

Total Well Penetration Depth: 7.1 m

Screen Length: 3. m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

K = 3.184E-8 m/sec

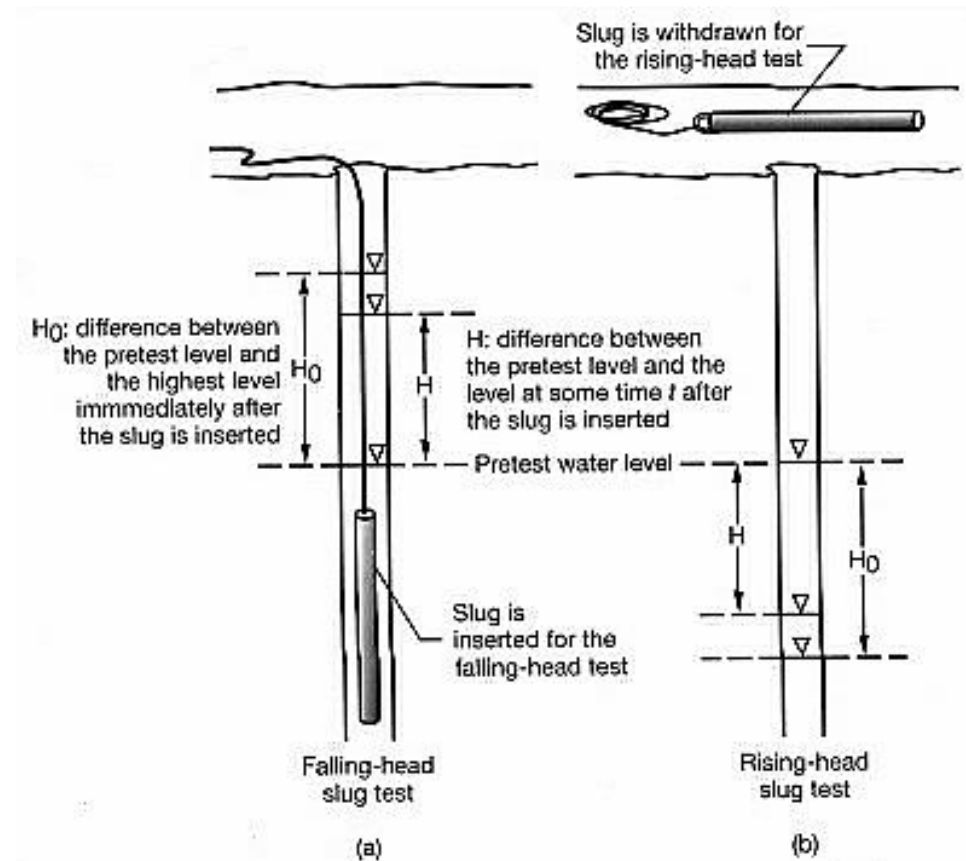
y0 = 6.78 m

Single Well Response Test Procedure

A Single Well Response Test (SWRT), also known as a bail test or a slug test, is conducted in order to determine the saturated hydraulic conductivity (K) of an aquifer. The method of the SWRT is to characterize the change of groundwater level in a well or borehole over time.

In order to ensure consistency and repeatability, all **exp** employees are to follow the procedure outlined in this document when conducting SWRTs.

The figure below depicts a schematic of a slug and bail test and the respective water level changes.





Slug Test Procedure

Equipment Required

- Copy of a signed health and safety plan
- Copy of the work program
- PPE as required by Site-Specific HASP
- Copy of the monitoring well location plan/site plan
- Waterproof pen and bound field note book
- SWRT field data Entry form
- Disposable gloves
- Duct tape
- Deionized water
- Alconox (phosphate free detergent)
- Spray bottles
- Electronic water level meter and spare batteries
- Solid PVC or stainless steel slug of known volume or clean water
- String (nylon)
- Water pressure transducer (data logger) and baro-logger
- Watch or stop watch with second hand
- Plastic sheeting

Testing Procedure

1. Remove cap from well and collect static water level
2. Remove waterra tubing/bailer and place in garbage bag. Record static water level measurement again.
3. Lower the slug into the well and record the dynamic water level.
4. Record the drawdown (for the slug test) at set five (5) second intervals for the first five (5) minutes, then reduce to every one (1) minute.
5. Continue recording the drawdown until 95% recovery is reached. To calculate this value: Find the difference between the dynamic water level and the static water level, then multiply by 95% (.95). Add the resulting value to the dynamic water level.
$$(\text{Static Water Level} - \text{Dynamic Water Level}) \times .95 + \text{Static Water Level} = 95\% \text{ Recovery Value}$$
6. Once complete, replace the waterra tubing/bailer and re-secure the well cap.

Note: If the well is deep, more than one slug may be inserted by attaching the slugs to a series.

Slugs must be washed with methanol, then lab grade soap, and then rinsed with de-ionized water after each use.



Based on the recorded observations, the hydraulic conductivity (in m/s) of the aquifer will be determined. In order to determine the hydraulic conductivity; the well diameter, radius of the borehole and length of the screen will also be required.

Bail Test Procedure

Equipment Required

- 20 L (5 gal) Graduated pail
- Stop watch or watch with seconds
- Garbage bags
- Water level meter
- Field sheets/log book
- Latex Gloves
- Bailer and Rope

Procedure

1. Remove cap from well and collect static water level.
2. If using a **bailer**:
 - a. Affix the rope to the bailer.
 - b. Remove the waterra tubing and place in garbage bag
 - c. Record static water level measurement again.
 - d. Record how much water was removed by either counting the number of full bailers or emptying removed water into a container.
 - e. Quickly lower the bailer into the well and remove.
 - f. Continue this process until the water level will reduce no further.
 - g. Record the dynamic water level.
3. If using **waterra** to bail the water:
 - a. Pump the water into graduated bucket until the water level will reduce no further.
 - b. Record how much water has been removed.
 - c. Record the dynamic water level.
4. Record the recovery at set five (5) second intervals for the first (5) minutes, then reduce to every one (1) minute.
5. Continue recording the drawdown/recovery until 95% recovery is reached.
6. Once complete, replace any waterra tubing that may have been removed from the well and re-secure the well cap.

Appendix D – Laboratory's Certificates of Analysis

**Attention: Francois Chartier**

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Your P.O. #: BRM-ENV
Your Project #: BRM-00239423-E0
Site#: MISSISSUAGA
Site Location: HIGH & ANN ST.
Your C.O.C. #: 822431-11-01

Report Date: 2022/05/25
Report #: R7138624
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT**BUREAU VERITAS JOB #: C1J6109****Received: 2021/07/14, 17:54**

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2021/07/15	2021/07/16	CAM SOP-00301	EPA 8270 m
Carbonaceous BOD	1	2021/07/15	2021/07/20	CAM SOP-00427	SM 23 5210B m
Total Cyanide	1	2021/07/19	2021/07/20	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2021/07/15	2021/07/16	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2021/07/19	2021/07/19	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2021/07/20	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2021/07/14	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2021/07/18	2021/07/20	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2021/07/18	2021/07/20	CAM SOP-00313	BV Labs Method
Animal and Vegetable Oil and Grease	1	N/A	2021/07/22	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2021/07/21	2021/07/22	CAM SOP-00326	EPA1664B m,SM5520B m
Polychlorinated Biphenyl in Water	1	2021/07/20	2021/07/20	CAM SOP-00309	EPA 8082A m
pH	1	2021/07/15	2021/07/16	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2021/07/16	CAM SOP-00444	OMOE E3179 m
Field Measured pH (1)	1	N/A	2021/07/14		Field pH Meter
Sulphate by Automated Colourimetry	1	N/A	2021/07/15	CAM SOP-00464	EPA 375.4 m
Field Temperature (1)	1	N/A	2021/07/14		Field Thermometer
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2021/07/21	2021/07/22	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2021/07/17	2021/07/20	CAM SOP-00428	SM 23 2540D m
Turbidity - On-site	1	N/A	2021/07/15		
Volatile Organic Compounds in Water	1	N/A	2021/07/19	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.



Attention: Francois Chartier

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Your P.O. #: BRM-ENV
Your Project #: BRM-00239423-E0
Site#: MISSISSUAGA
Site Location: HIGH & ANN ST.
Your C.O.C. #: 822431-11-01

Report Date: 2022/05/25
Report #: R7138624
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C1J6109

Received: 2021/07/14, 17:54

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.

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

Encryption Key

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

Patricia Legette, Project Manager

Email: Patricia.Legette@bureauveritas.com

Phone# (905)817-5799

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109
Report Date: 2022/05/25

exp Services Inc
Client Project #: BRM-00239423-E0
Site Location: HIGH & ANN ST.
Your P.O. #: BRM-ENV
Sampler Initials: TM

PEEL SANITARY & STORM SEWER (53-2010)

Bureau Veritas ID			QCF804			QCF804		
Sampling Date			2021/07/14 15:00			2021/07/14 15:00		
COC Number			822431-11-01			822431-11-01		
	UNITS	Criteria	BH/MW1	RDL	QC Batch	BH/MW1 Lab-Dup	RDL	QC Batch

Calculated Parameters

Total Animal/Vegetable Oil and Grease	mg/L	-	ND	0.50	7463445			
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Inorganics

Total Carbonaceous BOD	mg/L	15	ND	2	7464213			
Fluoride (F-)	mg/L	-	0.98	0.10	7465352			
pH	pH	6.9	8.03		7465364			
Phenols-4AAP	mg/L	0.008	ND	0.0010	7466390			
Total Suspended Solids	mg/L	15	24	10	7468901			
Dissolved Sulphate (SO4)	mg/L	-	110	1.0	7465393			
Total Cyanide (CN)	mg/L	0.02	ND	0.0050	7470597			

Petroleum Hydrocarbons

Total Oil & Grease	mg/L	-	ND	0.50	7476043			
Total Oil & Grease Mineral/Synthetic	mg/L	-	ND	0.50	7476060			

Miscellaneous Parameters

Nonylphenol Ethoxylate (Total)	mg/L	-	ND	0.025	7469445	ND	0.025	7469445
Nonylphenol (Total)	mg/L	-	ND	0.001	7469422			

Metals

Mercury (Hg)	mg/L	0.0004	ND	0.00010	7469714			
Total Aluminum (Al)	ug/L	1000	800	4.9	7470705			
Total Antimony (Sb)	ug/L	-	1.8	0.50	7470705			
Total Arsenic (As)	ug/L	20	2.1	1.0	7470705			
Total Cadmium (Cd)	ug/L	8	ND	0.090	7470705			
Total Chromium (Cr)	ug/L	80	ND	5.0	7470705			
Total Cobalt (Co)	ug/L	-	ND	0.50	7470705			
Total Copper (Cu)	ug/L	40	ND	0.90	7470705			
Total Lead (Pb)	ug/L	120	ND	0.50	7470705			
Total Manganese (Mn)	ug/L	2000	93	2.0	7470705			
Total Molybdenum (Mo)	ug/L	-	11	0.50	7470705			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022

ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

PEEL SANITARY & STORM SEWER (53-2010)

Bureau Veritas ID			QCF804			QCF804		
Sampling Date			2021/07/14 15:00			2021/07/14 15:00		
COC Number			822431-11-01			822431-11-01		
	UNITS	Criteria	BH/MW1	RDL	QC Batch	BH/MW1 Lab-Dup	RDL	QC Batch
Total Nickel (Ni)	ug/L	80	1.3	1.0	7470705			
Total Phosphorus (P)	ug/L	400	ND	100	7470705			
Total Selenium (Se)	ug/L	20	ND	2.0	7470705			
Total Silver (Ag)	ug/L	120	ND	0.090	7470705			
Total Tin (Sn)	ug/L	-	1.4	1.0	7470705			
Total Titanium (Ti)	ug/L	-	21	5.0	7470705			
Total Zinc (Zn)	ug/L	200	ND	5.0	7470705			
Semivolatile Organics								
Bis(2-ethylhexyl)phthalate	ug/L	-	ND	2.0	7463964			
Di-N-butyl phthalate	ug/L	-	ND	2.0	7463964			
Volatile Organics								
Benzene	ug/L	2	ND	0.40	7465225			
Chloroform	ug/L	-	2.6	0.40	7465225			
1,2-Dichlorobenzene	ug/L	5.6	ND	0.80	7465225			
1,4-Dichlorobenzene	ug/L	6.8	ND	0.80	7465225			
cis-1,2-Dichloroethylene	ug/L	-	ND	1.0	7465225			
trans-1,3-Dichloropropene	ug/L	-	ND	0.80	7465225			
Ethylbenzene	ug/L	2	ND	0.40	7465225			
Methylene Chloride(Dichloromethane)	ug/L	5.2	ND	4.0	7465225			
Methyl Ethyl Ketone (2-Butanone)	ug/L	-	ND	20	7465225			
Styrene	ug/L	-	ND	0.80	7465225			
1,1,2,2-Tetrachloroethane	ug/L	17	ND	0.80	7465225			
Tetrachloroethylene	ug/L	4.4	ND	0.40	7465225			
Toluene	ug/L	2	ND	0.40	7465225			
Trichloroethylene	ug/L	7.6	ND	0.40	7465225			
p+m-Xylene	ug/L	-	ND	0.40	7465225			
o-Xylene	ug/L	-	ND	0.40	7465225			
Total Xylenes	ug/L	4.4	ND	0.40	7465225			
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Lab-Dup = Laboratory Initiated Duplicate								
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022								
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.								



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109
Report Date: 2022/05/25

exp Services Inc
Client Project #: BRM-00239423-E0
Site Location: HIGH & ANN ST.
Your P.O. #: BRM-ENV
Sampler Initials: TM

PEEL SANITARY & STORM SEWER (53-2010)

Bureau Veritas ID			QCF804			QCF804		
Sampling Date			2021/07/14 15:00			2021/07/14 15:00		
COC Number			822431-11-01			822431-11-01		
	UNITS	Criteria	BH/MW1	RDL	QC Batch	BH/MW1 Lab-Dup	RDL	QC Batch
PCBs								
Total PCB	ug/L	0.4	ND	0.05	7470615			
Microbiological								
Escherichia coli	CFU/100mL	200	200	10	7463641			
Surrogate Recovery (%)								
2,4,6-Tribromophenol	%	-	69		7463964			
2-Fluorobiphenyl	%	-	48		7463964			
2-Fluorophenol	%	-	27		7463964			
D14-Terphenyl	%	-	85		7463964			
D5-Nitrobenzene	%	-	48		7463964			
D5-Phenol	%	-	22		7463964			
Decachlorobiphenyl	%	-	99		7470615			
4-Bromofluorobenzene	%	-	87		7465225			
D4-1,2-Dichloroethane	%	-	111		7465225			
D8-Toluene	%	-	92		7465225			
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Lab-Dup = Laboratory Initiated Duplicate								
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022								
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.								



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109
Report Date: 2022/05/25

exp Services Inc
Client Project #: BRM-00239423-E0
Site Location: HIGH & ANN ST.
Your P.O. #: BRM-ENV
Sampler Initials: TM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID			QCF804	
Sampling Date			2021/07/14 15:00	
COC Number			822431-11-01	
	UNITS	Criteria	BH/MW1	QC Batch
Field Measurements				
Field Temperature	Celsius	-	21.2	ONSITE
Field Turbidity	NTU	-	12.1	ONSITE
Field Measured pH	pH	6:9	7.84	ONSITE
No Fill	No Exceedance			
Grey	Exceeds 1 criteria policy/level			
Black	Exceeds both criteria/levels			
QC Batch = Quality Control Batch				
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022				



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

TEST SUMMARY

Bureau Veritas ID: QCF804
Sample ID: BH/MW1
Matrix: Water

Collected: 2021/07/14
Shipped:
Received: 2021/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
ABN Compounds in Water by GC/MS	GC/MS	7463964	2021/07/15	2021/07/16	Milijana Avramovic
Carbonaceous BOD	DO	7464213	2021/07/15	2021/07/20	Surleen Kaur Romana
Total Cyanide	SKAL/CN	7470597	2021/07/19	2021/07/20	Aditiben Patel
Fluoride	ISE	7465352	2021/07/15	2021/07/16	Surinder Rai
Mercury in Water by CVAA	CV/AA	7469714	2021/07/19	2021/07/19	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	7470705	N/A	2021/07/20	Arefa Dabhad
E.coli, (CFU/100mL)	PL	7463641	N/A	2021/07/14	Ranju Chaudhari
Total Nonylphenol in Liquids by HPLC	LC/FLU	7469422	2021/07/18	2021/07/20	Dennis Boodram
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	7469445	2021/07/18	2021/07/20	Dennis Boodram
Animal and Vegetable Oil and Grease	BAL	7463445	N/A	2021/07/22	Automated Statchk
Total Oil and Grease	BAL	7476043	2021/07/21	2021/07/22	Saumya Modh
Polychlorinated Biphenyl in Water	GC/ECD	7470615	2021/07/20	2021/07/20	Farag Mansour
pH	AT	7465364	2021/07/15	2021/07/16	Surinder Rai
Phenols (4AAP)	TECH/PHEN	7466390	N/A	2021/07/16	Deonarine Ramnarine
Field Measured pH	PH	ONSITE	N/A	2021/07/14	Michelle Huth
Sulphate by Automated Colourimetry	KONE	7465393	N/A	2021/07/15	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/07/14	Michelle Huth
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	7476060	2021/07/21	2021/07/22	Saumya Modh
Total Suspended Solids	BAL	7468901	2021/07/17	2021/07/20	Sandeep Kaur
Field Measured pH	TURB	ONSITE	N/A	2021/07/15	Michelle Huth
Volatile Organic Compounds in Water	GC/MS	7465225	N/A	2021/07/19	Karen Hughes

Bureau Veritas ID: QCF804 Dup
Sample ID: BH/MW1
Matrix: Water

Collected: 2021/07/14
Shipped:
Received: 2021/07/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	7469445	2021/07/18	2021/07/20	Dennis Boodram



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

GENERAL COMMENTS

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

Package 1	24.0°C
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Revised Report (2022/05/25): Mississauga Storm criteria policy has been added to this CofA as per Jeffrey Leon's request.

Sample QCF804 [BH/MW1] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

QUALITY ASSURANCE REPORT

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

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
7463964	2,4,6-Tribromophenol	2021/07/15	90	10 - 130	83	10 - 130	75	%				
7463964	2-Fluorobiphenyl	2021/07/15	69	30 - 130	66	30 - 130	71	%				
7463964	2-Fluorophenol	2021/07/15	50	10 - 130	51	10 - 130	47	%				
7463964	D14-Terphenyl	2021/07/15	95	30 - 130	92	30 - 130	91	%				
7463964	D5-Nitrobenzene	2021/07/15	88	30 - 130	91	30 - 130	89	%				
7463964	D5-Phenol	2021/07/15	38	10 - 130	35	10 - 130	31	%				
7465225	4-Bromofluorobenzene	2021/07/19	98	70 - 130	99	70 - 130	92	%				
7465225	D4-1,2-Dichloroethane	2021/07/19	109	70 - 130	105	70 - 130	111	%				
7465225	D8-Toluene	2021/07/19	108	70 - 130	108	70 - 130	93	%				
7470615	Decachlorobiphenyl	2021/07/20	101	60 - 130	89	60 - 130	83	%				
7463964	Bis(2-ethylhexyl)phthalate	2021/07/15	100	30 - 130	105	30 - 130	ND, RDL=2.0	ug/L				
7463964	Di-N-butyl phthalate	2021/07/15	99	30 - 130	100	30 - 130	ND, RDL=2.0	ug/L	NC	40		
7464213	Total Carbonaceous BOD	2021/07/20					ND,RDL=2	mg/L	2.1	30	98	85 - 115
7465225	1,1,2,2-Tetrachloroethane	2021/07/19	100	70 - 130	96	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7465225	1,2-Dichlorobenzene	2021/07/19	94	70 - 130	94	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7465225	1,4-Dichlorobenzene	2021/07/19	105	70 - 130	107	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7465225	Benzene	2021/07/19	93	70 - 130	92	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	Chloroform	2021/07/19	99	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	cis-1,2-Dichloroethylene	2021/07/19	98	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC	30		
7465225	Ethylbenzene	2021/07/19	89	70 - 130	90	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	Methyl Ethyl Ketone (2-Butanone)	2021/07/19	121	60 - 140	114	60 - 140	ND, RDL=10	ug/L	NC	30		
7465225	Methylene Chloride(Dichloromethane)	2021/07/19	114	70 - 130	111	70 - 130	ND, RDL=2.0	ug/L	NC	30		
7465225	o-Xylene	2021/07/19	88	70 - 130	94	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	p+m-Xylene	2021/07/19	95	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	Styrene	2021/07/19	101	70 - 130	107	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7465225	Tetrachloroethylene	2021/07/19	86	70 - 130	86	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	Toluene	2021/07/19	97	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7465225	Total Xylenes	2021/07/19					ND, RDL=0.20	ug/L	NC	30		
7465225	trans-1,3-Dichloropropene	2021/07/19	100	70 - 130	96	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7465225	Trichloroethylene	2021/07/19	96	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC	30		

BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

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
7465352	Fluoride (F-)	2021/07/16	112	80 - 120	108	80 - 120	ND, RDL=0.10	mg/L	0.97	20		
7465364	pH	2021/07/16			102	98 - 103			0.69	N/A		
7465393	Dissolved Sulphate (SO4)	2021/07/15	NC	75 - 125	102	80 - 120	ND, RDL=1.0	mg/L	0.43	20		
7466390	Phenols-4AAP	2021/07/16	102	80 - 120	102	80 - 120	ND, RDL=0.0010	mg/L	NC	20		
7468901	Total Suspended Solids	2021/07/20					ND, RDL=10	mg/L	1.6	25	96	85 - 115
7469422	Nonylphenol (Total)	2021/07/20	58	50 - 130	70	50 - 130	ND, RDL=0.001	mg/L	NC	40		
7469445	Nonylphenol Ethoxylate (Total)	2021/07/20	62	50 - 130	77	50 - 130	ND, RDL=0.025	mg/L	NC	40		
7469714	Mercury (Hg)	2021/07/19	101	75 - 125	98	80 - 120	ND, RDL=0.00010	mg/L	NC	20		
7470597	Total Cyanide (CN)	2021/07/20	90	80 - 120	93	80 - 120	ND, RDL=0.0050	mg/L	NC	20		
7470615	Total PCB	2021/07/20	96	60 - 130	76	60 - 130	ND, RDL=0.05	ug/L	NC	40		
7470705	Total Aluminum (Al)	2021/07/20	104	80 - 120	98	80 - 120	ND, RDL=4.9	ug/L	8.4	20		
7470705	Total Antimony (Sb)	2021/07/20	98	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	NC	20		
7470705	Total Arsenic (As)	2021/07/20	102	80 - 120	96	80 - 120	ND, RDL=1.0	ug/L	NC	20		
7470705	Total Cadmium (Cd)	2021/07/20	99	80 - 120	95	80 - 120	ND, RDL=0.090	ug/L	NC	20		
7470705	Total Chromium (Cr)	2021/07/20	97	80 - 120	93	80 - 120	ND, RDL=5.0	ug/L	NC	20		
7470705	Total Cobalt (Co)	2021/07/20	98	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC	20		
7470705	Total Copper (Cu)	2021/07/20	99	80 - 120	95	80 - 120	ND, RDL=0.90	ug/L	7.5	20		
7470705	Total Lead (Pb)	2021/07/20	95	80 - 120	92	80 - 120	ND, RDL=0.50	ug/L	0.44	20		
7470705	Total Manganese (Mn)	2021/07/20	98	80 - 120	95	80 - 120	ND, RDL=2.0	ug/L	6.1	20		
7470705	Total Molybdenum (Mo)	2021/07/20	97	80 - 120	92	80 - 120	ND, RDL=0.50	ug/L	7.0	20		
7470705	Total Nickel (Ni)	2021/07/20	99	80 - 120	95	80 - 120	ND, RDL=1.0	ug/L	NC	20		
7470705	Total Phosphorus (P)	2021/07/20	98	80 - 120	89	80 - 120	ND, RDL=100	ug/L				
7470705	Total Selenium (Se)	2021/07/20	103	80 - 120	102	80 - 120	ND, RDL=2.0	ug/L	NC	20		
7470705	Total Silver (Ag)	2021/07/20	95	80 - 120	92	80 - 120	ND, RDL=0.090	ug/L	NC	20		

BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

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
7470705	Total Tin (Sn)	2021/07/20	96	80 - 120	94	80 - 120	ND, RDL=1.0	ug/L				
7470705	Total Titanium (Ti)	2021/07/20	95	80 - 120	92	80 - 120	ND, RDL=5.0	ug/L	NC	20		
7470705	Total Zinc (Zn)	2021/07/20	101	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		
7476043	Total Oil & Grease	2021/07/22			98	85 - 115	ND, RDL=0.50	mg/L	0.77	25		
7476060	Total Oil & Grease Mineral/Synthetic	2021/07/22			92	85 - 115	ND, RDL=0.50	mg/L	2.2	25		

N/A = Not Applicable

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

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

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

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

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

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

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

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



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

VALIDATION SIGNATURE PAGE

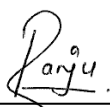
The analytical data and all QC contained in this report were reviewed and validated by:



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



Michelle Huth, Project Manager Assistant



Ranju Chaudhari, QA Coordinator - Food Microbiology

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Page 13 of 14



BUREAU
VERITAS

Bureau Veritas Job #: C1J6109

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: HIGH & ANN ST.

Your P.O. #: BRM-ENV

Sampler Initials: TM

Exceedance Summary Table – Mississauga Storm Sewer
Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
BH/MW1	QCF804-06	Total Suspended Solids	15	24	10	mg/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.



Your Project #: BRM-00239423-F0
Site Location: ANN & HIGH 88, ON
Your C.O.C. #: 852819-01-01

Attention: Jay Samarakkody

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Report Date: 2022/05/25
Report #: R7138650
Version: 4 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C1V8767

Received: 2021/10/29, 09:24

Sample Matrix: Water
Samples Received: 3

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
Dissolved Metals by ICPMS	3	N/A	2021/11/05	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2021/11/05	CAM SOP-00447	EPA 6020B m
Total Suspended Solids	3	2021/11/02	2021/11/03	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	3	N/A	2021/11/03	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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



Your Project #: BRM-00239423-F0
Site Location: ANN & HIGH 88, ON
Your C.O.C. #: 852819-01-01

Attention: Jay Samarakkody

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Report Date: 2022/05/25
Report #: R7138650
Version: 4 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C1V8767

Received: 2021/10/29, 09:24

Encryption Key

Patricia Legette
Project Manager
25 May 2022 16:42:04

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

Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



RESULTS OF ANALYSES OF WATER

Bureau Veritas ID			RCC224	RCC225	RCC226		
Sampling Date			2021/10/29 12:30	2021/10/29 14:30	2021/10/29 16:40		
COC Number			852819-01-01	852819-01-01	852819-01-01		
	UNITS	Criteria	BH3D	BH7	BH6	RDL	QC Batch
Inorganics							
Total Suspended Solids	mg/L	15	52	79	69	10	7675022
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022							

BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID			RCC224		RCC225		RCC226		
Sampling Date			2021/10/29 12:30		2021/10/29 14:30		2021/10/29 16:40		
COC Number			852819-01-01		852819-01-01		852819-01-01		
	UNITS	Criteria	BH3D	RDL	BH7	RDL	BH6	RDL	QC Batch
Metals									
Dissolved Aluminum (Al)	ug/L	-	17	4.9	34	4.9	480	4.9	7676179
Total Aluminum (Al)	ug/L	1000	1500	25	3000	4.9	3100	4.9	7677405
Dissolved Antimony (Sb)	ug/L	-	<0.50	0.50	0.75	0.50	<0.50	0.50	7676179
Total Antimony (Sb)	ug/L	-	<2.5	2.5	0.89	0.50	<0.50	0.50	7677405
Dissolved Arsenic (As)	ug/L	-	<1.0	1.0	9.8	1.0	<1.0	1.0	7676179
Total Arsenic (As)	ug/L	20	<5.0	5.0	12	1.0	<1.0	1.0	7677405
Dissolved Barium (Ba)	ug/L	-	44	2.0	38	2.0	62	2.0	7676179
Total Barium (Ba)	ug/L	-	47	10	50	2.0	62	2.0	7677405
Dissolved Beryllium (Be)	ug/L	-	<0.40	0.40	<0.40	0.40	<0.40	0.40	7676179
Total Beryllium (Be)	ug/L	-	<2.0	2.0	<0.40	0.40	<0.40	0.40	7677405
Dissolved Bismuth (Bi)	ug/L	-	<1.0	1.0	<1.0	1.0	<1.0	1.0	7676179
Total Bismuth (Bi)	ug/L	-	<5.0	5.0	<1.0	1.0	<1.0	1.0	7677405
Dissolved Boron (B)	ug/L	-	2000	10	2200	10	2500	10	7676179
Total Boron (B)	ug/L	-	2000	50	2500	10	2800	10	7677405
Dissolved Cadmium (Cd)	ug/L	-	<0.090	0.090	<0.090	0.090	<0.090	0.090	7676179
Total Cadmium (Cd)	ug/L	8	<0.45	0.45	<0.090	0.090	<0.090	0.090	7677405
Dissolved Calcium (Ca)	ug/L	-	440000	1000	120000	400	150000	400	7676179
Total Calcium (Ca)	ug/L	-	420000	1000	130000	400	140000	1000	7677405
Dissolved Chromium (Cr)	ug/L	-	<5.0	5.0	<5.0	5.0	<5.0	5.0	7676179
Total Chromium (Cr)	ug/L	80	<25	25	8.8	5.0	<5.0	5.0	7677405
Dissolved Cobalt (Co)	ug/L	-	0.82	0.50	<0.50	0.50	0.63	0.50	7676179
Total Cobalt (Co)	ug/L	-	<2.5	2.5	1.8	0.50	2.1	0.50	7677405
Dissolved Copper (Cu)	ug/L	-	0.95	0.90	<0.90	0.90	<0.90	0.90	7676179
Total Copper (Cu)	ug/L	40	<4.5	4.5	3.8	0.90	2.6	0.90	7677405
Dissolved Iron (Fe)	ug/L	-	<100	100	<100	100	960	100	7676179
Total Iron (Fe)	ug/L	-	2400	500	4400	100	4600	100	7677405
Dissolved Lead (Pb)	ug/L	-	<0.50	0.50	<0.50	0.50	<0.50	0.50	7676179
Total Lead (Pb)	ug/L	120	<2.5	2.5	0.94	0.50	<0.50	0.50	7677405
Dissolved Lithium (Li)	ug/L	-	1500	25	490	5.0	530	25	7676179
Total Lithium (Li)	ug/L	-	1600	25	520	25	530	25	7677405
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									



BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID			RCC224		RCC225		RCC226		
Sampling Date			2021/10/29 12:30		2021/10/29 14:30		2021/10/29 16:40		
COC Number			852819-01-01		852819-01-01		852819-01-01		
	UNITS	Criteria	BH3D	RDL	BH7	RDL	BH6	RDL	QC Batch
Dissolved Magnesium (Mg)	ug/L	-	120000	50	31000	50	43000	50	7676179
Total Magnesium (Mg)	ug/L	-	110000	250	33000	50	40000	50	7677405
Dissolved Manganese (Mn)	ug/L	-	420	2.0	99	2.0	170	2.0	7676179
Total Manganese (Mn)	ug/L	2000	460	10	190	2.0	200	2.0	7677405
Dissolved Molybdenum (Mo)	ug/L	-	1.8	0.50	11	0.50	0.76	0.50	7676179
Total Molybdenum (Mo)	ug/L	-	<2.5	2.5	12	0.50	0.90	0.50	7677405
Dissolved Nickel (Ni)	ug/L	-	1.6	1.0	3.1	1.0	2.1	1.0	7676179
Total Nickel (Ni)	ug/L	80	<5.0	5.0	8.0	1.0	5.5	1.0	7677405
Dissolved Phosphorus (P)	ug/L	-	<100	100	<100	100	<100	100	7676179
Dissolved Potassium (K)	ug/L	-	61000	200	25000	200	33000	200	7676179
Total Potassium (K)	ug/L	-	56000	1000	27000	200	34000	200	7677405
Dissolved Selenium (Se)	ug/L	-	<2.0	2.0	<2.0	2.0	<2.0	2.0	7676179
Total Selenium (Se)	ug/L	20	<10	10	<2.0	2.0	<2.0	2.0	7677405
Dissolved Silicon (Si)	ug/L	-	3200	50	4100	50	4300	50	7676179
Total Silicon (Si)	ug/L	-	5100	250	9000	50	8200	50	7677405
Dissolved Silver (Ag)	ug/L	-	<0.090	0.090	<0.090	0.090	<0.090	0.090	7676179
Total Silver (Ag)	ug/L	120	<0.45	0.45	<0.090	0.090	<0.090	0.090	7677405
Dissolved Sodium (Na)	ug/L	-	2000000	500	790000	500	670000	500	7676179
Total Sodium (Na)	ug/L	-	2000000	500	780000	500	610000	500	7677405
Dissolved Strontium (Sr)	ug/L	-	15000	1.0	6600	1.0	9800	1.0	7676179
Total Strontium (Sr)	ug/L	-	17000	5.0	7400	1.0	10000	1.0	7677405
Dissolved Tellurium (Te)	ug/L	-	<1.0	1.0	<1.0	1.0	<1.0	1.0	7676179
Total Tellurium (Te)	ug/L	-	<5.0	5.0	<1.0	1.0	<1.0	1.0	7677405
Dissolved Thallium (Tl)	ug/L	-	<0.050	0.050	<0.050	0.050	<0.050	0.050	7676179
Total Thallium (Tl)	ug/L	-	<0.25	0.25	<0.050	0.050	<0.050	0.050	7677405
Dissolved Tin (Sn)	ug/L	-	<1.0	1.0	<1.0	1.0	<1.0	1.0	7676179
Total Tin (Sn)	ug/L	-	<5.0	5.0	1.6	1.0	<1.0	1.0	7677405
Dissolved Titanium (Ti)	ug/L	-	<5.0	5.0	<5.0	5.0	<5.0	5.0	7676179
Total Titanium (Ti)	ug/L	-	<25	25	31	5.0	28	5.0	7677405
Dissolved Tungsten (W)	ug/L	-	<1.0	1.0	2.1	1.0	<1.0	1.0	7676179
Total Tungsten (W)	ug/L	-	<5.0	5.0	2.2	1.0	<1.0	1.0	7677405
No Fill	No Exceedance Exceeds 1 criteria policy/level Exceeds both criteria/levels								
Grey									
Black									
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									



**BUREAU
VERITAS**

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID			RCC224		RCC225		RCC226		
Sampling Date			2021/10/29 12:30		2021/10/29 14:30		2021/10/29 16:40		
COC Number			852819-01-01		852819-01-01		852819-01-01		
	UNITS	Criteria	BH3D	RDL	BH7	RDL	BH6	RDL	QC Batch
Dissolved Uranium (U)	ug/L	-	0.46	0.10	11	0.10	0.15	0.10	7676179
Total Uranium (U)	ug/L	-	0.60	0.50	11	0.10	0.23	0.10	7677405
Dissolved Vanadium (V)	ug/L	-	<0.50	0.50	1.7	0.50	1.2	0.50	7676179
Total Vanadium (V)	ug/L	-	3.1	2.5	7.0	0.50	5.6	0.50	7677405
Dissolved Zinc (Zn)	ug/L	-	<5.0	5.0	<5.0	5.0	<5.0	5.0	7676179
Total Zinc (Zn)	ug/L	200	<25	25	13	5.0	9.7	5.0	7677405
Dissolved Zirconium (Zr)	ug/L	-	<1.0	1.0	<1.0	1.0	<1.0	1.0	7676179
Total Zirconium (Zr)	ug/L	-	<5.0	5.0	2.1	1.0	1.5	1.0	7677405
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									



BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		RCC224	RCC225	RCC226		
Sampling Date		2021/10/29 12:30	2021/10/29 14:30	2021/10/29 16:40		
COC Number		852819-01-01	852819-01-01	852819-01-01		
	UNITS	BH3D	BH7	BH6	RDL	QC Batch
Volatile Organics						
Chloroform	ug/L	<0.40	0.48	<0.40	0.40	7675386
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	96	95	95		7675386
D4-1,2-Dichloroethane	%	108	109	110		7675386
D8-Toluene	%	99	98	98		7675386
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

Bureau Veritas Job #: C1V8767
Report Date: 2022/05/25

exp Services Inc
Client Project #: BRM-00239423-F0
Site Location: ANN & HIGH 88, ON
Sampler Initials: TM

TEST SUMMARY

Bureau Veritas ID: RCC224
Sample ID: BH3D
Matrix: Water

Collected: 2021/10/29
Shipped:
Received: 2021/10/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	7676179	N/A	2021/11/05	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	7677405	N/A	2021/11/05	Arefa Dabhad
Total Suspended Solids	BAL	7675022	2021/11/02	2021/11/03	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	7675386	N/A	2021/11/03	Manpreet Sarao

Bureau Veritas ID: RCC225
Sample ID: BH7
Matrix: Water

Collected: 2021/10/29
Shipped:
Received: 2021/10/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	7676179	N/A	2021/11/05	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	7677405	N/A	2021/11/05	Arefa Dabhad
Total Suspended Solids	BAL	7675022	2021/11/02	2021/11/03	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	7675386	N/A	2021/11/03	Manpreet Sarao

Bureau Veritas ID: RCC226
Sample ID: BH6
Matrix: Water

Collected: 2021/10/29
Shipped:
Received: 2021/10/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	7676179	N/A	2021/11/05	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	7677405	N/A	2021/11/05	Arefa Dabhad
Total Suspended Solids	BAL	7675022	2021/11/02	2021/11/03	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	7675386	N/A	2021/11/03	Manpreet Sarao



GENERAL COMMENTS

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

Package 1	5.7°C
-----------	-------

Revised Report (2022/05/25): Mississauga Storm criteria policy has been added to this CofA as per Jeffrey Leon's request.

Sample RCC224 [BH3D] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample RCC225 [BH7] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly..

Sample RCC226 [BH6] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

QUALITY ASSURANCE REPORT

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

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
7675386	4-Bromofluorobenzene	2021/11/03	101	70 - 130	101	70 - 130	97	%				
7675386	D4-1,2-Dichloroethane	2021/11/03	106	70 - 130	100	70 - 130	106	%				
7675386	D8-Toluene	2021/11/03	103	70 - 130	105	70 - 130	99	%				
7675022	Total Suspended Solids	2021/11/03					<10	mg/L	15	25	95	85 - 115
7675386	Chloroform	2021/11/03	95	70 - 130	95	70 - 130	<0.20	ug/L				
7676179	Dissolved Aluminum (Al)	2021/11/05	94	80 - 120	101	80 - 120	<4.9	ug/L	13	20		
7676179	Dissolved Antimony (Sb)	2021/11/05	96	80 - 120	101	80 - 120	<0.50	ug/L	8.3	20		
7676179	Dissolved Arsenic (As)	2021/11/05	NC	80 - 120	97	80 - 120	<1.0	ug/L	0.99	20		
7676179	Dissolved Barium (Ba)	2021/11/05	93	80 - 120	97	80 - 120	<2.0	ug/L	5.3	20		
7676179	Dissolved Beryllium (Be)	2021/11/05	94	80 - 120	99	80 - 120	<0.40	ug/L	NC	20		
7676179	Dissolved Bismuth (Bi)	2021/11/05	89	80 - 120	93	80 - 120	<1.0	ug/L	NC	20		
7676179	Dissolved Boron (B)	2021/11/05	89	80 - 120	97	80 - 120	<10	ug/L	1.8	20		
7676179	Dissolved Cadmium (Cd)	2021/11/05	93	80 - 120	98	80 - 120	<0.090	ug/L	NC	20		
7676179	Dissolved Calcium (Ca)	2021/11/05	NC	80 - 120	98	80 - 120	<200	ug/L	1.7	20		
7676179	Dissolved Chromium (Cr)	2021/11/05	93	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
7676179	Dissolved Cobalt (Co)	2021/11/05	90	80 - 120	95	80 - 120	<0.50	ug/L	1.4	20		
7676179	Dissolved Copper (Cu)	2021/11/05	90	80 - 120	96	80 - 120	<0.90	ug/L	14	20		
7676179	Dissolved Iron (Fe)	2021/11/05	90	80 - 120	94	80 - 120	<100	ug/L	1.5	20		
7676179	Dissolved Lead (Pb)	2021/11/05	88	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
7676179	Dissolved Lithium (Li)	2021/11/05	95	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
7676179	Dissolved Magnesium (Mg)	2021/11/05	NC	80 - 120	97	80 - 120	<50	ug/L	0.66	20		
7676179	Dissolved Manganese (Mn)	2021/11/05	NC	80 - 120	101	80 - 120	<2.0	ug/L	1.7	20		
7676179	Dissolved Molybdenum (Mo)	2021/11/05	100	80 - 120	99	80 - 120	<0.50	ug/L	8.1	20		
7676179	Dissolved Nickel (Ni)	2021/11/05	88	80 - 120	95	80 - 120	<1.0	ug/L	1.2	20		
7676179	Dissolved Phosphorus (P)	2021/11/05	96	80 - 120	105	80 - 120	<100	ug/L	NC	20		
7676179	Dissolved Potassium (K)	2021/11/05	93	80 - 120	98	80 - 120	<200	ug/L	1.1	20		
7676179	Dissolved Selenium (Se)	2021/11/05	97	80 - 120	99	80 - 120	<2.0	ug/L	NC	20		
7676179	Dissolved Silicon (Si)	2021/11/05	92	80 - 120	99	80 - 120	<50	ug/L	1.0	20		
7676179	Dissolved Silver (Ag)	2021/11/05	47 (1)	80 - 120	99	80 - 120	<0.090	ug/L	NC	20		
7676179	Dissolved Sodium (Na)	2021/11/05	93	80 - 120	97	80 - 120	<100	ug/L	1.3	20		
7676179	Dissolved Strontium (Sr)	2021/11/05	92	80 - 120	98	80 - 120	<1.0	ug/L	3.4	20		

BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

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
7676179	Dissolved Tellurium (Te)	2021/11/05	91	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
7676179	Dissolved Thallium (Tl)	2021/11/05	90	80 - 120	95	80 - 120	<0.050	ug/L	NC	20		
7676179	Dissolved Tin (Sn)	2021/11/05	96	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
7676179	Dissolved Titanium (Ti)	2021/11/05	96	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
7676179	Dissolved Tungsten (W)	2021/11/05	95	80 - 120	96	80 - 120	<1.0	ug/L	2.2	20		
7676179	Dissolved Uranium (U)	2021/11/05	93	80 - 120	96	80 - 120	<0.10	ug/L	3.1	20		
7676179	Dissolved Vanadium (V)	2021/11/05	95	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
7676179	Dissolved Zinc (Zn)	2021/11/05	91	80 - 120	97	80 - 120	<5.0	ug/L	4.4	20		
7676179	Dissolved Zirconium (Zr)	2021/11/05	100	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
7677405	Total Aluminum (Al)	2021/11/04	106	80 - 120	103	80 - 120	<4.9	ug/L	4.5	20		
7677405	Total Antimony (Sb)	2021/11/04	107	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
7677405	Total Arsenic (As)	2021/11/04	104	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
7677405	Total Barium (Ba)	2021/11/04	103	80 - 120	100	80 - 120	<2.0	ug/L	3.9	20		
7677405	Total Beryllium (Be)	2021/11/04	107	80 - 120	103	80 - 120	<0.40	ug/L	NC	20		
7677405	Total Bismuth (Bi)	2021/11/04	101	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
7677405	Total Boron (B)	2021/11/04	104	80 - 120	101	80 - 120	<10	ug/L	4.5	20		
7677405	Total Cadmium (Cd)	2021/11/04	102	80 - 120	99	80 - 120	<0.090	ug/L	NC	20		
7677405	Total Calcium (Ca)	2021/11/04	NC	80 - 120	100	80 - 120	<200	ug/L	3.7	20		
7677405	Total Chromium (Cr)	2021/11/04	99	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
7677405	Total Cobalt (Co)	2021/11/04	102	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
7677405	Total Copper (Cu)	2021/11/04	99	80 - 120	95	80 - 120	<0.90	ug/L	4.3	20		
7677405	Total Iron (Fe)	2021/11/04	103	80 - 120	98	80 - 120	<100	ug/L	2.4	20		
7677405	Total Lead (Pb)	2021/11/04	99	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
7677405	Total Lithium (Li)	2021/11/04	101	80 - 120	101	80 - 120	<5.0	ug/L	6.9	20		
7677405	Total Magnesium (Mg)	2021/11/04	111	80 - 120	98	80 - 120	<50	ug/L	0.36	20		
7677405	Total Manganese (Mn)	2021/11/04	106	80 - 120	100	80 - 120	<2.0	ug/L	5.1	20		
7677405	Total Molybdenum (Mo)	2021/11/04	100	80 - 120	97	80 - 120	<0.50	ug/L	2.2	20		
7677405	Total Nickel (Ni)	2021/11/04	99	80 - 120	98	80 - 120	<1.0	ug/L	1.6	20		
7677405	Total Potassium (K)	2021/11/04	105	80 - 120	102	80 - 120	<200	ug/L	3.9	20		
7677405	Total Selenium (Se)	2021/11/04	104	80 - 120	101	80 - 120	<2.0	ug/L	NC	20		
7677405	Total Silicon (Si)	2021/11/04	103	80 - 120	99	80 - 120	<50	ug/L	8.5	20		

BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

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
7677405	Total Silver (Ag)	2021/11/04	99	80 - 120	97	80 - 120	<0.090	ug/L	NC	20		
7677405	Total Sodium (Na)	2021/11/04	NC	80 - 120	99	80 - 120	<100	ug/L	7.9	20		
7677405	Total Strontium (Sr)	2021/11/04	NC	80 - 120	98	80 - 120	<1.0	ug/L	3.4	20		
7677405	Total Tellurium (Te)	2021/11/04	107	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
7677405	Total Thallium (Tl)	2021/11/04	101	80 - 120	101	80 - 120	<0.050	ug/L	NC	20		
7677405	Total Tin (Sn)	2021/11/04	105	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
7677405	Total Titanium (Ti)	2021/11/04	98	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
7677405	Total Tungsten (W)	2021/11/04	107	80 - 120	103	80 - 120	<1.0	ug/L	NC	20		
7677405	Total Uranium (U)	2021/11/04	101	80 - 120	104	80 - 120	<0.10	ug/L	6.4	20		
7677405	Total Vanadium (V)	2021/11/04	102	80 - 120	98	80 - 120	<0.50	ug/L	7.2	20		
7677405	Total Zinc (Zn)	2021/11/04	103	80 - 120	101	80 - 120	<5.0	ug/L	2.7	20		
7677405	Total Zirconium (Zr)	2021/11/04	108	80 - 120	103	80 - 120	<1.0	ug/L	NC	20		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

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

(1) Matrix Spike exceeds acceptance limits, probable matrix interference.



BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



CHAIN OF CUSTODY RECORD

Page 1 of 1

VERITAS		INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: #9590 exp Services Inc		Company Name: EXP Services Inc		Quotation #: B91716		Bureau Veritas Job #:		Bottle Order #:	
Attention: Accounts Payable		Attention: Jay Samarakkody		P.O. #:		852819		Barcode	
Address: 1595 Clark Blvd		Address: Thabiso Modise@exp.com		Project: BRM-00239423 -FO		COC #:		Project Manager:	
Brampton ON L6T 4V1		Tel: (905) 793-9800 Fax: (905) 793-0641		Project Name: Ann 3 High 86		C#52819-01-01		Patricia Legette	
Toll: (905) 793-9800		Email: AP@exp.com; Karen.Burke@exp.com		Site #: Thabiso Modise		Turnaround Time (TAT) Required:			
Email: AP@exp.com; Karen.Burke@exp.com		Email: Jay.Samarakkody@exp.com		ANALYSIS REQUESTED (PLEASE BE SPECIFIC):		Please provide advance notice for rush projects			
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY		Field Filtered (please circle):		Total Metals Analysis by /CPMS		Chloroform		Total Suspended Solids	
Regulation 153 (2011)		Other Regulations		Special Instructions		Metals /Hg /Cr.Vi		Total Metals (field filtered)	
☐ Table 1 ☐ Res/Park ☐ Medium/Fine		☐ CCME ☐ Sanitary Sewer Bylaw							
☐ Table 2 ☐ Ind/Comm ☐ Coarse		☐ Reg 558 ☐ Storm Sewer Bylaw							
☐ Table 3 ☐ Agri/Other ☐ For RSC		☐ MISA Municipality Peel							
☐ Table		☐ PWQO ☐ Reg 406 Table							
☐ Table		☐ Other							
Include Criteria on Certificate of Analysis (CM)? Y									
Sample Barcode Label		Sample (Location) Identification		Date Sampled		Time Sampled		Matrix	
1		BH 3D		29 Oct 2021		12:30		GW	
2		BH 7		"		14:30		GW	
3		BH 6		"		16:40		GW	
4									
5									
6									
7									
8									
9									
10									
29-Oct-21 09:24		Patricia Legette		CIV8767		NSG		ENV-1605	
* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)		Time		RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	
Thabiso Modise		21/10/21		19:20		Raj Mahajan		21/10/21	
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.		* 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 CHAIN DELAYS.		* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.		* jars used and not submitted		Laboratory Use Only	
Time Sensitive		Temperature (°C) on Receipt		Custody Seal		Yes		No	
6/5/6		Intact		Intact					
White: Bureau Veritas Yellow: Client		SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS							



29-Oct-21 09:24

Patricia Legette

C1V8767

- DSG ENV-1605

ENV-1605

C#856346 D1-D3

Only:

Bottle Order #:



Project Manager:

Patricia LeGette

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#30554 exp Services Inc	Company Name:	EXP Services Inc	Quotation #:	B91717
Attention:	Accounts Payable	Attention:	Jay Samarakkody	P.O. #:	STREAM 2
Address:	1595 Clark Blvd Brampton ON L6T 4V1	Address:	Thabiso.Modise@exp.com	Project:	BRM-00239423-F0
Tel:	(905) 793-9800	Tel:		Project Name:	ANN & HIGH 88, ON
Email:	AP@exp.com; Karen.Burke@exp.com	Email:	jay.samarakkody@exp.com	Site #:	Thabiso Modise
	Fax: (905) 793-0641	Fax:		Sampled By:	

Patricia Legette



CIV8767

DSG ENV-1605



C#856249-01-01

Only:

Bottle Order #:



856249

Project Manager:

Patricia Legette

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011) ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table _____			Other Regulations ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality <u>Peel</u> ☐ PWQO ☐ Reg 406 Table _____ ☐ Other _____			Special Instructions 		
Include Criteria on Certificate of Analysis (C/N)? <u>Y</u>								

WALSH CENTER FOR SCIENCE AND ENVIRONMENT										Comments			
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Total					# of Bottles			
1	BH 3D	9/Nov/2021	16:20	GW	✓							1	PLEASE ADD THIS/TH
2	BH 6	9/Nov/2021	17:30	GW	✓							1	SAMPLES TO JOB
3	BH 7	9/Nov/2021	18:20	GW	✓							1	CIV8767
4													
5													RUSH ANALYSIS (ONE
6													DAY)
7													
8													PLEASE INCLUDE COC
9													IN CERTIFICATE OF
10													ANALYSIS

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
THABISO, MODISE		21/11/09	17:55	Jasperd van Ham		2021/11/09	17:56		Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
										4/3/4	Present		
											Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS AN ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* 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.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

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

White: Bureau Veritas Yellow: Client



BUREAU
VERITAS

Bureau Veritas Job #: C1V8767

Report Date: 2022/05/25

exp Services Inc

Client Project #: BRM-00239423-F0

Site Location: ANN & HIGH 88, ON

Sampler Initials: TM

Exceedance Summary Table – Mississauga Storm Sewer
Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
BH3D	RCC224-02	Total Aluminum (Al)	1000	1500	25	ug/L
BH3D	RCC224-01	Total Suspended Solids	15	52	10	mg/L
BH7	RCC225-02	Total Aluminum (Al)	1000	3000	4.9	ug/L
BH7	RCC225-01	Total Suspended Solids	15	79	10	mg/L
BH6	RCC226-02	Total Aluminum (Al)	1000	3100	4.9	ug/L
BH6	RCC226-01	Total Suspended Solids	15	69	10	mg/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.



Your Project #: BRM-00239423-E0
Site Location: ANN ST & HIGH ST.
Your C.O.C. #: 836582-01-01

Attention: Samuel Lee

exp Services Inc
Brampton Branch
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Report Date: 2021/09/27
Report #: R6829747
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1J9203

Received: 2021/07/16, 13:46

Sample Matrix: Water
Samples Received: 5

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Date Extracted	Date Analyzed	
1,3-Dichloropropene Sum	4	N/A	2021/07/21	EPA 8260C m
Acid Extractables by GC/MS	2	2021/07/19	2021/07/20	CAM SOP-00332 EPA 8270 m
Chromium (VI) in Water	3	N/A	2021/07/20	CAM SOP-00436 EPA 7199 m
Petroleum Hydro. CCME F1 & BTEX in Water	1	N/A	2021/07/20	CAM SOP-00315 CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1)	1	2021/07/20	2021/07/21	CAM SOP-00316 CCME PHC-CWS m
Mercury	3	2021/07/20	2021/07/20	CAM SOP-00453 EPA 7470A m
Dissolved Metals by ICPMS	3	N/A	2021/07/21	CAM SOP-00447 EPA 6020B m
Volatile Organic Compounds in Water	4	N/A	2021/07/20	CAM SOP-00228 EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta



Your Project #: BRM-00239423-E0
Site Location: ANN ST & HIGH ST.
Your C.O.C. #: 836582-01-01

Attention: Samuel Lee

exp Services Inc
Brampton Branch
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Report Date: 2021/09/27
Report #: R6829747
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1J9203

Received: 2021/07/16, 13:46

Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Patricia Legette
Project Manager
27 Sep 2021 17:33:48

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

Patricia Legette, Project Manager

Email: Patricia.Legette@bureauveritas.com

Phone# (905)817-5799

=====

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

O.REG 153 CHLOROPHENOLS (WATER)

BV Labs ID		QCV806	QCV809		
Sampling Date		2021/07/15	2021/07/16		
COC Number		836582-01-01	836582-01-01		
	UNITS	MW1	MW5D	RDL	QC Batch
Phenolics					
2-Chlorophenol	ug/L	<0.1	<0.1	0.1	7470729
2,4-Dichlorophenol	ug/L	<0.1	<0.1	0.1	7470729
2,4,6-Trichlorophenol	ug/L	<0.1	<0.1	0.1	7470729
Pentachlorophenol	ug/L	<0.1	<0.1	0.1	7470729
2,4,5-Trichlorophenol	ug/L	<0.1	<0.1	0.1	7470729
Surrogate Recovery (%)					
2,4,6-Tribromophenol	%	79	90		7470729
2-Fluorophenol	%	26 (1)	66		7470729
D5-Phenol	%	30	62		7470729
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
(1) Surrogate recovery was below the lower control limit due to matrix interference.					
This may represent a lower bias in some results.					



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

O.REG 153 METALS PACKAGE (WATER)

BV Labs ID				QCV806	QCV807	QCV809		
Sampling Date				2021/07/15	2021/07/15	2021/07/16		
COC Number				836582-01-01	836582-01-01	836582-01-01		
	UNITS	Criteria	Criteria-2	MW1	MW11	MW5D	RDL	QC Batch
Metals								
Chromium (VI)	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7472209
Mercury (Hg)	ug/L	10	0.4	<0.10	<0.10	<0.10	0.10	7472290
Dissolved Antimony (Sb)	ug/L	5000	-	1.6	1.6	0.91	0.50	7470299
Dissolved Arsenic (As)	ug/L	1000	20	1.7	1.7	1.3	1.0	7470299
Dissolved Barium (Ba)	ug/L	-	-	170	160	150	2.0	7470299
Dissolved Beryllium (Be)	ug/L	-	-	<0.40	<0.40	<0.40	0.40	7470299
Dissolved Boron (B)	ug/L	-	-	1800	2000	1400	10	7470299
Dissolved Cadmium (Cd)	ug/L	700	8	<0.090	<0.090	<0.090	0.090	7470299
Dissolved Chromium (Cr)	ug/L	5000	80	<5.0	<5.0	<5.0	5.0	7470299
Dissolved Cobalt (Co)	ug/L	5000	-	<0.50	<0.50	0.79	0.50	7470299
Dissolved Copper (Cu)	ug/L	3000	50	<0.90	<0.90	<0.90	0.90	7470299
Dissolved Lead (Pb)	ug/L	3000	120	<0.50	<0.50	<0.50	0.50	7470299
Dissolved Molybdenum (Mo)	ug/L	5000	-	7.1	6.6	3.5	0.50	7470299
Dissolved Nickel (Ni)	ug/L	3000	80	1.7	<1.0	1.5	1.0	7470299
Dissolved Selenium (Se)	ug/L	1000	20	<2.0	<2.0	<2.0	2.0	7470299
Dissolved Silver (Ag)	ug/L	5000	120	<0.090	<0.090	<0.090	0.090	7470299
Dissolved Sodium (Na)	ug/L	-	-	800000	820000	1300000	500	7470299
Dissolved Thallium (Tl)	ug/L	-	-	<0.050	<0.050	<0.050	0.050	7470299
Dissolved Uranium (U)	ug/L	-	-	1.7	1.6	2.5	0.10	7470299
Dissolved Vanadium (V)	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7470299
Dissolved Zinc (Zn)	ug/L	3000	40	<5.0	<5.0	<5.0	5.0	7470299
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: The Regional Municipality of Peel Sanitary Sewer Discharge. By-Law Number 53-2010.								
Criteria-2: The Regional Municipality of Peel Storm Sewer Discharge. By-Law Number 53-2010.								

BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

O.REG 153 PHCS, BTEX/F1-F4 (WATER)

BV Labs ID				QCV808		
Sampling Date				2021/07/16		
COC Number				836582-01-01		
	UNITS	Criteria	Criteria-2	MW35	RDL	QC Batch
BTEX & F1 Hydrocarbons						
Benzene	ug/L	10	2	<0.20	0.20	7471597
Toluene	ug/L	270	2	<0.20	0.20	7471597
Ethylbenzene	ug/L	160	2	<0.20	0.20	7471597
o-Xylene	ug/L	-	-	<0.20	0.20	7471597
p+m-Xylene	ug/L	-	-	<0.40	0.40	7471597
Total Xylenes	ug/L	-	4.4	<0.40	0.40	7471597
F1 (C6-C10)	ug/L	-	-	<25	25	7471597
F1 (C6-C10) - BTEX	ug/L	-	-	<25	25	7471597
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/L	-	-	<100	100	7473157
F3 (C16-C34 Hydrocarbons)	ug/L	-	-	<200	200	7473157
F4 (C34-C50 Hydrocarbons)	ug/L	-	-	<200	200	7473157
Reached Baseline at C50	ug/L	-	-	Yes		7473157
Surrogate Recovery (%)						
1,4-Difluorobenzene	%	-	-	100		7471597
4-Bromofluorobenzene	%	-	-	95		7471597
D10-o-Xylene	%	-	-	109		7471597
D4-1,2-Dichloroethane	%	-	-	105		7471597
o-Terphenyl	%	-	-	90		7473157
No Fill	No Exceedance					
Grey	Exceeds 1 criteria policy/level					
Black	Exceeds both criteria/levels					
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Criteria: The Regional Municipality of Peel Sanitary Sewer Discharge.						
By-Law Number 53-2010.						
Criteria-2: The Regional Municipality of Peel Storm Sewer Discharge.						
By-Law Number 53-2010.						



BV Labs Job #: C1J9203
Report Date: 2021/09/27

exp Services Inc
Client Project #: BRM-00239423-E0
Site Location: ANN ST & HIGH ST.
Sampler Initials: JB

O.REG 153 VOCs BY HS (WATER)

BV Labs ID				QCV806	QCV807	QCV809		
Sampling Date				2021/07/15	2021/07/15	2021/07/16		
COC Number				836582-01-01	836582-01-01	836582-01-01		
	UNITS	Criteria	Criteria-2	MW1	MW11	MW5D	RDL	QC Batch
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7468774
Volatile Organics								
Acetone (2-Propanone)	ug/L	-	-	22	46	<10	10	7466780
Benzene	ug/L	10	2	<0.20	<0.20	<0.20	0.20	7466780
Bromodichloromethane	ug/L	-	-	0.70	0.74	1.0	0.50	7466780
Bromoform	ug/L	-	-	<1.0	<1.0	<1.0	1.0	7466780
Bromomethane	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7466780
Carbon Tetrachloride	ug/L	-	-	<0.19	<0.19	<0.19	0.19	7466780
Chlorobenzene	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
Chloroform	ug/L	40	2	2.1	2.2	2.0	0.20	7466780
Dibromochloromethane	ug/L	-	-	<0.50	<0.50	0.61	0.50	7466780
1,2-Dichlorobenzene	ug/L	50	5.6	<0.40	<0.40	<0.40	0.40	7466780
1,3-Dichlorobenzene	ug/L	-	-	<0.40	<0.40	<0.40	0.40	7466780
1,4-Dichlorobenzene	ug/L	80	6.8	<0.40	<0.40	<0.40	0.40	7466780
Dichlorodifluoromethane (FREON 12)	ug/L	-	-	<1.0	<1.0	<1.0	1.0	7466780
1,1-Dichloroethane	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
1,2-Dichloroethane	ug/L	-	-	<0.49	<0.49	<0.49	0.49	7466780
1,1-Dichloroethylene	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<0.50	<0.50	<0.50	0.50	7466780
trans-1,2-Dichloroethylene	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7466780
1,2-Dichloropropane	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
cis-1,3-Dichloropropene	ug/L	-	-	<0.30	<0.30	<0.30	0.30	7466780
trans-1,3-Dichloropropene	ug/L	140	5.6	<0.40	<0.40	<0.40	0.40	7466780
Ethylbenzene	ug/L	160	2	<0.20	<0.20	<0.20	0.20	7466780
Ethylene Dibromide	ug/L	-	-	<0.19	<0.19	<0.19	0.19	7466780
Hexane	ug/L	-	-	<1.0	<1.0	<1.0	1.0	7466780
Methylene Chloride(Dichloromethane)	ug/L	2000	5.2	<2.0	<2.0	<2.0	2.0	7466780
Methyl Ethyl Ketone (2-Butanone)	ug/L	8000	-	<10	<10	<10	10	7466780
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: The Regional Municipality of Peel Sanitary Sewer Discharge. By-Law Number 53-2010.								
Criteria-2: The Regional Municipality of Peel Storm Sewer Discharge. By-Law Number 53-2010.								

BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

O.REG 153 VOCs BY HS (WATER)

BV Labs ID				QCV806	QCV807	QCV809		
Sampling Date				2021/07/15	2021/07/15	2021/07/16		
COC Number				836582-01-01	836582-01-01	836582-01-01		
	UNITS	Criteria	Criteria-2	MW1	MW11	MW5D	RDL	QC Batch
Methyl Isobutyl Ketone	ug/L	-	-	<5.0	<5.0	<5.0	5.0	7466780
Methyl t-butyl ether (MTBE)	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7466780
Styrene	ug/L	200	-	<0.40	<0.40	<0.40	0.40	7466780
1,1,1,2-Tetrachloroethane	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7466780
1,1,2,2-Tetrachloroethane	ug/L	1400	17	<0.40	<0.40	<0.40	0.40	7466780
Tetrachloroethylene	ug/L	1000	4.4	<0.20	<0.20	<0.20	0.20	7466780
Toluene	ug/L	270	2	<0.20	0.21	<0.20	0.20	7466780
1,1,1-Trichloroethane	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
1,1,2-Trichloroethane	ug/L	-	-	<0.40	<0.40	<0.40	0.40	7466780
Trichloroethylene	ug/L	400	8	<0.20	<0.20	<0.20	0.20	7466780
Trichlorofluoromethane (FREON 11)	ug/L	-	-	<0.50	<0.50	<0.50	0.50	7466780
Vinyl Chloride	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
p+m-Xylene	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
o-Xylene	ug/L	-	-	<0.20	<0.20	<0.20	0.20	7466780
Total Xylenes	ug/L	1400	4.4	<0.20	<0.20	<0.20	0.20	7466780
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	-	-	95	102	100		7466780
D4-1,2-Dichloroethane	%	-	-	102	105	99		7466780
D8-Toluene	%	-	-	92	96	99		7466780
No Fill	No Exceedance Exceeds 1 criteria policy/level Exceeds both criteria/levels							
Grey								
Black								
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Criteria: The Regional Municipality of Peel Sanitary Sewer Discharge. By-Law Number 53-2010.								
Criteria-2: The Regional Municipality of Peel Storm Sewer Discharge. By-Law Number 53-2010.								



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

O.REG 153 VOCs BY HS (WATER)

BV Labs ID				QCV809			QCV811		
Sampling Date				2021/07/16			2021/07/16		
COC Number				836582-01-01			836582-01-01		
	UNITS	Criteria	Criteria-2	MW5D Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch

Calculated Parameters

1,3-Dichloropropene (cis+trans)	ug/L	-	-				<0.50	0.50	7468774
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Volatile Organics

Acetone (2-Propanone)	ug/L	-	-	<10	10	7466780	<10	10	7466780
Benzene	ug/L	10	2	<0.20	0.20	7466780	<0.20	0.20	7466780
Bromodichloromethane	ug/L	-	-	1.1	0.50	7466780	<0.50	0.50	7466780
Bromoform	ug/L	-	-	<1.0	1.0	7466780	<1.0	1.0	7466780
Bromomethane	ug/L	-	-	<0.50	0.50	7466780	<0.50	0.50	7466780
Carbon Tetrachloride	ug/L	-	-	<0.19	0.19	7466780	<0.19	0.19	7466780
Chlorobenzene	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
Chloroform	ug/L	40	2	2.1	0.20	7466780	<0.20	0.20	7466780
Dibromochloromethane	ug/L	-	-	0.63	0.50	7466780	<0.50	0.50	7466780
1,2-Dichlorobenzene	ug/L	50	5.6	<0.40	0.40	7466780	<0.40	0.40	7466780
1,3-Dichlorobenzene	ug/L	-	-	<0.40	0.40	7466780	<0.40	0.40	7466780
1,4-Dichlorobenzene	ug/L	80	6.8	<0.40	0.40	7466780	<0.40	0.40	7466780
Dichlorodifluoromethane (FREON 12)	ug/L	-	-	<1.0	1.0	7466780	<1.0	1.0	7466780
1,1-Dichloroethane	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
1,2-Dichloroethane	ug/L	-	-	<0.49	0.49	7466780	<0.49	0.49	7466780
1,1-Dichloroethylene	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<0.50	0.50	7466780	<0.50	0.50	7466780
trans-1,2-Dichloroethylene	ug/L	-	-	<0.50	0.50	7466780	<0.50	0.50	7466780
1,2-Dichloropropane	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
cis-1,3-Dichloropropene	ug/L	-	-	<0.30	0.30	7466780	<0.30	0.30	7466780
trans-1,3-Dichloropropene	ug/L	140	5.6	<0.40	0.40	7466780	<0.40	0.40	7466780
Ethylbenzene	ug/L	160	2	<0.20	0.20	7466780	<0.20	0.20	7466780
Ethylene Dibromide	ug/L	-	-	<0.19	0.19	7466780	<0.19	0.19	7466780
Hexane	ug/L	-	-	<1.0	1.0	7466780	<1.0	1.0	7466780
Methylene Chloride(Dichloromethane)	ug/L	2000	5.2	<2.0	2.0	7466780	<2.0	2.0	7466780

No Fill

No Exceedance

Grey

Exceeds 1 criteria policy/level

Black

Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

Criteria: The Regional Municipality of Peel Sanitary Sewer Discharge.

By-Law Number 53-2010.

Criteria-2: The Regional Municipality of Peel Storm Sewer Discharge.

By-Law Number 53-2010.

BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

O.REG 153 VOCs BY HS (WATER)

BV Labs ID				QCV809			QCV811		
Sampling Date				2021/07/16			2021/07/16		
COC Number				836582-01-01			836582-01-01		
	UNITS	Criteria	Criteria-2	MW5D Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Methyl Ethyl Ketone (2-Butanone)	ug/L	8000	-	<10	10	7466780	<10	10	7466780
Methyl Isobutyl Ketone	ug/L	-	-	<5.0	5.0	7466780	<5.0	5.0	7466780
Methyl t-butyl ether (MTBE)	ug/L	-	-	<0.50	0.50	7466780	<0.50	0.50	7466780
Styrene	ug/L	200	-	<0.40	0.40	7466780	<0.40	0.40	7466780
1,1,1,2-Tetrachloroethane	ug/L	-	-	<0.50	0.50	7466780	<0.50	0.50	7466780
1,1,2,2-Tetrachloroethane	ug/L	1400	17	<0.40	0.40	7466780	<0.40	0.40	7466780
Tetrachloroethylene	ug/L	1000	4.4	<0.20	0.20	7466780	<0.20	0.20	7466780
Toluene	ug/L	270	2	<0.20	0.20	7466780	<0.20	0.20	7466780
1,1,1-Trichloroethane	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
1,1,2-Trichloroethane	ug/L	-	-	<0.40	0.40	7466780	<0.40	0.40	7466780
Trichloroethylene	ug/L	400	8	<0.20	0.20	7466780	<0.20	0.20	7466780
Trichlorofluoromethane (FREON 11)	ug/L	-	-	<0.50	0.50	7466780	<0.50	0.50	7466780
Vinyl Chloride	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
p+m-Xylene	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
o-Xylene	ug/L	-	-	<0.20	0.20	7466780	<0.20	0.20	7466780
Total Xylenes	ug/L	1400	4.4	<0.20	0.20	7466780	<0.20	0.20	7466780
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	-	-	99		7466780	100		7466780
D4-1,2-Dichloroethane	%	-	-	102		7466780	98		7466780
D8-Toluene	%	-	-	99		7466780	95		7466780
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
Criteria: The Regional Municipality of Peel Sanitary Sewer Discharge.									
By-Law Number 53-2010.									
Criteria-2: The Regional Municipality of Peel Storm Sewer Discharge.									
By-Law Number 53-2010.									

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VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

TEST SUMMARY

BV Labs ID: QCV806
Sample ID: MW1
Matrix: Water

Collected: 2021/07/15
Shipped:
Received: 2021/07/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7468774	N/A	2021/07/21	Automated Statchk
Acid Extractables by GC/MS	GC/MS	7470729	2021/07/19	2021/07/20	May Yin Mak
Chromium (VI) in Water	IC	7472209	N/A	2021/07/20	Lang Le
Mercury	CV/AA	7472290	2021/07/20	2021/07/20	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7470299	N/A	2021/07/21	Arefa Dabhad
Volatile Organic Compounds in Water	GC/MS	7466780	N/A	2021/07/20	Juan Pangilinan

BV Labs ID: QCV807
Sample ID: MW11
Matrix: Water

Collected: 2021/07/15
Shipped:
Received: 2021/07/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7468774	N/A	2021/07/21	Automated Statchk
Chromium (VI) in Water	IC	7472209	N/A	2021/07/20	Lang Le
Mercury	CV/AA	7472290	2021/07/20	2021/07/20	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7470299	N/A	2021/07/21	Arefa Dabhad
Volatile Organic Compounds in Water	GC/MS	7466780	N/A	2021/07/20	Juan Pangilinan

BV Labs ID: QCV808
Sample ID: MW35
Matrix: Water

Collected: 2021/07/16
Shipped:
Received: 2021/07/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7471597	N/A	2021/07/20	Anca Ganea
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7473157	2021/07/20	2021/07/21	Dennis Ngundu

BV Labs ID: QCV809
Sample ID: MW5D
Matrix: Water

Collected: 2021/07/16
Shipped:
Received: 2021/07/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7468774	N/A	2021/07/21	Automated Statchk
Acid Extractables by GC/MS	GC/MS	7470729	2021/07/19	2021/07/20	May Yin Mak
Chromium (VI) in Water	IC	7472209	N/A	2021/07/20	Lang Le
Mercury	CV/AA	7472290	2021/07/20	2021/07/20	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7470299	N/A	2021/07/21	Arefa Dabhad
Volatile Organic Compounds in Water	GC/MS	7466780	N/A	2021/07/20	Juan Pangilinan

BV Labs ID: QCV809 Dup
Sample ID: MW5D
Matrix: Water

Collected: 2021/07/16
Shipped:
Received: 2021/07/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds in Water	GC/MS	7466780	N/A	2021/07/20	Juan Pangilinan



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VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

TEST SUMMARY

BV Labs ID: QCV811
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2021/07/16
Shipped:
Received: 2021/07/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7468774	N/A	2021/07/21	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	7466780	N/A	2021/07/20	Juan Pangilinan



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

GENERAL COMMENTS

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

Package 1	5.7°C
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Revised Report (2021/09/27): Peel Sewer By Law criteria policy has been included in this CofA.

Results relate only to the items tested.

BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

QUALITY ASSURANCE REPORT

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7466780	4-Bromofluorobenzene	2021/07/20	101	70 - 130	103	70 - 130	100	%		
7466780	D4-1,2-Dichloroethane	2021/07/20	99	70 - 130	96	70 - 130	100	%		
7466780	D8-Toluene	2021/07/20	101	70 - 130	100	70 - 130	98	%		
7470729	2,4,6-Tribromophenol	2021/07/20	84	50 - 130	78	50 - 130	84	%		
7470729	2-Fluorophenol	2021/07/20	61	50 - 130	58	50 - 130	73	%		
7470729	D5-Phenol	2021/07/20	69	30 - 130	51	30 - 130	70	%		
7471597	1,4-Difluorobenzene	2021/07/20	99	70 - 130	98	70 - 130	99	%		
7471597	4-Bromofluorobenzene	2021/07/20	103	70 - 130	103	70 - 130	93	%		
7471597	D10-o-Xylene	2021/07/20	84	70 - 130	101	70 - 130	119	%		
7471597	D4-1,2-Dichloroethane	2021/07/20	101	70 - 130	96	70 - 130	107	%		
7473157	o-Terphenyl	2021/07/21	93	60 - 130	94	60 - 130	89	%		
7466780	1,1,1,2-Tetrachloroethane	2021/07/20	99	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
7466780	1,1,1-Trichloroethane	2021/07/20	104	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
7466780	1,1,2,2-Tetrachloroethane	2021/07/20	97	70 - 130	92	70 - 130	<0.40	ug/L	NC	30
7466780	1,1,2-Trichloroethane	2021/07/20	108	70 - 130	104	70 - 130	<0.40	ug/L	NC	30
7466780	1,1-Dichloroethane	2021/07/20	101	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7466780	1,1-Dichloroethylene	2021/07/20	110	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
7466780	1,2-Dichlorobenzene	2021/07/20	106	70 - 130	103	70 - 130	<0.40	ug/L	NC	30
7466780	1,2-Dichloroethane	2021/07/20	103	70 - 130	98	70 - 130	<0.49	ug/L	NC	30
7466780	1,2-Dichloropropane	2021/07/20	104	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
7466780	1,3-Dichlorobenzene	2021/07/20	106	70 - 130	105	70 - 130	<0.40	ug/L	NC	30
7466780	1,4-Dichlorobenzene	2021/07/20	122	70 - 130	120	70 - 130	<0.40	ug/L	NC	30
7466780	Acetone (2-Propanone)	2021/07/20	119	60 - 140	109	60 - 140	<10	ug/L	NC	30
7466780	Benzene	2021/07/20	101	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
7466780	Bromodichloromethane	2021/07/20	98	70 - 130	93	70 - 130	<0.50	ug/L	8.0	30
7466780	Bromoform	2021/07/20	89	70 - 130	77	70 - 130	<1.0	ug/L	NC	30
7466780	Bromomethane	2021/07/20	103	60 - 140	99	60 - 140	<0.50	ug/L	NC	30
7466780	Carbon Tetrachloride	2021/07/20	95	70 - 130	94	70 - 130	<0.19	ug/L	NC	30
7466780	Chlorobenzene	2021/07/20	108	70 - 130	105	70 - 130	<0.20	ug/L	NC	30
7466780	Chloroform	2021/07/20	103	70 - 130	99	70 - 130	<0.20	ug/L	4.8	30
7466780	cis-1,2-Dichloroethylene	2021/07/20	106	70 - 130	103	70 - 130	<0.50	ug/L	NC	30

BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7466780	cis-1,3-Dichloropropene	2021/07/20	112	70 - 130	102	70 - 130	<0.30	ug/L	NC	30
7466780	Dibromochloromethane	2021/07/20	89	70 - 130	85	70 - 130	<0.50	ug/L	3.7	30
7466780	Dichlorodifluoromethane (FREON 12)	2021/07/20	117	60 - 140	113	60 - 140	<1.0	ug/L	NC	30
7466780	Ethylbenzene	2021/07/20	108	70 - 130	108	70 - 130	<0.20	ug/L	NC	30
7466780	Ethylene Dibromide	2021/07/20	98	70 - 130	93	70 - 130	<0.19	ug/L	NC	30
7466780	Hexane	2021/07/20	113	70 - 130	108	70 - 130	<1.0	ug/L	NC	30
7466780	Methyl Ethyl Ketone (2-Butanone)	2021/07/20	121	60 - 140	114	60 - 140	<10	ug/L	NC	30
7466780	Methyl Isobutyl Ketone	2021/07/20	118	70 - 130	114	70 - 130	<5.0	ug/L	NC	30
7466780	Methyl t-butyl ether (MTBE)	2021/07/20	104	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
7466780	Methylene Chloride(Dichloromethane)	2021/07/20	118	70 - 130	112	70 - 130	<2.0	ug/L	NC	30
7466780	o-Xylene	2021/07/20	107	70 - 130	109	70 - 130	<0.20	ug/L	NC	30
7466780	p+m-Xylene	2021/07/20	112	70 - 130	112	70 - 130	<0.20	ug/L	NC	30
7466780	Styrene	2021/07/20	119	70 - 130	121	70 - 130	<0.40	ug/L	NC	30
7466780	Tetrachloroethylene	2021/07/20	96	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
7466780	Toluene	2021/07/20	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7466780	Total Xylenes	2021/07/20					<0.20	ug/L	NC	30
7466780	trans-1,2-Dichloroethylene	2021/07/20	108	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
7466780	trans-1,3-Dichloropropene	2021/07/20	122	70 - 130	109	70 - 130	<0.40	ug/L	NC	30
7466780	Trichloroethylene	2021/07/20	107	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
7466780	Trichlorofluoromethane (FREON 11)	2021/07/20	102	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7466780	Vinyl Chloride	2021/07/20	105	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7470299	Dissolved Antimony (Sb)	2021/07/21	106	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7470299	Dissolved Arsenic (As)	2021/07/21	99	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7470299	Dissolved Barium (Ba)	2021/07/21	101	80 - 120	102	80 - 120	<2.0	ug/L	1.3	20
7470299	Dissolved Beryllium (Be)	2021/07/21	103	80 - 120	96	80 - 120	<0.40	ug/L	NC	20
7470299	Dissolved Boron (B)	2021/07/21	98	80 - 120	94	80 - 120	<10	ug/L	1.9	20
7470299	Dissolved Cadmium (Cd)	2021/07/21	101	80 - 120	100	80 - 120	<0.090	ug/L	NC	20
7470299	Dissolved Chromium (Cr)	2021/07/21	96	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7470299	Dissolved Cobalt (Co)	2021/07/21	95	80 - 120	100	80 - 120	<0.50	ug/L	4.1	20
7470299	Dissolved Copper (Cu)	2021/07/21	98	80 - 120	98	80 - 120	<0.90	ug/L	NC	20
7470299	Dissolved Lead (Pb)	2021/07/21	95	80 - 120	97	80 - 120	<0.50	ug/L	NC	20



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7470299	Dissolved Molybdenum (Mo)	2021/07/21	103	80 - 120	98	80 - 120	<0.50	ug/L	2.8	20
7470299	Dissolved Nickel (Ni)	2021/07/21	94	80 - 120	98	80 - 120	<1.0	ug/L	2.2	20
7470299	Dissolved Selenium (Se)	2021/07/21	100	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
7470299	Dissolved Silver (Ag)	2021/07/21	90	80 - 120	97	80 - 120	<0.090	ug/L	NC	20
7470299	Dissolved Sodium (Na)	2021/07/21	NC	80 - 120	102	80 - 120	<100	ug/L	1.8	20
7470299	Dissolved Thallium (Tl)	2021/07/21	98	80 - 120	99	80 - 120	<0.050	ug/L	NC	20
7470299	Dissolved Uranium (U)	2021/07/21	97	80 - 120	95	80 - 120	<0.10	ug/L	3.3	20
7470299	Dissolved Vanadium (V)	2021/07/21	99	80 - 120	99	80 - 120	<0.50	ug/L	0.30	20
7470299	Dissolved Zinc (Zn)	2021/07/21	94	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7470729	2,4,5-Trichlorophenol	2021/07/20	93	50 - 130	81	50 - 130	<0.1	ug/L		
7470729	2,4,6-Trichlorophenol	2021/07/20	95	10 - 130	83	10 - 130	<0.1	ug/L		
7470729	2,4-Dichlorophenol	2021/07/20	90	50 - 130	76	50 - 130	<0.1	ug/L		
7470729	2-Chlorophenol	2021/07/20	79	50 - 130	78	50 - 130	<0.1	ug/L		
7470729	Pentachlorophenol	2021/07/20	94	50 - 130	88	50 - 130	<0.1	ug/L		
7471597	Benzene	2021/07/20	98	50 - 140	100	50 - 140	<0.20	ug/L	NC	30
7471597	Ethylbenzene	2021/07/20	105	50 - 140	111	50 - 140	<0.20	ug/L	NC	30
7471597	F1 (C6-C10) - BTEX	2021/07/20					<25	ug/L	NC	30
7471597	F1 (C6-C10)	2021/07/20	83	60 - 140	87	60 - 140	<25	ug/L	NC	30
7471597	o-Xylene	2021/07/20	102	50 - 140	106	50 - 140	<0.20	ug/L	NC	30
7471597	p+m-Xylene	2021/07/20	102	50 - 140	108	50 - 140	<0.40	ug/L	NC	30
7471597	Toluene	2021/07/20	94	50 - 140	98	50 - 140	<0.20	ug/L	NC	30
7471597	Total Xylenes	2021/07/20					<0.40	ug/L	NC	30
7472209	Chromium (VI)	2021/07/20	108	80 - 120	109	80 - 120	<0.50	ug/L	2.4	20
7472290	Mercury (Hg)	2021/07/20	94	75 - 125	93	80 - 120	<0.10	ug/L	NC	20
7473157	F2 (C10-C16 Hydrocarbons)	2021/07/21	84	60 - 130	88	60 - 130	<100	ug/L	NC	30
7473157	F3 (C16-C34 Hydrocarbons)	2021/07/21	85	60 - 130	91	60 - 130	<200	ug/L	NC	30



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7473157	F4 (C34-C50 Hydrocarbons)	2021/07/21	91	60 - 130	95	60 - 130	<200	ug/L	NC	30
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement. Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference. Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy. Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination. Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency. NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration) NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times$ RDL).										



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

16-Jul-21 13:46

Ema Gitej



C1J9203

KTN ENV-1241

Presence of Visible Particulate/Sediment

Maxxam Analytics

CAM FCD-01013/5

Page 1 of 1

When there is >1cm of visible particulate/sediment, the amount will be recorded in the field below

Bottle Types

	Sample ID	All	Inorganics					Organics										Hydrocarbons								Volatiles				Other
			CrVI	CN	General	Hg	Metals (Diss.)	Organic 1 of 2	Organic 2 of 2	PCB 1 of 2	PCB 2 of 2	Pest/ Herb 1 of 2	Pest/ Herb 2 of 2	SVOC/ ABN 1 of 2	SVOC/ ABN 2 of 2	PAH 1 of 2	PAH 2 of 2	Dioxin /Furan	F1 Vial 1	F1 Vial 2	F1 Vial 3	F1 Vial 4	F2-F4 1 of 2	F2-F4 2 of 2	F4G	VOC Vial 1	VOC Vial 2	VOC Vial 3	VOC Vial 4	
1	MW1							TS																		TS	TS	TS		
2	MW11																									TS	TS	TS		
3	MW35	TS																												
4	MW50							TS	TS																	TS	TS	TS		
5																														
6																														
7																														
8																														
9																														
10																														

Comments:

Legend:

P	Suspended Particulate
TS	Trace Settled Sediment (just covers bottom of container or less)
S	Sediment greater than (>) Trace, but less than (<) 1 cm

Recorded By: (signature/print)

E VITRINI

16-Jul-21 13:46

Patricia Legette



C1J9203

Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-6700 Toll-free 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CHAIN OF CUSTODY RECORD

Page 1 of 1

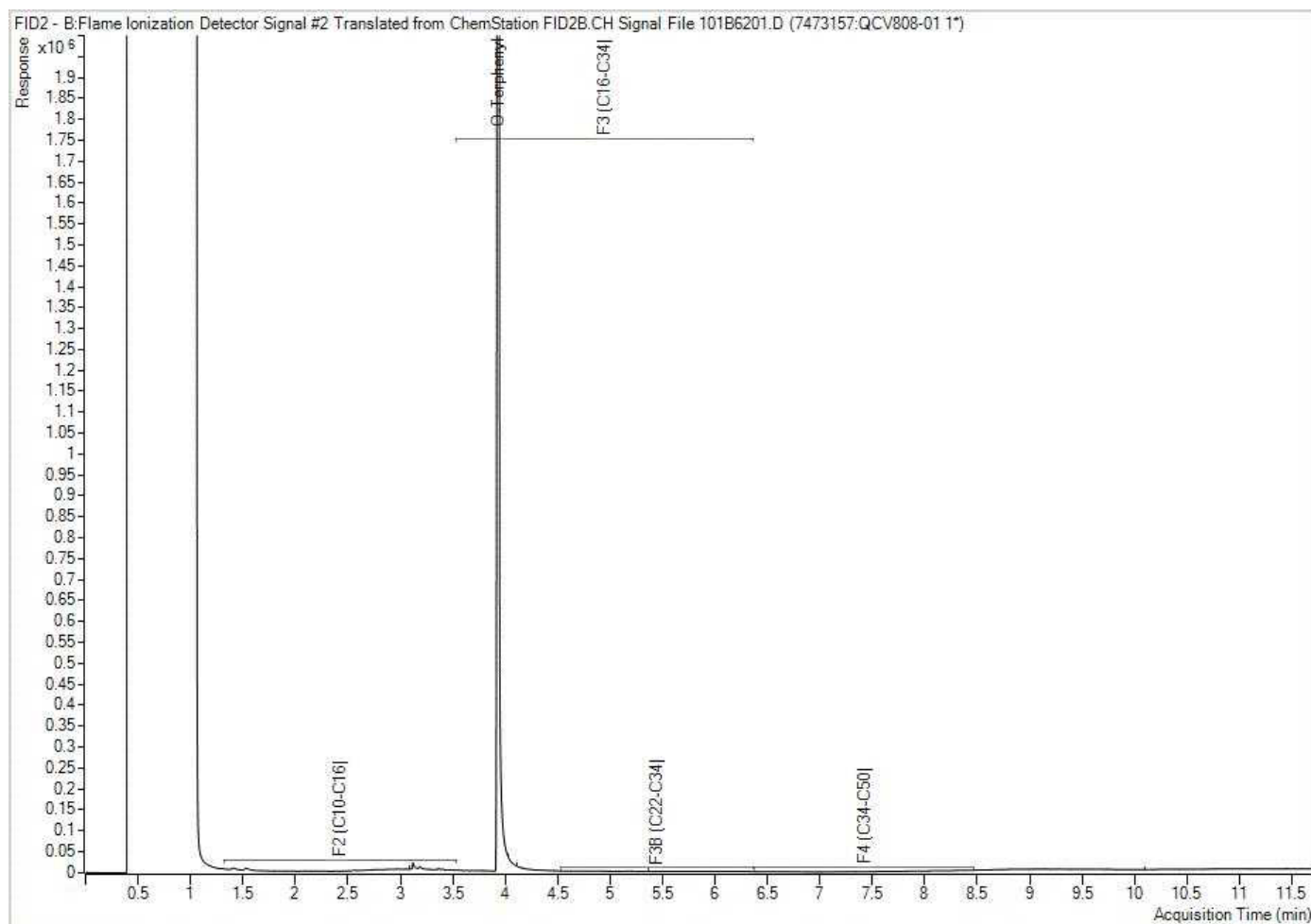
REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: EXP	Attention: Samuel Lee	Quotation #: B91716 STREAM 3	BV Labs Job #:	Bottle Order #:	
Address: 1595 CLARK BLVD	Address: BRM	P.O. #:	COC #:		Project Manager:
Tel: (905) 793-9800	Tel: (905) 793-9800	Project Name: ANN ST & HIGH ST.	C#836582-01-01		Patricia Legette
Email: AP@exp.com; Karen.Burke@exp.com	Email: Samuel.Lee@exp.com	Site #: JB			
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY					
Regulation 153 (2011) ☐ Table 1 ☒ Res/Park ☒ Medium/Fine ☒ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table _____		Other Regulations ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality _____ ☐ PWDO ☐ Reg 406 Table _____ ☐ Other _____		Special Instructions 	
Include Criteria on Certificate of Analysis (Y/N)? 		ANALYSIS REQUESTED (PLEASE BE SPECIFIC) Metals / Hg / Cr / V Metals Package Acid Extractables by GC/MS VOCs by HS PHCs, BTEX/F, F4 Chlorophenols		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 #)	
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr / V
1	MW1	JULY 15, 21	AM	GW	yes
2	MW11	JULY 15, 21	AM	GW	yes
3	MW35	JULY 16, 21	AM	GW	
4	MW50	JULY 16, 21	AM	GW	yes
5	Trip Blank				
6					
7					
8					
9					
10					
* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	
JILIAN BARNETT		July 16, 21	1:45pm	PATRICIA LEGETTE	
				Date: (YY/MM/DD)	Time
				21/07/16	13:46
# jars used and not submitted		Laboratory Use Only		ON ICE	
		Time Sensitive		Temperature (°C) on Receipt	
				3/6/18	
		Custody Seal		Yes No	
		Present			
		Intact			
		White: BV Labs		Yellow: Client	
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS. * 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. ** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.					

Bureau Veritas Canada (2019) Inc.

BV Labs Job #: C1J9203
Report Date: 2021/09/27
BV Labs Sample: QCV808

exp Services Inc
Client Project #: BRM-00239423-E0
Project name: ANN ST & HIGH ST.
Client ID: MW35

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.



BUREAU
VERITAS

BV Labs Job #: C1J9203

Report Date: 2021/09/27

exp Services Inc

Client Project #: BRM-00239423-E0

Site Location: ANN ST & HIGH ST.

Sampler Initials: JB

Exceedance Summary Table – Peel Region Sanitary 2010

Result Exceedances

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						
The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.						

Exceedance Summary Table – Peel Region Storm 2010

Result Exceedances

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	UNITS
MW1	QCV806-04	Chloroform	2	2.1	0.20	ug/L
MW11	QCV807-04	Chloroform	2	2.2	0.20	ug/L
MW5D	QCV809-04-Lab Dup	Chloroform	2	2.1	0.20	ug/L
The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.						

Appendix E – Construction and Post-Construction Flow Rate Calculations

APPENDIX E-1: Short-Term Flow Rate

High Street & Ann Street, Mississauga
BRM-00239423-E0

Table E-1-1: Flow from Construction Dewatering System

Parameters	Symbols	Unit	Value
Geological Formation	-	-	Glacial Deposit
Ground Elevation	-	mASL	82.3
Lowest Top Slab Elevation	-	mASL	66.0
Highest Groundwater Elevation	-	mASL	81.0
Lowest Footing Elevation	-	mASL	64.5
Base of the Water-Bearing Zone	-	mASL	60.5
Height of Static Water Table Above the Base of the Water-Bearing Zone	H	m	20.5
Dewatering Target Elevation	-	mASL	63.5
Height of Target Water Level Above the Base of Water-Bearing Zone	h_w	m	3.0
Hydraulic Conductivity	K	m/s	1.9E-07
Length of Excavation	-	m	51.0
Width of Excavation	-	m	81.0
Equivalent Radius (equivalent perimeter)	r_e	m	42.02
Method to Calculate Radius of Influence	-	-	Cooper-Jacob
Time (30 days)	t	s	2,592,000
Specific Yield	Sy		0.05
Cooper-Jacob's Radius of Influence from Sides of Excavation	R_{cj}	m	21.3
Radius of Influence	R_o	m	63.3
Dewatering Flow Rate (unconfined radial flow component)	Q	m ³ /day	51.7
Factor of Safety	fs	-	2.00
Dewatering Flow Rate (multiplied by factor of safety)	Q.fs	m ³ /day	103.4
Precipitation Event	-	mm/day	15
Volume from Precipitation	-	m ³ /day	62.0
Dewatering Flow Rate Without Safety Factor (including stormwater collection)	-	m ³ /day	113.7
Dewatering Flow Rate With Safety Factor (including stormwater collection)	-	m ³ /day	165.35

Notes:

mASL - meters above sea level

Analytical Solution for Estimating Radial Flow from an Unconfined Aquifer to a Fully-Penetrating Excavation

$$Q_w = \frac{\pi K (H^2 - h^2)}{\ln \left[\frac{R_o}{r_e} \right]} \quad \text{(Based on the Dupuit-Forcheimer Equation)}$$

$$r_e = \frac{a+b}{\pi} \quad R_o = R_{cj} + r_e \quad R_{cj} = \sqrt{2.25 K D t / S}$$

Where:

Q_w = Flow rate per unit length of excavation (m³/s)

K = Hydraulic conductivity (m/s)

H = Height of static water table above base of water-bearing zone (m)

h_w = Height of target water level above the base of water-bearing zone (m)

R_{cj} = Cooper Jacob Radius of Influence (m)

R_o = Radius of influence (m)

r_e = Equivalent perimeter (m)

APPENDIX E-2: Long-Term Flow Rate

High Street & Ann Street, Mississauga
BRM-00239423-E0

Table E-2-1: Flow from Under-Slab Drain System

Parameters	Symbols	Unit	Value
Geological Formation	-	-	Glacial Deposit
Ground Elevation	-	mASL	82.30
Lowest Top Slab Elevation	-	mASL	66.00
Highest Groundwater Elevation	-	mASL	81.00
Lowest Footing Elevation	-	mASL	64.50
Base of the Water-Bearing Zone	-	mASL	60.50
Height of Static Water Table Above the Base of the Water-Bearing Zone	H	m	20.50
Dewatering Target Elevation	-	mASL	65.50
Height of Target Water Level Above the Base of Water-Bearing Zone	h _w	m	5.00
Hydraulic Conductivity	K	m/s	9.5E-08
Length of Excavation	-	m	51.00
Width of Excavation	-	m	81.00
Equivalent Radius (equivalent perimeter)	r _e	m	42.02
Method to Calculate Radius of Influence	-	-	Cooper-Jacob
Time (180 days)	t	s	15,552,000
Specific Yield	Sy		0.05
Cooper-Jacob's Radius of Influence from Sides of Excavation	Rcj	m	36.92
Radius of Influence	Ro	m	78.93
Dewatering Flow Rate (unconfined radial flow component)	Q	m ³ /day	16.16
Factor of Safety	fs	-	1.50
Dewatering Flow Rate (multiplied by factor of safety)	Q.fs	m ³ /day	24.2
Dewatering Flow Rate Without Safety Factor (no stormwater collection)	-	m ³ /day	16.16
Dewatering Flow Rate With Safety Factor (no stormwater collection)	-	m ³ /day	24.25

Notes:
mASL - meters above sea level

Analytical Solution for Estimating Radial Flow from an Unconfined Aquifer to a Fully-Penetrating Excavation

$$Q_w = \frac{\pi K (H^2 - h^2)}{Ln \left[\frac{R_o}{r_e} \right]}$$
$$r_e = \frac{a+b}{\pi} \qquad R_o = R_{cj} + r_e$$

(Based on the Dupuit-Forcheimer Equation)

$$R_{cj} = \sqrt{2.25 K D t / S}$$

Where:

Q_w = Flow rate per unit length of excavation (m³/s)

K = Hydraulic conductivity (m/s)

H = Height of static water table above base of water-bearing zone (m)

h_w = Height of target water level above the base of water-bearing zone (m)

Rcj=Cooper Jacob Radius of Influence (m)

R_o=Radius of influence (m)

re=Equivalent perimeter (m)