PRELIMINARY HYDROGEOLOGICAL INVESTIGATION

914 Bathurst Street,
Toronto, Ontario, M5R 3G5

Client

Mr. Nate Pace
Stafford Bathurst Inc.
55 St. Clair Avenue West, Suite 200
Toronto, Ontario, M4V 2Y7

Project Number

BIGC-ENV-520A

Prepared By:

B.I.G. Consulting Inc.
5500 Tomken Road, Unit 12
Mississauga, ON, L4W 2Z4
T: 416.214.4880
www.bigconsutlinginc.com

Date Submitted

April 22, 2022

Table of Contents

List of Figures

List of Appendices

1 Introduction

1.1 Project Description

B.I.G. Consulting Inc. (BIG) was retained by Stafford Bathurst Inc. (the Client) to conduct a Preliminary Hydrogeological Investigation to support the proposed development of the site located at 914 Bathurst Street, Toronto, Ontario, M5R 3G5 (Site).

The Site is located north of Barton Avenue and west of Bathurst Street, in Toronto, Ontario. The Site measures approximately 1,640 m² in size. The Site is currently occupied by one (1) seven-storey residential building with one (1) level of underground parking (the Site building). The areas surrounding the Site building are covered with asphalt and landscaping. Figure 1 shows the Site location.

It is our understanding that the proposed re-development at the Site will consist of one (1) ten-storey mid-rise residential building with two (2) levels of underground parking.

Once the existing building is demolished and final design drawings are available, additional investigation and re-evaluation of dewatering rates will be required.

The following investigations previously completed for the subject Site were reviewed by BIG:

- Preliminary Geotechnical Investigation, 914 Bathurst Street, Toronto, Ontario, prepared by Exp Services Inc. (Exp), dated June 30, 2017;
- Phase II Environmental Site Assessment, 914 Bathurst Street, Toronto, Ontario, prepared by Exp, dated July 18, 2017; and,
- Preliminary Hydrogeological Investigation, 914 Bathurst Street, Toronto, Ontario, prepared by Exp, dated August 4, 2017.

1.2 Project Objectives

The main objectives of the Hydrogeological Investigation were to:

a) Establish the subsurface geological and hydrogeological conditions at the expected foundation elevation;
b) Assess groundwater quality and compare the results to both Storm and Sanitary Sewer Use Bylaw for the City of Toronto;
c) Assessment of any potential construction dewatering flow rates;
d) Assessment of foundation sub-drain discharge volumes, if applicable; and,
e) Prepare a Preliminary Hydrogeological Investigation Report.

1.3 Scope of Work

To achieve the investigation objectives, BIG proposed and initiated the following scope of work:

a) Review available geological and hydrogeological information for the Site;
b) Utilizing pre-existing monitoring wells drilled at the Site by Exp to investigate the subsurface groundwater conditions;
c) Advancement of three (3) boreholes (BH101 to BH103) to a maximum depth of 18.9 m bgs and installation of three (3) monitoring wells (MW101 to MW103);
d) Perform single well response tests (SWRT) at selected monitoring wells to assess the hydraulic characteristics of the saturated soils at the Site;
e) Evaluate the information of groundwater level measurements and groundwater quality;

f) Collection of one (1) groundwater sample for laboratory testing and compare it against the City of Toronto Storm and Combined/Sanitary Sewer Use By-Law parameters;
g) Initiation of three (3)-month biweekly groundwater monitoring;
h) Assess groundwater discharges during construction phases;
i) Assess foundation sub-drain discharge volumes; and,
j) The preparation of a Preliminary Hydrogeological Investigation Report.

1.4 Previous Reports

1.4.1 Exp Preliminary Geotechnical Investigation

Exp completed a Preliminary Geotechnical Investigation at the Site, dated June 30, 2017, that consisted of advancement of four (4) boreholes (BH1S, BH1D, BH2, BH3) to a maximum depth of 15.7 m and installation of four (4) monitoring wells (BH1S, BH1D, BH2, BH3).

1.4.2 Exp Phase II Environmental Site Assessment

Exp completed a Preliminary Geotechnical Investigation at the Site, dated June 30, 2017, that consisted of advancement of four (4) boreholes (BH1S, BH1D, BH2, BH3) to a maximum depth of 15.7 m and installation of four (4) monitoring wells (BH1S, BH1D, BH2, BH3).

1.4.3 Exp Preliminary Hydrogeological Investigation

Exp completed a Preliminary Hydrogeological Investigation at the Site, dated August 4, 2017, that consisted of using previously installed monitoring wells to conduct SWRTs, complete two (2) rounds of groundwater level measurements and collection of a groundwater quality sample.

2 Regional Setting

2.1 Regional Physiography

The Ontario Geological Survey Map P. 2204, indicates the Site lies in the Iroquois Plain physiographic region of Southern Ontario known as the sand plains. Figure 2 shows the physiographic regions of Southern Ontario around the Site.

During the last retreat of the Laurentide Ice Sheet (12,000 years B.P.) lake levels in what was to become Lake Ontario were much higher due to ice blockage in the St. Lawrence waterway. This created the glacial Lake Iroquois which was up to 60 m higher in elevation in the Toronto area than current Lake Ontario water levels. The Iroquois Shoreline that coincided with the elevated lake, terminated north of the Site and just below St. Clair Avenue West.

2.2 Regional Geology

The surficial geology of the immediate area around the Site is described as coarse-textured glaciolacustrine deposits consisting of sand, gravel, minor silt and clay, foreshore and basinal deposits. The surficial geology for the Site and surrounding areas is shown on Figure 3.

Bedrock of the region corresponds to the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member and Eastview Member consisting of shale, limestone, dolostone and siltstone. The contact between the bedrock and the overlying overburden is expected to be at approximately 80 m bgs.

2.3 Regional Hydrogeology

Groundwater movement through the subsurface is controlled by hydraulic gradients, the physical characteristics of the sediments, and the interconnectedness of lithological formations. Fine grained sediments restrict lateral movement of groundwater and induce vertical infiltration, while coarse grained sediments allow vertical flow with increased transmissivity.

The regional shallow groundwater flow is expected to follow the local topography and discharge to local area creeks and streams. Local deviation from the regional groundwater flow directions may occur in response to changes in topography and/or soil stratigraphy, as well as the presence of surface water features and/or existing subsurface infrastructure.

No local aquifers were identified that could negatively impact the subject Site.

3 Site Setting

3.1 Site Topography and Drainage

The Site is rectangular in shape and has an area of approximately 1,640 m². The Site is currently occupied by one (1) seven-storey residential building with one (1) level of underground parking (the Site buildings). The areas surrounding the Site building are covered with asphalt and landscaping. The Site is relatively flat-lying and based on the borehole logs, the ground elevation ranges between 117.37 m and 117.09 m above sea level (asl). The land slopes towards the south and does not feature any surface water bodies. Precipitation that falls on the Site is inferred to be directed to the nearby City of Toronto catch basins.

3.2 Local Surface Water Features

The Site does not feature any surface water bodies on or adjacent to the Site. The closest surface water body to the Site is Cedarvale Ravine, located approximately 2.2 km north of the Site. The Site is situated within the Lake Ontario Waterfront and is not within a Toronto Regional Conservation Authority Regulated Area.

3.3 Ministry of Environment, Conservation and Parks Water Well Review

Well Records from the Ministry of Environment, Conservation and Parks (MECP) Water Well Record Database (WWR) were reviewed to determine the number of water wells and locations present within a 500 m radius of the Site boundaries.

The MECP WWR database indicated 59 well records within a 500 m radius of the Site. All identified wells are shown on Figure 4. A summary of the Water Well Records is included in Appendix B, Table B-1. A review of the records indicated that the majority of the wells were classified for observation well, monitoring well and test hole purposes within 500 m radius of the Site. No supply wells were identified within a 500 m radius of the Site.

3.4 Permit to Take Water and Environmental Activity and Sector Registry Search

The MECP also maintains a database of all active and expired Permit to Take Water (PTTW) and Environmental Activity and Sector Registry (EASR) items related to construction dewatering and pumping test. There are eleven (11) PTTW registrations and twelve (12) EASR registrations within 1 km of the Site and are summarized in Table B-2, Appendix B. The location for each registration is shown on Figure 5.

4 Field Program

4.1 Borehole and Monitoring Well Details

BIG advanced three (3) boreholes (BH101 to BH103) to a maximum depth of 18.9 m bgs between March 21 and 25, 2022 and instrumented all three (3) boreholes with a monitoring well (MW101 to MW103). The boreholes were advanced by using a truck mounted drill rig using solid stem and hollow stem continuous flight auger equipment under the direction and supervision of BIG field personnel. Soil samples were retrieved at regular intervals with a 50 mm outside diameter split barrel sampler drive and accordance with the Standard Penetration Test Procedure (ASTM D1586). The samples were logged in the field and returned to the BIG laboratory for detailed visual examination. The borehole records and monitoring well construction details are included in Appendix A.

The following monitoring wells were previously installed at the Site:

a) Four (4) monitoring wells (BH1S, BH1D, BH2, and BH3) installed by EXP to a maximum depth of 15.7 m bgs in 2017.

It should be noted that BH2 was destroyed. All remaining available monitoring wells were utilized in this Hydrogeological Investigation.

Figure 6 is a detailed Borehole/Monitoring Well Location Map of the Site. The borehole logs are attached in Appendix A.

The ground elevation at the existing and newly installed monitoring wells were surveyed by BIG personnel with reference to the geodetic benchmark station: 12219740648 AKA CT648 with a published geodetic elevation of 117.546 m asl located at the northeast corner at Barton Avenue and Albany Avenue.

For the purposes of this report, BIG has utilized the geodetic elevation for the boreholes and monitoring wells based on the BIG survey as presented below. It should be noted that geodetic elevations were referenced throughout this report for all discussions related to surface elevations and groundwater elevation.

Monitoring Well ID	Ground Elevation from Exp's Borehole Logs (m asl)	Ground Elevation Based on BIG Survey (m asl)
BH1D	117.33	117.37
BH1S	117.36	117.34
BH2	117.28	117.24
BH3	117.09	117.09

4.2 Site Specific Overburden Geology

The borehole locations are shown on Figure 6 and detailed subsurface conditions are presented on the borehole logs in Appendix A. The following table is provided in addition to the borehole descriptions to provide a general summary of the soil conditions. The soil descriptions are predominately based on BIG's investigation, however, where applicable soil conditions encountered during previous investigation by others are included. The soil boundaries indicated on the borehole logs and discussed herein are inferred from the visual observations and auger resistance and should not be regarded as exact planes of geological change.

The soil conditions encountered at the borehole locations are summarized below. A stratigraphic cross-section across the property as aligned on Figure 6 is included as Figure 7.

Table 4-1: Soil description

Layer	Description
Ground Surface	Boreholes BH101 to BH103, were advanced through an existing ground surface cover consisting of approximately 50 mm thick asphalt overlying 50 mm thick granular base.
Fill	Below the ground surface cover at all borehole locations, existing fill was encountered that generally extended to depths varying between 1.8 m to 3.1 m bgs. The existing fill material predominantly consisted of silty sand with trace clay and gravel.
Silty Sand/Sandy Silt Till	Below the fill at all borehole locations a glacial deposit of silty sand/sandy silt till was encountered that extended to depths varying between 6.1 m and 12.2 m bgs.
Upper Silty Clay/Clayey Silt Till	Below the silty sand/sandy silt till at all borehole locations, another glacial deposit of upper silty clay/clayey silt till was encountered that extended to depths varying between 7.6 m and 16.8 m bgs.
Upper Sand/Sandy Silt	Below the upper silty clay/clayey silt till at all borehole locations, a deposit of upper sand/sandy silt was encountered that extended to depths varying between 12.2 m and 18.9 m bgs. Borehole BH/MW101 was terminated within the upper sand/sandy silt layer.
Lower Silty Clay/Clayey Silt Till	Below the sand/sandy silt in BH/MW102 and BH/MW103, another glacial deposit of lower silty clay/clayey silt till was encountered that extended to an approximate depth of 16.8 m bgs.
Lower Sand	Below the lower silty clay/clay silt till deposit in borehole BH/MW102, another deposit of sand was encountered there extended to the borehole termination depth of 18.6 m bgs.
Lower Silty Sand Till	Below the lower silty clay/clayey silt till deposit in borehole BH/MW103, another deposit of lower silty sand till was encountered that extended to the borehole termination depth of 18.8 m bgs.

4.3 Water Level Monitoring

Water levels at all monitoring well locations were recorded after installation. A summary of all available water level observations is included in Table 4-2. Groundwater was observed in all monitoring wells on April 1, 2022, and depths to the groundwater ranged from 3.71 m to 9.73 m bgs. The groundwater elevations for shallow monitoring wells, BH/MW101, BH/MW102, BH1S, and BH3 range from 113.63 m to 107.51 m asl. The groundwater elevations of deep monitoring wells BH1D and BH/MW103, range from 108.51 m to 107.71 m asl.

It should be noted that a three (3)-month groundwater monitoring program is currently on-going.

An interpreted groundwater contour map for the water level measurements recorded on April 1, 2022, is included as Figure 8. Based on the water level measurements obtained, the inferred direction of groundwater flow across the Site is interpreted to be to the southwest direction.

Seasonal variability can produce significant changes to the static water level. It has been observed that groundwater can rise and lower in response to changing weather and climate.

Table 4-2: **Monitoring Well Details and Water Levels Elevations**

Well ID	Elevation (m asl)	Well Depth (m)	Coordinates (NAD27-76 Adj. MTM10)		March 28, 2022		April 1, 2022	
			Easting	Northing	Water Level (m bgs)	Water Level (m asl)	Water Level (m bgs)	Groundwater Elevation (m asl)
BH/MW101	117.24	10.7	311801.3	4836244.3	8.30	108.94	9.73	107.51
BH/MW102	117.14	10.7	311795.9	4836264.2	5.90	111.24	5.64	111.50
BH/MW103	117.18	18.3	311825.2	4836277.8	9.53	107.65	9.47	107.71
BH1S	117.34	9.3	311796.7	4836275.6	3.78	113.56	3.71	113.63
BH1D	117.37	14.9	311793.7	4836274.8	8.92	108.45	8.86	108.51
BH2	117.24	11.1	311801.0	4836253.9	Destroyed		Destroyed	
BH3	117.09	7.7	311836.3	4836265.9	4.13	112.96	4.08	113.01

4.4 Hydraulic Conductivity Testing

The hydraulic conductivity test was completed to estimate the saturated hydraulic conductivity (K) of the soil at the well screen depth at selected monitoring well locations.

Given that slug tests provided adequate aquifer properties, a pump test was not required.

In advance of performing SWRT, the monitoring well was developed to remove the potential presence of fine sediments. The development process involved purging of the monitoring wells to induce the flow of fresh formation water through the screen. The monitoring well water level was permitted to fully recover prior to performing SWRTs.

During the SWRT, a slug of water was instantaneously removed from the well and the response to the water level is recorded. The Hydraulic Conductivity values for each of the tested wells were calculated from the SWRT data using Aqtesolv Software and the Hvorslev and Bouwer-Rice solutions for unconfined conditions. The semi-log plots for normalized drawdown versus time are included in Appendix C.

The summary of the hydraulic conductivity (K) values estimated from the SWRTs are provided below in Table 4-3:

Table 4-3: Summary of Hydraulic Conductivity (K) Testing Results

Monitoring Well	Well Depth (m bgs)	Hydraulic Conductivity (m/s)
BH/MW101	10.7	5.46×10^{-7}
BH/MW102	10.7	7.69×10^{-7}
BH/MW103	18.3	1.77×10^{-7}
BH1S	9.3	9.73×10^{-7}
BH1D	14.9	6.77×10^{-7}
BH3	7.7	3.69×10^{-7}
Geometric mean K value except deep wells (m/s)		**6.23×10^{-7}**

The SWRT provides an estimate of K for the geological formation in the immediate media zone surrounding the well screen and may not be representative of bulk formation hydraulic conductivities.

4.5 Groundwater Sampling

To assess the suitability for discharge of pumped groundwater to the City of Toronto Sanitary or Storm Sewer during dewatering activities, a groundwater sample was collected from BH/MW102 on March 28, 2022.

Prior to collection of the samples, approximately three (3) standing well volumes of groundwater were purged from the well. The sample was collected and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required.

The sample was not field filtered. Dedicated nitrile gloves were used during sample handling. The groundwater sample was submitted to an independent laboratory, Bureau Veritas Laboratories, of Mississauga, Ontario, for analysis.

For the assessment purposes, the analytical results were compared to Table 1 – Limits for Sanitary and Combined Sewer Discharge (amended 2002-10-31 by By-Law No. 855-2002; 2010-07-08 by By-Law No.868-2010; 2016-02-4 by By-Law No.100-2016); and Table 2 – Limits for Storm Sewer Discharge (amended 2010-07-08 by By-Law No 868-2010; 2016-02-4 by By-Law No. 100-2016) of Toronto Municipal Code (Toronto Municipal Code Chapter 681, Sewers, 2016).

The laboratory Certificate of Analysis (CofAs) and chain of custody are enclosed in Appendix D.

The laboratory CofAs show that there were no exceedances against the Table 1 – Limits for Sanitary and Combined Sewer Discharge.

When compared against the more stringent Table 2 – Limits for Storm Sewer Discharge, the sample indicated exceedances for total suspended solid (TSS), and total manganese. A summary of the exceedances is provided in Table 4-4.

Table 4-4: Summary of Analytical Results

Parameter	Limits for Sanitary and Combined Sewer Discharge (mg/L) (Table 1)	Limits for Storm Sewer Discharge (mg/L) (Table 2)	Concentration for BH/MW102 (mg/L) (March 28, 2022)
Total Suspended Solids (TSS)	350	15	**47**
Total Manganese (Mn)	5	0.05	**0.14**

Notes:
***Bold** indicates concentration exceeds the Storm Sewer Discharge Limit.*
***Bold** and <u>underline</u> indicate concentration exceeds the Sanitary Discharge Limit.*

The Site is located within the combined sewer service area, if the groundwater encountered during the construction dewatering is discharged to the City of Toronto combined sewer, no treatment of the groundwater will be required.

It is noted that an agreement to discharge to the City of Toronto will be required prior to discharging dewatering effluent, which includes both storm and groundwater.

5 Temporary Construction Dewatering

5.1 Construction Dewatering Requirements

It is our understanding that the proposed re-development at the Site will consist of one (1) ten-storey mid-rise residential building with two (2) levels of underground parking. The P2 finished floor elevation (FFE) is assumed 7 m bgs. The footing elevation is assumed approximately 2 m below FFE. The groundwater elevations for shallow monitoring wells, BH/MW101, BH/MW102, BH1S, and BH3 range from 113.63 m to 107.51 m asl. The groundwater elevations of deep monitoring wells BH1D and BH/MW103, range from 108.51 m to 107.71 m asl. For conservative purposes, the construction dewatering calculation is based on an open cut excavation at the present time. To excavate under dry conditions, the water level is anticipated to be lowered approximately 1.0 m below the footing elevation.

Additional dewatering capacity may be required to maintain dry conditions within the excavation during and following significant precipitation events. It should be noted that the dewatering estimates provided in this report are based on the conceptual building information available at this time. If design details are changed (including any changes to excavation depth), the dewatering estimates must be revised to include the final layout of the development.

5.2 Construction Dewatering Flow Rate Assumptions

The assumptions used for the calculation of the dewatering rate for the proposed development are presented in Table 5-1.

Table 5-1 Dewatering Estimate Assumptions

Input Parameter	Values	Notes
Lowest Surface Elevation (m asl)	117.09	Based on borehole logs
P2 FFE (m asl)	110.09	Assumed 7 m bgs
Footing Elevation (m asl)	108.09	Assumed 2.0 m below FFE
Dewatered Elevation Target (m asl)	107.09	Approximate 1 m below footing
Groundwater Elevation (m asl)	113.63	Highest groundwater elevation on April 1, 2022
Estimated Excavation Area	41 m x 39 m	Based on aerial extent of the Site
Hydraulic Conductivity (m/s)	6.23×10^{-7}	Geometric mean K

5.3 Dewatering Flow Rate Equation

The Dupuit equation for steady flow from a radial source of an excavation through an unconfined aquifer resting on a horizontal impervious surface was used to obtain a flow rate estimate, and is expressed as follows:

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

Where:

Q_w = Rate of pumping (m^3/s)

K = Hydraulic conductivity (m/sec)

H = Head beyond the influence of pumping (static groundwater elevation) (m)

h = Head above base of aquifer at the excavation (m)

Ro = Distance of Influence (m)

r_e = Effective radius (m)

It is expected that the initial dewatering rate will be higher in order 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 locally from storage resulting in lower seepage rates into the excavation. Additionally, the use of a continuous caisson shoring system will further reduce groundwater migration into the excavation reducing the ongoing seepage rate.

5.4 Radius of Influence

The Radius of Influence (ROI) for the construction dewatering is based on the empirical Sichardt Equation. This equation is used to predict the distance at which the drawdown resulting from pumping is negligible. This equation is empirical and was developed to provide representative flow rates using the steady state flow dewatering equations, as discussed below.

It is noted that in steady state conditions, the radius of influence of pumping will extend until boundary flow conditions are reached and provide sufficient water inputs to the aquifer, such as recharge and surface water bodies. As a result, the distance of influence calculated using Sichardt equation is used to provide a representative flow rate calculation, but it is not precise in determining the actual radius influenced by pumping.

The ROI of pumping (dewatering) for radial flow is calculated based on the Sichardt equation, which is described as follows:

$$\mathrm{Lo} = 3000\ (\mathrm{H} - \mathrm{h})\sqrt{\mathrm{K}}$$

Where:

K = Hydraulic conductivity (m/s)

H = Static Saturated Head (m)

h = Dynamic Saturated Head (m)

Based on the Sichardt equation and the geometric mean K value, the ROI is approximately 41 m from the centre of the excavation for radial flow. The ROI calculation is provided in Appendix E.

The ROI calculation is a conservative methodology and is calculated based on the assumption of active pumping during the construction dewatering. It should be noted that most of the water will be pumped during the first stage of the construction period or when a rain event occurs. Although the ROI was conservatively predicted as 41 m from the centre of the excavation, over a period of time, the drawdown curve will be very close to the bottom of the excavation and thus resulting in negligible ROI. The likelihood for impacts to the nearby structures are negligible.

5.5 Results of Construction Dewatering Flow Rate Estimates

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

Table 5-2 Summary of Construction Dewatering Flow Rate Estimate

Location	Construction Dewatering Flow Rate Without Safety Factor (L/day)	Peak Construction Dewatering Flow Rate Including Safety Factor of 3 (L/day)
Excavation area	34,000	102,000

Construction dewatering flow rate estimates are provided in Table E-1, in Appendix E.

The peak construction dewatering flow rate includes a factor of safety of 3 to account for precipitation, seasonal fluctuations in the groundwater table, flow from beddings of existing sewers, and variation in hydrogeological properties beyond those encountered during the course of this study. This total dewatering flow rate also provides additional capacity for the dewatering contractors. Given that the predicted dewatering volume exceeds the 50,000 L/day limit, an EASR for construction dewatering will be required.

It should be noted that if caisson wall shoring system is considered for the subject Site, reduction in groundwater quantities can be anticipated.

Please note that it is the responsibility of the contractor to ensure dry conditions are maintained within the excavation at all times.

Additional pumping capacity may be required to maintain dry conditions within the excavation during and following significant precipitation events. Additionally, the presence of near-surface fill material could hold significant groundwater.

The maximum flow calculation is intended to provide a conservative estimate to account for unforeseeable conditions that may arise during construction. It should be noted that the dewatering estimate provided in this report are based on the proposed development information available at this time. If changes to the design are implemented (e.g., increase to planned excavation depths, widening of excavations, etc.), the dewatering estimates must be revised to include and reflect future changes.

6 Long Term Discharge Estimate

6.1 Long-Term Dewatering Assumptions

It is our understanding that the below grade structure at the Site will be built as water-tight with the raft slab, therefore, no long-term groundwater discharges will be required.

7 Potential Groundwater Impacts

7.1 Impacts to Nearby Groundwater Users

The Site lies within a heavily urbanized area of Toronto, which features 100 % municipal water supply. There are no expected impacts to nearby groundwater users due to active dewatering. No supply water wells were identified within 500 m.

7.2 Impacts to Nearby Structures

The ROI calculation is a conservative methodology and is calculated based on the assumption of active pumping during the construction dewatering. It should be noted that most of the water will be pumped during the first stage of the construction period or when a rain event occurs. Although the ROI was conservatively predicted as 41 m from the centre of the excavation, over a period of time, the drawdown curve will be very close to the bottom of the excavation and thus resulting in negligible ROI. The likelihood for impacts to the nearby structures are negligible.

8 Water Taking and Discharge Permits

8.1 EASR

During the active construction dewatering phase, the volume of water expected to be pumped exceeds the daily limit on groundwater taking under the Ontario Water Resources Act (50,000 L/day) if the excavation is to be undertaken all at once. Therefore, it is necessary to register the construction dewatering under the EASR guidelines, as cumulative discharge rate for construction is 102,000 L/day. The limit for water taking under an EASR is 400,000 L/day. If combined storm and groundwater were to exceed this limit, the dewatering rate would need to be capped to 400,000 L/day of pumped water. If it is necessary to exceed 400,000 L/day of water taking, a Permit to Take Water as per O.Reg.387/04 would be required.

8.2 City of Toronto Sewer Discharge Agreement

The City of Toronto describes any water source not supplied by the City as private water. This includes groundwater and storm water that accumulates on a property. If private water is to be discharged into a City of Toronto sanitary or storm sewer, a permit under the City of Toronto Municipal Code, Chapter 681 must be granted. The discharge agreement features two types of approvals:

- Short Term Private Water Discharge Approval which covers temporary arrangements for activities such as construction dewatering, road work, etc.; and,
- Long Term Private Water Discharge Approval which is intended to cover long term discharges from building foundation drains and other applications.

Given the current consideration for short-term discharge, a Private Water Discharge Approval (PWDS) with the City of Toronto will be required.

9 Conclusions

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

a) It is our understanding that the proposed re-development at the Site will consist of one (1) ten-storey mid-rise residential building with two (2) levels of underground parking;
b) The Site is located within a physiographic region within the Iroquois Plain known as the sand plain;
c) The surficial geology around the Site is comprised of coarse-textured glaciolacustrine deposits consisting of sand, gravel, minor silt and clay, foreshore and basinal deposits;
d) The MECP WWR database indicate that there are 59 well records registered with the database within 500 m of the Site. The majority of the wells were classified for observation well, monitoring well, and test hole purposes. No supply wells were identified within a 500 m radius of the Site;
e) The groundwater elevations for shallow monitoring wells, BH/MW101, BH/MW102, BH1S, and BH3 range from 113.63 m to 107.51 m asl. The groundwater elevations of deep monitoring wells, BH1D and BH/MW103 range from 108.51 m to 107.71 m asl (April 1, 2022 readings);
f) Based on the water level measurements obtained, the inferred direction of groundwater flow across the Site is interpreted to be to the southwest direction;
g) The estimated hydraulic conductivity of the soil ranges from 9.73×10^{-7} m/s to 1.77×10^{-7} m/s with a geometric mean of 6.23×10^{-7} m/s;
h) Based on the assumptions outlined in this report, the estimated peak construction dewatering flow rate including rainfall for the proposed construction activity is 102,000 L/day;
i) It is our understanding that the below grade structure at the Site will be built as water-tight with the raft slab, therefore, no long-term groundwater discharges will be required;
j) The laboratory CofA shows no exceedances for under Table 1 – Limits for Sanitary Sewer Discharge;
k) When compared against the more stringent Table 2 – Limits for Storm Sewer Discharge, the sample indicated exceedances for total suspended solid (TSS), and total manganese (Mn);
l) The Site is located within the combined sewer service area, if the groundwater encountered during the construction dewatering is discharged to the City of Toronto combined sewer, no treatment of the groundwater will be required; and,
m) A sewer discharge agreement with the City of Toronto Water division will be required for the short-term discharge.

It should be noted that the comments and recommendations in this report are based on the assumption that the present design concept described throughout the report will proceed to construction. Any changes to the design concept may result in a modification to the recommendations provided in this report. It is noted that these conclusions and recommendations should be read in conjunction with the entirety of the report.

10 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 conclusion and recommendations presented within this report reflect Site conditions existing at the time of the assessment. BIG must be contacted immediately if any unforeseen Site conditions are experienced during the dewatering activities. This will allow BIG 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 BIG, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience profession. No other warranty or presentation, either expressed or implied, is included or intended in this report.

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

Yours truly,

B.I.G. Consulting Inc.

Peilin (Eileen) Liu, M.Env.Sc., P.Geo.
Project Manager

Prem Manicks, P.Geo.
Partner

11 References

Cashman, P. M. (2013). *Groundwater Lowering in Construction: A Practical Guide to Dewatering (Second Ed.).*

Chapman, L., & Putnam, D. (2007). Physiography of Southern Ontario. *Miscellaneous Release, Data 228 ISBN 978-1-4249-5158-1*. Ontario Geological Survey.

City of Toronto. (2011). *Chapter 681 – Sewer Use Bylaw.*

Ministry of Environment, Conservation and Parks. (2017). Ontario Water Resources Act.

Ontario Water Resources Act, Ontario Regulation 387/04, as amended. (2016). *Water Taking and Transfer*.

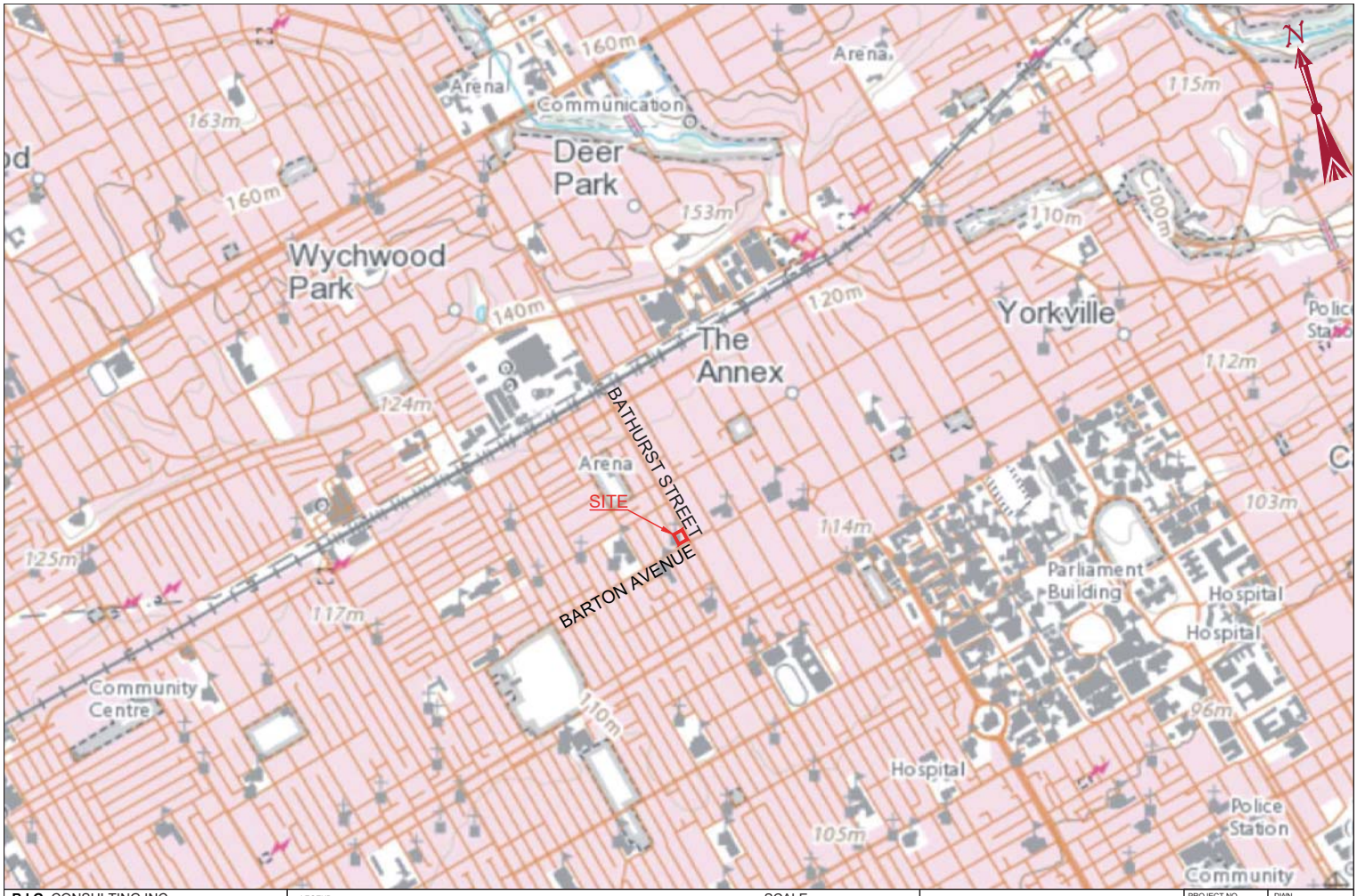
Ontario Ministry of Environment, Conservation and Parks, Map: Well Records, 2018. Accessed online at https://www.ontario.ca/environment-and-energy/map-well-records

Preliminary Geotechnical Investigation, 914 Bathurst Street, Toronto, Ontario, prepared by Exp Services Inc. (Exp), dated June 30, 2017.

Phase II Environmental Site Assessment, 914 Bathurst Street, Toronto, Ontario, prepared by Exp, dated July 18, 2017.

Preliminary Hydrogeological Investigation, 914 Bathurst Street, Toronto, Ontario, prepared by Exp, dated August 4, 2017.

FIGURES



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

SITE BOUNDARY

SCALE

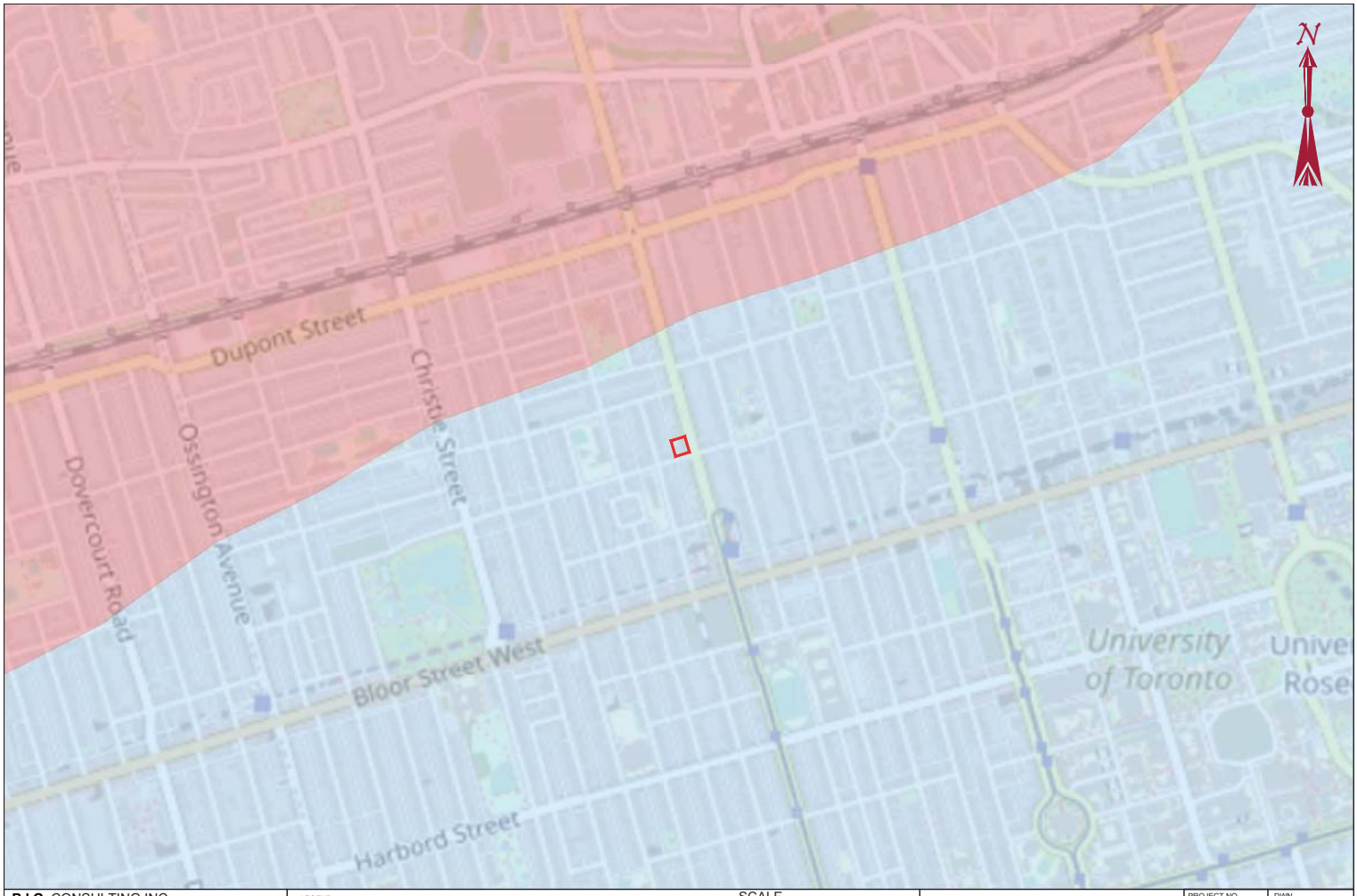
150m 0m 150m 300m 450m 600m 750m

IMAGERY OBTAINED FROM TOPORAMA, NATURAL RESOURCES CANADA, 2017

TITLE AND LOCATION

SITE LOCATION PLAN
PRELIMINARY
HYDROGEOLOGICAL
INVESTIGATION
914 BATHURST STREET,
TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	1



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

- SITE BOUNDARY
- SOUTH SLOPE
- IROQUOIS PLAIN

SCALE

100m 0m 100m 200m 300m 400m 500m

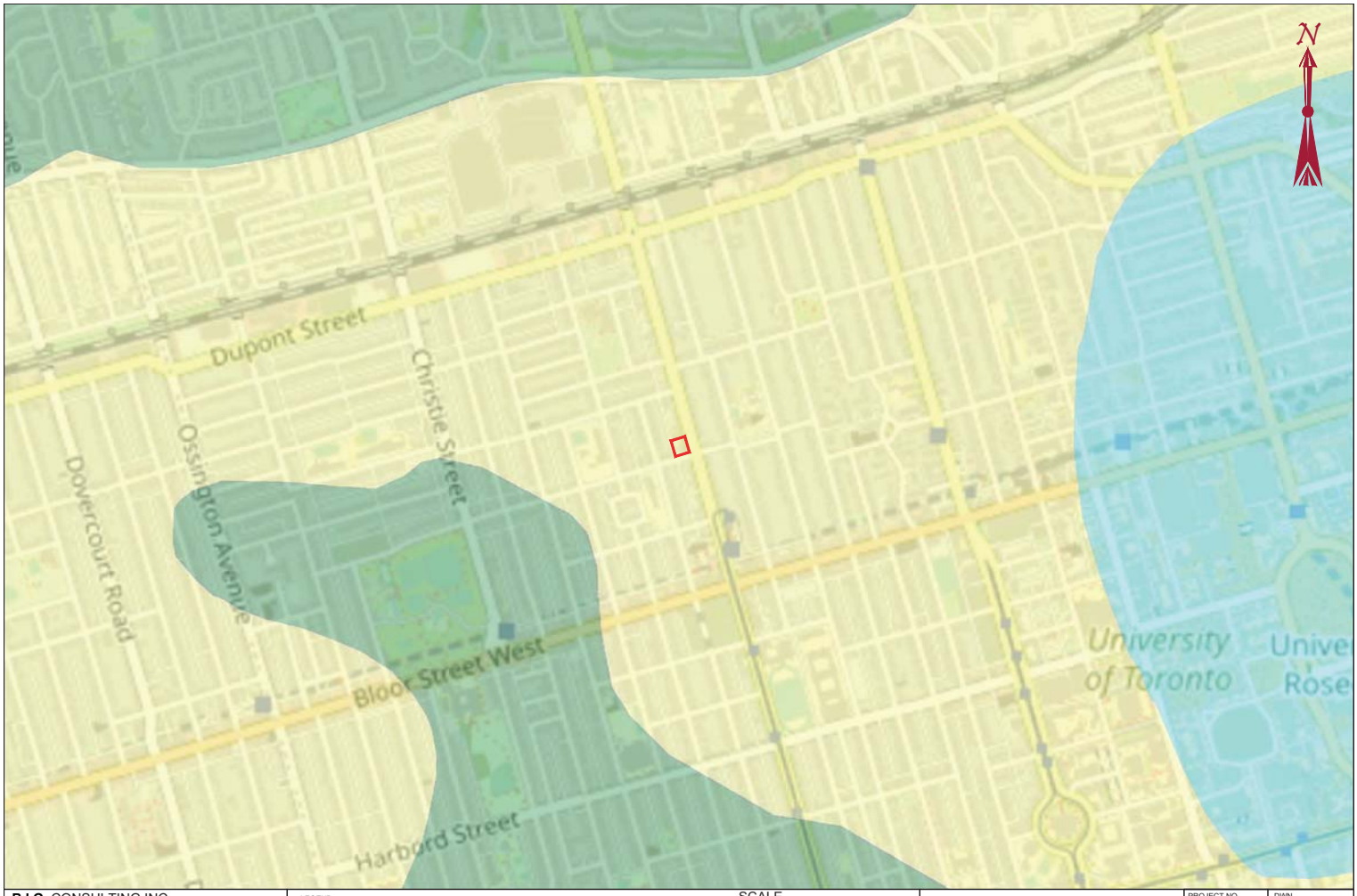
NOTES:
1. PHYISIOGRAPHIC REGIONS PRODUCED BY MINISTRY OF ENERGY, NORTHERN DEVELOPMENT AND MINES, 2012
2. IMAGERY OBTAINED FROM OPENSTREETMAP, 2016

TITLE AND LOCATION

PHYSIOGRAPHIC REGIONS OF SOUTHERN ONTARIO

PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	2



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

- SITE BOUNDARY
- COARSE-TEXTURED GLACIOLACUSTRINE DEPOSITS
- FINE-TEXTURED GLACIOLACUSTRINE DEPOSITS
- TILL

SCALE

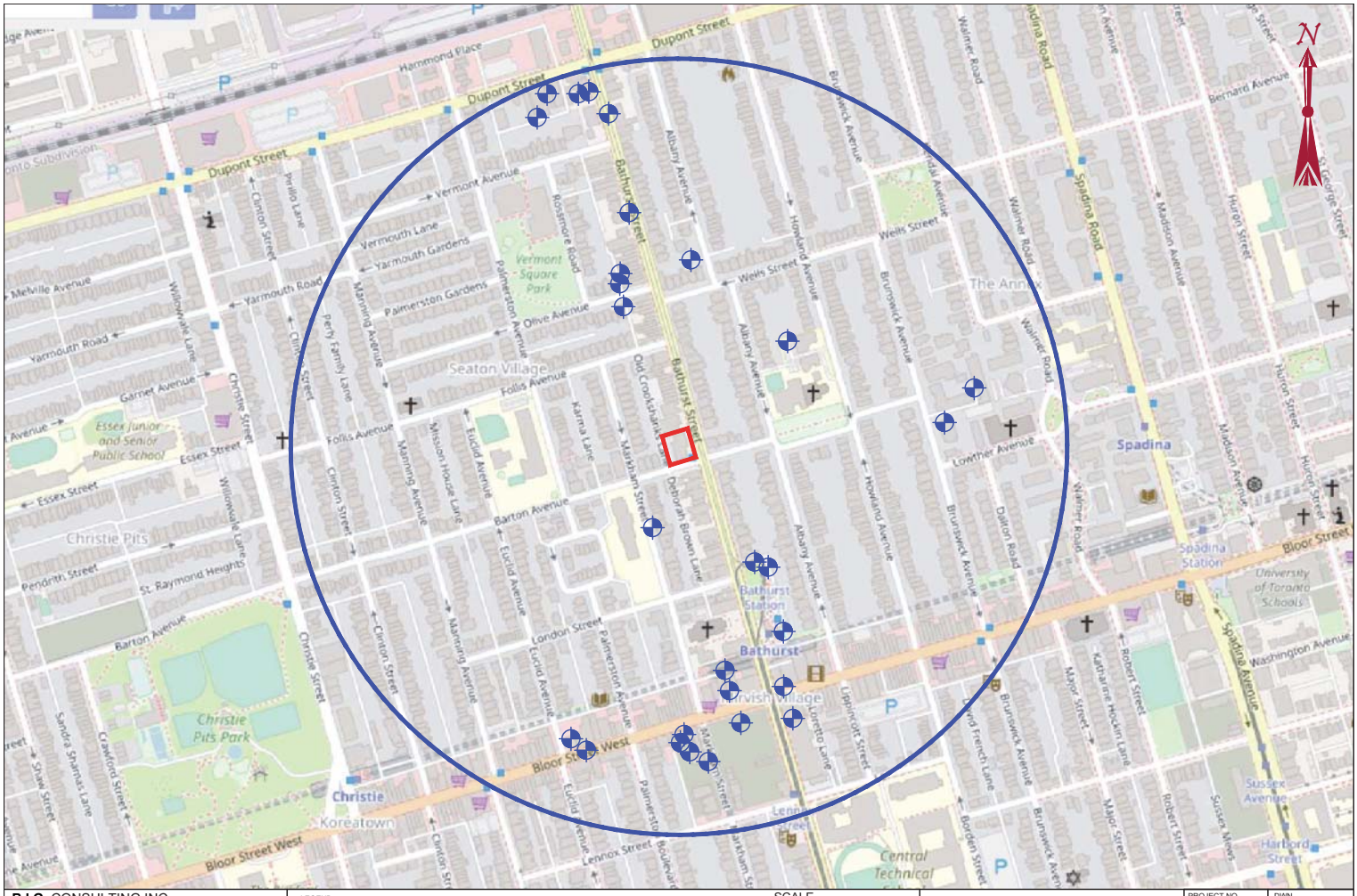
100m 0m 100m 200m 300m 400m 500m

NOTES:
1. SURFICIAL GEOLOGY PRODUCED BY MINISTRY OF ENERGY, NORTHERN DEVELOPMENT AND MINES, 2012
2. IMAGERY OBTAINED FROM OPENSTREETMAP, 2016

TITLE AND LOCATION

SURFICIAL GEOLOGY OF SOUTHERN ONTARIO
PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	3



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

- SITE BOUNDARY
- WELL RECORD STUDY AREA BOUNDARY
- WELL RECORD LOCATION (2022)

SCALE

50m 0m 250m

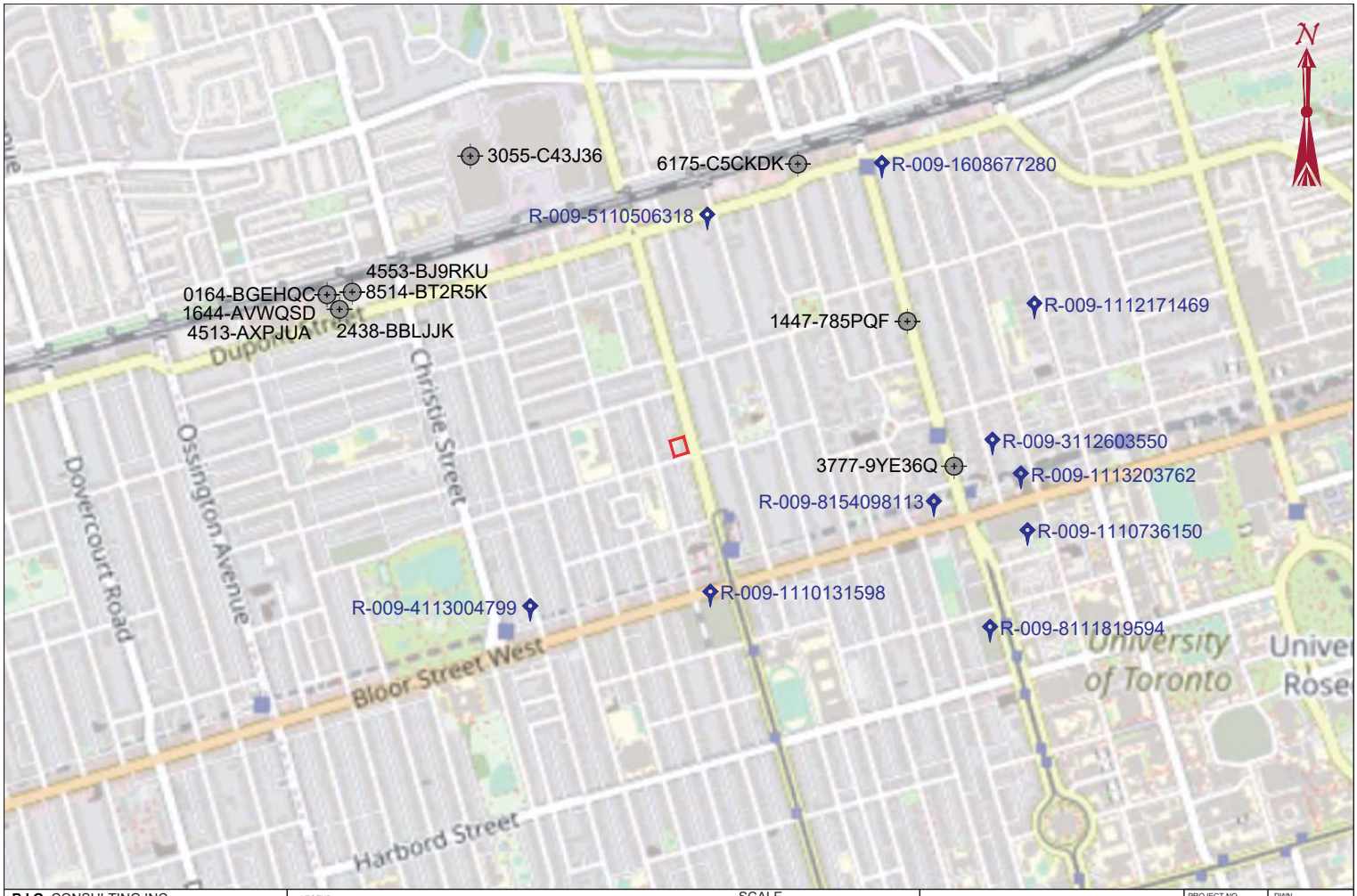
IMAGERY OBTAINED FROM OPENSTREETMAP, 2016

TITLE AND LOCATION

MECP WATER WELL RECORD LOCATIONS

PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	4



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

- SITE BOUNDARY
- LOCATION OF PTTW RECORD
- LOCATION OF EASR RECORD

SCALE

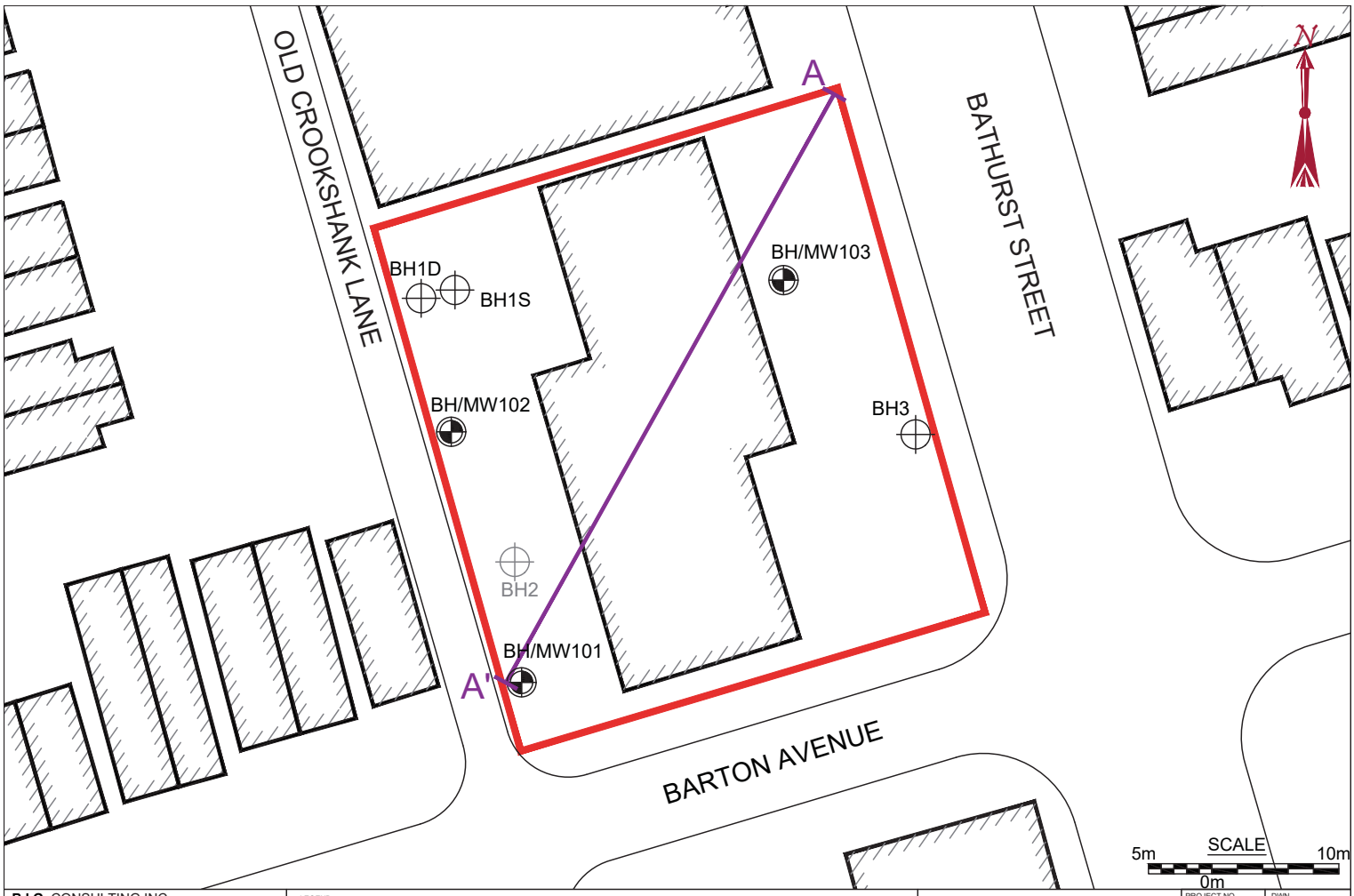
100m 0m 100m 200m 300m 400m 500m

IMAGERY OBTAINED FROM OPENSTREETMAP, 2016

TITLE AND LOCATION

PTTW AND EASR RECORD LOCATIONS
PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	5



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

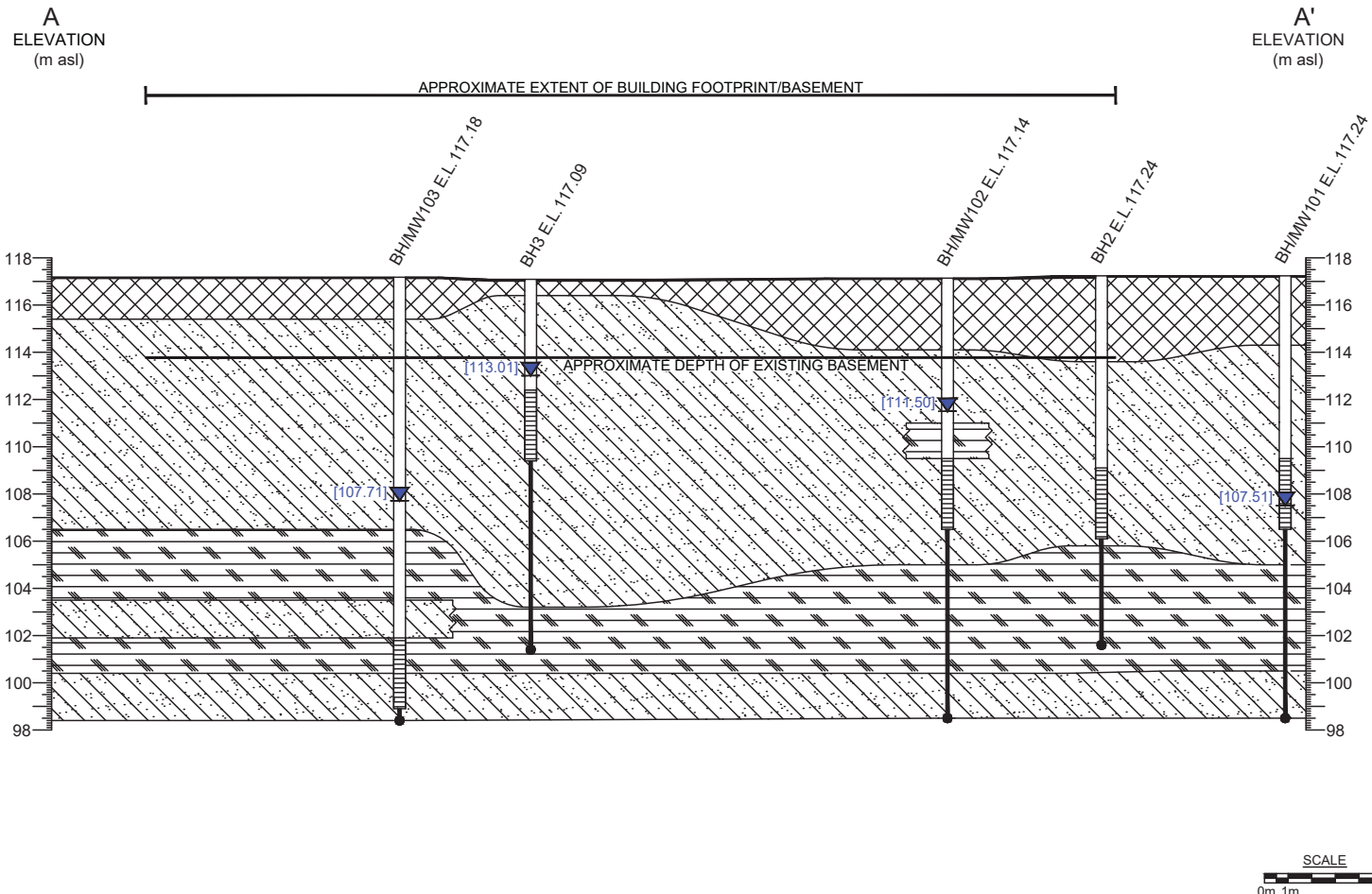
LEGEND

- SITE BOUNDARY
- BUILDING FOOTPRINT
- LOCATION OF BOREHOLE/MONITORING WELL (BIG, 2022)
- LOCATION OF BOREHOLE/MONITORING WELL (EXP, 2017)
- DESTROYED MONITORING WELL
- A A' GEOLOGICAL CROSS SECTION (SEE FIGURE 7)

TITLE AND LOCATION

BOREHOLE/MONITORING WELL LOCATION PLAN
PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	6



SCALE
0m 1m 5m

B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

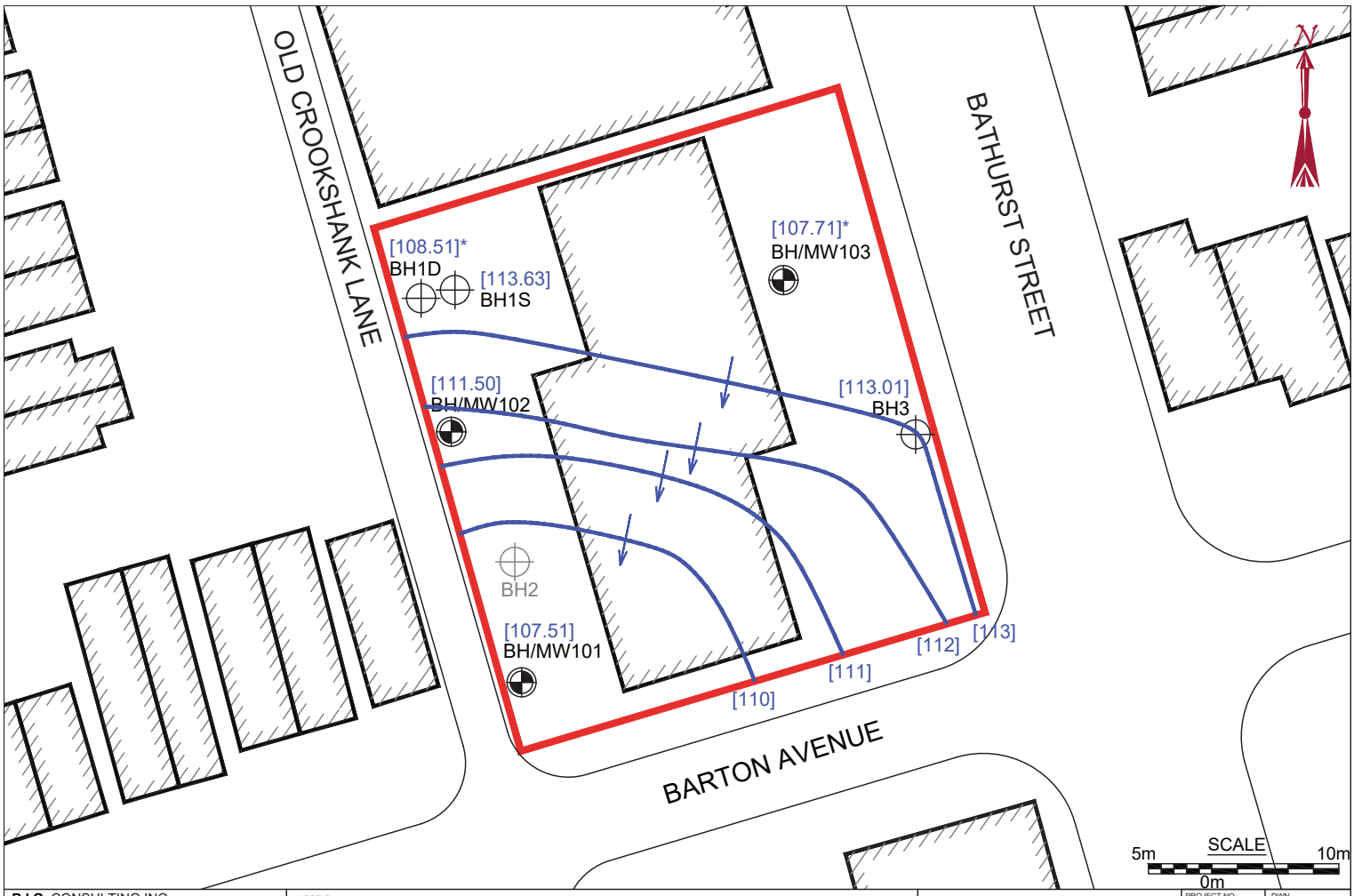
LEGEND

- ASPHALT / GRANULAR
- FILL
- SAND / SILTY SAND / SANDY SILT TILL
- SILTY CLAY / CLAYEY SILT TILL
- WATER LEVEL
- [xx.xx] WATER LEVEL MEASUREMENT (APRIL 01, 2022) (m asl)

TITLE AND LOCATION

GEOLOGICAL CROSS SECTION A-A'
PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	7



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

- SITE BOUNDARY
- BUILDING FOOTPRINT
- LOCATION OF BOREHOLE/MONITORING WELL (BIG, 2022)
- LOCATION OF BOREHOLE/MONITORING WELL (EXP, 2017)
- DESTROYED MONITORING WELL
- [XX.XX] WATER LEVEL MEASUREMENT (APRIL 01, 2022) (m asl)
- GROUNDWATER CONTOUR
- INTERPRETED DIRECTION OF GROUNDWATER FLOW
- * DEEP GROUNDWATER

TITLE AND LOCATION

INTERPRETED GROUNDWATER CONTOUR MAP PRELIMINARY HYDROGEOLOGICAL INVESTIGATION

914 BATHURST STREET, TORONTO, ONTARIO

PROJECT NO.	DWN.
BIGC-ENV-520A	O.A.
SCALE	CK.
AS NOTED	T.D.
DATE	FIG NO.
APRIL 2022	8

APPENDIX A: BOREHOLE LOGS

RECORD OF BOREHOLE No. BH/MW101

Project Number:	BIGC-ENV-520A	Drilling Location:	See BH Location Plan	Logged by:	KK
Project Client:	Sttaford Homes Limited	Drilling Method:	SSA+HSA	Compiled by:	KK
Project Name:	Geotechnical Investigation	Drilling Machine:	Truck Mounted Drill Rig	Reviewed by:	SS
Project Location:	914 Bathurst Street, Toronto, Ontario	Date Started:	22 Mar 21	Date Completed: 22 Mar 22	Revision No.: 0, 22-4-14

Geodetic Ground Surface Elevation: 117.24 m

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value/RQD%	DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS
	ASPHALT PAVEMENT: 50 mm asphalt over 150 mm granular base (117.14 / 0.7)					0	117				
	FILL: silty sand, trace to some gravel, occasional brick fragments, brown, moist, compact to dense	SS	1	67	12				11		
		SS	2	67	32	1	116		13		
	- auger grinding, very loose	SS	3	16	3				12		
						2	115				
		SS	4	59	17				11		
	(114.19)					3					
	SILTY SAND TILL: trace to some clay, trace to some gravel, light brown, moist, dense to very dense (3.1)	SS	5	100	50		114		10		
						4	113				
	------ grey	SS	6	100	50/13cm			50 / 13cm	18		
						5	112				
		SS	7	100	50/13cm		111	50 / 13cm	15		
						7	110				
		SS	8	100	50/13cm			50 / 13cm	14		
						8	109				
	- wet sand seam	SS	9	109	50/10cm	9	108	50 / 10cm	13		Gr: 11%, Sa: 62%, Si: 22%, Cl: 4%
						10					

FIELD TESTING: Penetration Testing — ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80

LAB TESTING: ★ Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL) W_P W W_L; Plastic Liquid 20 40 60 80

B.I.G. Consulting Inc.
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada
T: 416-214-4880
F: 416-551-2633

▽ No freestanding groundwater measured in open borehole on completion of drilling.

▼ Groundwater depth observed on 2022-04-01 at a depth of: 9.73 m.

Scale: 1 : 53

Continued on Next Page

RECORD OF BOREHOLE No. BH/MW101

Project Number: **BIGC-ENV-520A** Drilling Location: **See BH Location Plan** Logged by: **KK**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value/RQD%	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL) W_P W W_L Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	SILTY SAND TILL: trace to some clay, trace to some gravel, light brown, moist, dense to very dense					0	107				
		SS	10		50/3cm			50 3cm			
						11	106				
	105.05					12					
	SILTY CLAY/ CLAYEY SILT TILL: trace sand, trace gravel, grey, moist, hard 12.2	SS	11	100	52		105		18		Gr: 0%, Sa: 7%, Si: 55%, Cl: 38%
						13	104				
		SS	12	100	50				14		
						14	103				
						15					
		SS	13	100	50/13cm		102	50 13cm	19		
						16					
	100.48						101				
	SAND: coarse grained, trace gravel, grey, wet, dense 16.8	SS	14	100	50	17			18		
							100				
						18					
		SS	15	88	42		99		17		
	98.37										
	End of Borehole 18.9										

Notes:
1. Borehole was open to 18.87 m bgs upon completion of drilling.
2. Groundwater level not measured upon completion of drilling due to introduced drilling water.
3. Groundwater level reading at 9.73 m bgs on April 1, 2022.

Scale: 1 : 53

RECORD OF BOREHOLE No. BH/MW102

Project Number:	BIGC-ENV-520A	Drilling Location:	See BH Location Plan	Logged by:	KK
Project Client:	Sttaford Homes Limited	Drilling Method:	SSA+HSA	Compiled by:	KK
Project Name:	Geotechnical Investigation	Drilling Machine:	Track Mounted Drill Rig	Reviewed by:	SS
Project Location:	914 Bathurst Street, Toronto, Ontario	Date Started:	22 Mar 22	Date Completed: 22 Mar 24	Revision No.: 0, 22-4-14

Geodetic Ground Surface Elevation: 117.14 m

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value/RQD%	DEPTH (m)	ELEVATION (m)	FIELD TESTING: Penetration Testing (SPT ○ / DCPT ●); MTO Vane* (Intact △ / Remould ▲); Nilcon Vane* (Intact ◇ / Remould ◆); * Undrained Shear Strength (kPa) 20 40 60 80	LAB TESTING: ★ Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL) W_P W W_L; Plastic / Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	ASPHALT PAVEMENT: 50 mm asphalt over 150 mm granular base (0.7)						117.04				
	FILL: silty sand, trace to some clay, trace to some gravel, occasional brick fragments, brown, moist, loose to very loose	SS	1	87	9				9		
		SS	2	59	3	1	116		13		
		SS	3	25	2	2	115		15		
		AU									
	(114.09)					3	114				
	SILTY SAND TILL: trace clay, trace gravel, grey, moist to wet, very dense (3.1)	SS	4	84	61				15		
		SS	5	83	91	4	113		17		
	(111.04)					5	112				
	SILTY CLAY/ CLAYEY SILT TILL: trace sand, trace gravel, grey, moist, hard (6.1)	SS	6	100	84	6	111		12		
	(109.52)					7	110				
	SANDY SILT: trace gravel, grey, wet, very dense (7.6)	SS	7	92	66	8	109		13		
		SS	8	100	92	9	108		12		Gr: 2%, Sa: 27%, Si: 71%
						10					

Continued on Next Page

B.I.G. Consulting Inc.
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada
T: 416-214-4880
F: 416-551-2633

▽ No freestanding groundwater measured in open borehole on completion of drilling.

▼ Groundwater depth observed on 2022-04-01 at a depth of: 5.64 m.

Scale: 1 : 53

RECORD OF BOREHOLE No. BH/MW102

Project Number: **BIGC-ENV-520A** Drilling Location: **See BH Location Plan** Logged by: **KK**

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value/RQD%	DEPTH (m)	ELEVATION (m)	FIELD TESTING: Penetration Testing (○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80)	LAB TESTING: ★ Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL) W_P W W_L Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	SANDY SILT: trace gravel, grey, wet, very dense 106.47						107				
	SAND: coarse grained, some silt, trace gravel, grey, wet, dense 104.95	SS	9	100	50	11	106	○	○ 18		Gr: 1%, Sa: 84%, Si: 16%
	CLAYEY SILT TILL: trace sand, trace gravel, moist, hard 100.38	SS	10	100	88	12	105	○	○ 12		
		SS	11	100	90	13	104	○	○ 13		
		SS	12	100	95	14	103	○	○ 16		
	SAND: coarse grained, trace gravel, grey, wet, very dense 98.54	SS	13	100	86	15	102	○	○ 19		
		SS	14	100	50	16	101	○	○ 12		
	End of Borehole 18.6 Notes: 1. Borehole was open to 18.60 m bgs upon completion of drilling. 2. Groundwater level not measured upon completion of drilling due to introduced drilling water. 3. Groundwater level reading at 5.64 m bgs on April 1, 2022.					17	100				
						18	99				

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

Scale: 1 : 53

RECORD OF BOREHOLE No. BH/MW103

Project Number:	BIGC-ENV-520A	Drilling Location:	See BH Location Plan	Logged by:	KK
Project Client:	Sttaford Homes Limited	Drilling Method:	SSA+HSA	Compiled by:	KK
Project Name:	Geotechnical Investigation	Drilling Machine:	Track Mounted Drill Rig	Reviewed by:	SS
Project Location:	914 Bathurst Street, Toronto, Ontario	Date Started:	22 Mar 24	Date Completed: 22 Mar 25	Revision No.: 0, 22-4-14

Geodetic Ground Surface Elevation: 117.18 m

ASPHALT PAVEMENT: 50 mm asphalt over 150 mm granular base (117.08 / 0.1)

FILL: silty sand, trace clay, trace gravel, brown, moist, loose to dense

115.35

SILTY SAND/ SANDY SILT TILL: trace clay, trace gravel, light brown, moist, dense to very dense (1.8)

------

grey

Sample Type	Sample Number	Recovery (%)	SPT 'N' Value/RQD%	DEPTH (m)	ELEVATION (m)	FIELD TESTING: Penetration Testing (SPT / DCPT)	LAB TESTING: Soil Vapour Reading (ppm)
SS	1	70	5	0	117		18
SS	2	51	6	1	116		12
SS	3	100	46	2	115		13
SS	4	100	76	3	114		14
SS	5	100	50/13cm	4	113	50 / 13cm	11
SS	6	100	50/8cm	5	112	50 / 8cm	10
SS	7	100	50/13cm	6	111	50 / 13cm	13
SS	8	100	50/13cm	7	110	50 / 13cm	12
SS	9	100	50/8cm	8	109	50 / 8cm	15
				9	108		
				10			

FIELD TESTING: * Undrained Shear Strength (kPa) 20 40 60 80

LAB TESTING: ★ Rinse pH Values 2 4 6 8 10 12; Lower Explosive Limit (LEL) W_P W W_L; Plastic Liquid; 20 40 60 80

INSTRUMENTATION INSTALLATION

COMMENTS

B.I.G. Consulting Inc.
12-5500 Tomken Rd.
Mississauga, ON L4W 2Z4
Canada
T: 416-214-4880
F: 416-551-2633

▽ No freestanding groundwater measured in open borehole on completion of drilling.

▼ Groundwater depth observed on 2022-04-01 at a depth of: 9.47 m.

Scale: 1 : 53

Continued on Next Page

RECORD OF BOREHOLE No. BH/MW103

Project Number: **BIGC-ENV-520A** Drilling Location: **See BH Location Plan** Logged by: **KK**

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value/RQD%	DEPTH (m)	ELEVATION (m)	FIELD TESTING: Penetration Testing (SPT / DCPT), MTO Vane* (Intact / Remould), Nilcon Vane* (Intact / Remould), * Undrained Shear Strength (kPa)	LAB TESTING: Rinse pH Values, Soil Vapour Reading (parts per million (ppm)), Lower Explosive Limit (LEL), Plastic / Liquid	INSTRUMENTATION INSTALLATION	COMMENTS
	SILTY SAND/ SANDY SILT TILL: trace clay, trace gravel, light brown, moist, dense to very dense					10	107				
	106.51										
	SILTY CLAY/ CLAYEY SILT TILL: trace sand, trace gravel, grey, moist, hard 10.7	SS	10	100	83/28cm	11	106	83 / 28cm	17		Gr: 0%, Sa: 10%, Si: 48%, Cl: 42%
						12	105				
		SS	11	100	91				12		
	103.46					13	104				
	SANDY SILT: grey, wet, very dense 13.7	SS	12	100	50/10cm			50 / 10cm	18		
	101.94					14	103				
	SILTY CLAY/ CLAYEY SILT TILL: trace sand, trace gravel, grey, moist, hard 15.2	SS	13	100	96	15	102		14		
	100.42										
	SILTY SAND TILL: trace clay, trace gravel, grey, very moist, very dense 16.8	SS	14	100	88	16	101		15		
						17	100				
		SS	15	100	93	18	99		13		
	98.43										
	End of Borehole 18.8										

Notes:
1. Borehole was open to 18.75 m bgs upon completion of drilling.
2. Groundwater level not measured upon completion of drilling due to introduced drilling water.
3. Groundwater level reading at 9.47 m bgs on April 1, 2022.

Scale: 1 : 53

Log of Borehole 1D

Project No. BRM-00239841-A0-C
Drawing No. 2
Project: Preliminary Geotechnical Investigatio and Hydrogeological Study
Sheet No. 1 of 1
Location: 914 Bathurst Street, Toronto, Ontario

Date Drilled: June 20, 2017
Drill Type: Hollow Stem Augers
Datum: Geodetic

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

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
~125 mm **ASPHALT** over **FILL** - sand and gravel, some brick fragments, brown, moist	117.33	0	12, 13			
		1				
		2	5, 13			
SANDY SILT - trace silt seams and sand pockets, trace clay, brown to ~3.3 m depth, grey below, moist, very dense	~114.3	3	57			
		4	50/75 mm			
		5				
- becoming wet below ~6.1 m depth		6	67			
		7				
		8	77			22.6
		9	50/100 mm			23.0
CLAYEY SILT - grey, moist, very dense	~107.3	10				
		11	63			21.3
SILT to SANDY SILT - occasional wet sand pockets, trace clay, grey, moist to wet, very dense	~105.8	12	75			21.3
		13				
		14	50/75 mm			
		15	92/250 mm			22.7
End of Borehole	~101.7					

Notes:
1. Borehole advanced to completion at ~15.7 m depth by conventional soil sampling methods using a specialist drilling subcontractor. For borehole definitions, see notes prior to logs.
2. This drawing forms part of and must be read in conjunction with the subject report (Ref. No.: BRM-00239841-A0-C); borehole data requires interpretation assistance by exp professional staff before use by others.

exp.
Brampton

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	~14.8	~14.9
June 26, 2017	~7.7	Well

LAGWGL02EXP 239841A_BH_LOGS.GPJ NEW.GDT 6/29/17

Log of Borehole 1S

Project No. BRM-00239841-A0-C

Drawing No. 3

Project: Preliminary Geotechnical Investigatio and Hydrogeological Study

Sheet No. 1 of 1

Location: 914 Bathurst Street, Toronto, Ontario

Date Drilled: June 20, 2017

Drill Type: Hollow Stem Augers

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength kPa 100 200	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		See Log of Borehole 1D for Details	117.36	0 1 2 3 4 5 6 7 8 9				
		End of Borehole	~108.2					

Notes:
1. Borehole advanced to completion at ~9.2 m depth by conventional soil sampling methods using a specialist drilling subcontractor. For borehole definitions, see notes prior to logs.
2. This drawing forms part of and must be read in conjunction with the subject report (Ref. No.: BRM-00239841-A0-C); borehole data requires interpretation assistance by exp professional staff before use by others.

exp.
Brampton

Elapsed Time	Water Level (m)	Hole Open to (m)
June 26, 2017	~3.5	Well

LAGWGL02EXP 239841A_BH_LOGS.GPJ NEW.GDT 6/29/17

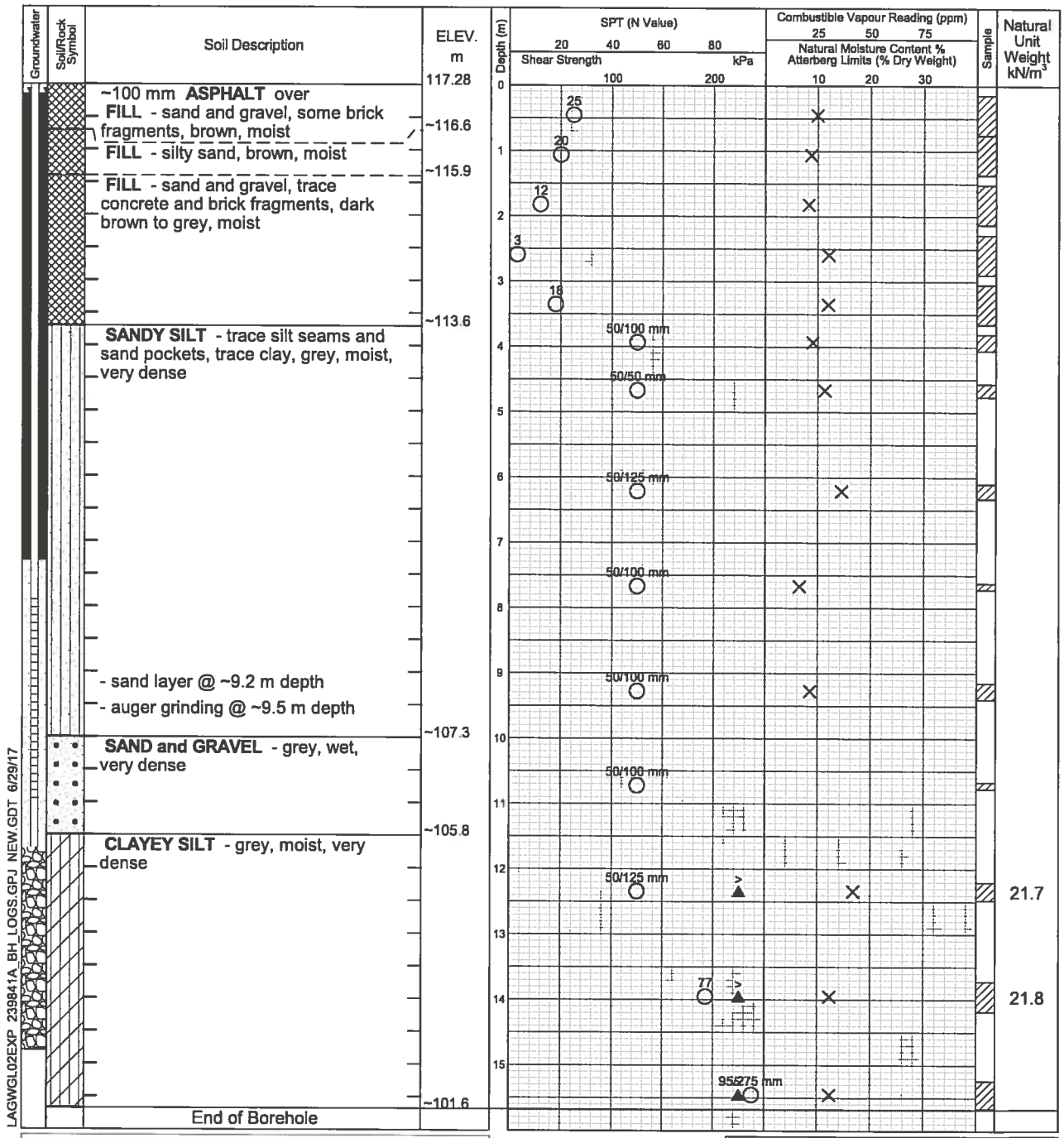
Log of Borehole 2

Project No. BRM-00239841-A0-C
Drawing No. 4
Project: Preliminary Geotechnical Investigatio and Hydrogeological Study
Sheet No. 1 of 1
Location: 914 Bathurst Street, Toronto, Ontario

Date Drilled: June 19, 2017
Drill Type: Hollow Stem Augers
Datum: Geodetic

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



LAGWGL02EXP 239841A BH_LOGS.GPJ NEW.GDT 6/29/17

Notes:
1. Borehole advanced to completion at ~15.7 m depth by conventional soil sampling methods using a specialist drilling subcontractor. For borehole definitions, see notes prior to logs.
2. This drawing forms part of and must be read in conjunction with the subject report (Ref. No.: BRM-00239841-A0-C); borehole data requires interpretation assistance by exp professional staff before use by others.

exp.
Brampton

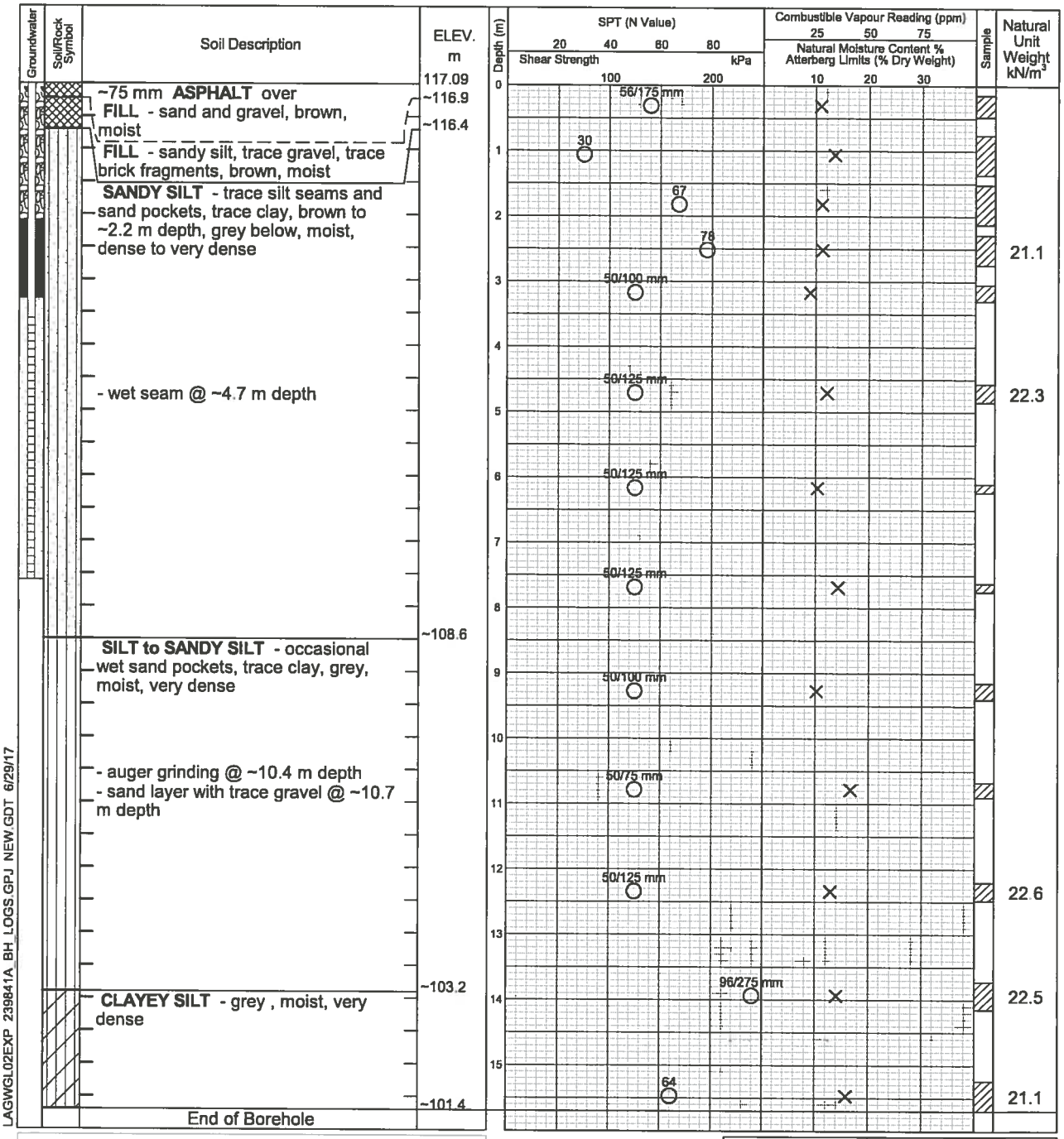
Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	~14.5	~14.8
June 26, 2017	~9.5	Well

Log of Borehole 3

Project No. BRM-00239841-A0-C
Drawing No. 5
Project: Preliminary Geotechnical Investigatio and Hydrogeological Study
Sheet No. 1 of 1
Location: 914 Bathurst Street, Toronto, Ontario

Date Drilled: June 20, 2017
Drill Type: Hollow Stem Augers
Datum: Geodetic

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



LAGWGL02EXP 239841A BH_LOGS.GPJ NEW.GDT 6/29/17

Notes:
1. Borehole advanced to completion at ~15.7 m depth by conventional soil sampling methods using a specialist drilling subcontractor. For borehole definitions, see notes prior to logs.
2. This drawing forms part of and must be read in conjunction with the subject report (Ref. No.: BRM-00239841-A0-C); borehole data requires interpretation assistance by exp professional staff before use by others.

exp.
Brampton

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	~7.3	~7.6
June 26, 2017	~3.8	Well

APPENDIX B: MECP WWR, PTTW AND EASR SUMMARY TABLES

Table B-1: MECP WWR Summary Table

Count	Well ID	Date Completed	Depth (m)	Reported Water Level (m)	Status of Well
1.	6928105	08/09/2004	7.6	N/A	Test Hole
2.	6929484	09/22/2005	5.7	4	Test Hole
3.	6929678	10/18/2005	1.4	3.5	Observation
4.	6929779	08/27/2004	7.6	N/A	Observation
5.	7038485	09/28/2006	4.6	N/A	Observation
6.	7039530	12/20/2006	3.8	N/A	Observation
7.	7051507	10/16/2007	6.1	N/A	Observation
8.	7052396	10/15/2007	5.2	N/A	Observation
9.	7113533	09/26/2008	6	1.53	Observation
10.	7135516	11/20/2009	N/A	10	Abandoned
11.	7188787	06/29/2012	N/A	N/A	N/A
12.	7205614	06/17/2013	7.6	4	Observation
13.	7205615	06/14/2013	16.6	4	Observation
14.	7205616	06/13/2013	8.2	4	Observation
15.	7205619	06/18/2013	17.4	4	Observation
16.	7215990	12/19/2013	3.4	N/A	Observation
17.	7215991	12/19/2013	3.4	N/A	Monitoring and Test Hole
18.	7217203	02/26/2014	6	N/A	Observation
19.	7217204	02/26/2014	6	N/A	Observation
20.	7217576	02/26/2014	4.6	4.6	Observation
21.	7222385	06/18/2014	N/A	N/A	N/A
22.	7229255	08/28/2014	N/A	N/A	N/A
23.	7248163	06/30/2015	15.2	N/A	Observation
24.	7259710	10/20/2015	N/A	N/A	N/A
25.	7260711	09/18/2015	6.1	4.6	Test Hole
26.	7265239	05/18/2016	4.6	N/A	Monitoring and Test Hole
27.	7267290	05/16/2012	N/A	N/A	N/A
28.	7272411	08/25/2016	24.4	9.1	Test Hole
29.	7273448	08/31/2016	1.8	N/A	Monitoring and Test Hole
30.	7273449	08/31/2016	1.5	N/A	Monitoring and Test Hole
31.	7280101	12/02/2016	7.3	N/A	Monitoring and Test Hole
32.	7280102	12/02/2016	6.7	N/A	Monitoring and Test Hole
33.	7284719	03/20/2017	4.3	N/A	Monitoring and Test Hole
34.	7289945	05/17/2017	6.1	N/A	Observation
35.	7292231	06/30/2017	N/A	N/A	N/A
36.	7294263	01/10/2017	7	4.4	Test Hole
37.	7296687	09/01/2017	4.6	N/A	Monitoring and Test Hole
38.	7325875	10/31/2018	24.4	5.1	Monitoring and Test Hole
39.	7332336	01/10/2019	7.6	6.1	Monitoring and Test Hole
40.	7332337	01/10/2019	7.6	N/A	Monitoring and Test Hole
41.	7346697	N/A	7.6	N/A	Observation
42.	7352996	12/12/2019	11.9	N/A	Observation
43.	7353164	12/13/2019	16.5	N/A	Observation

Count	Well ID	Date Completed	Depth (m)	Reported Water Level (m)	Status of Well
44.	7353179	12/11/2019	12.7	7.5	Observation
45.	7354567	02/10/2020	7	N/A	Observation
46.	7354590	02/11/2020	15.1	N/A	Observation
47.	7362939	06/24/2020	3.1	2.7	Observation
48.	7362940	06/24/2020	3.1	2.3	Observation
49.	7364678	04/03/2020	N/A	N/A	N/A
50.	7364679	04/03/2020	N/A	N/A	N/A
51.	7364680	04/03/2020	N/A	N/A	N/A
52.	7364681	04/03/2020	N/A	N/A	N/A
53.	7369718	09/09/2020	N/A	N/A	N/A
54.	7369719	09/09/2020	N/A	N/A	N/A
55.	7369720	09/29/2020	N/A	N/A	N/A
56.	7373526	10/16/2020	N/A	N/A	N/A
57.	7376447	12/21/2020	7.6	6	Observation
58.	7376448	12/21/2020	6.4	5.1	Observation
59.	7376449	12/21/2020	6.4	5.1	Observation

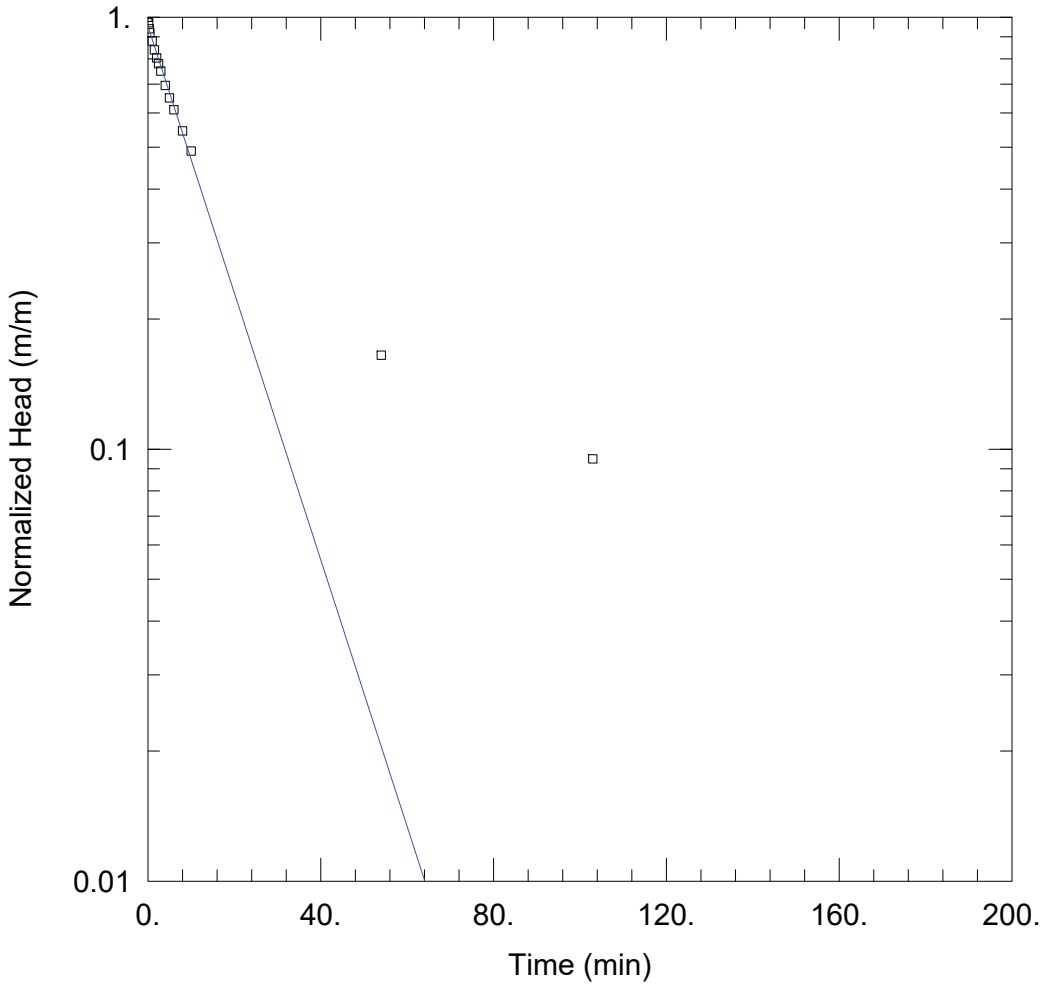
Table B-2: MECP PTTW and EASR Summary Table

Permit Number	Purpose	Address	Municipality	Water Source	Max L/Day	Active
R-009-8111819594	Construction Dewatering	666 Spadina Avenue	Toronto	Groundwater	50,000 to 400,000	No
R-009-1110736150	Construction Dewatering	371 Bloor Street West	Toronto	Groundwater	50,000 to 400,000	No
R-009-1113203762	Construction Dewatering	300 Bloor Street West	Toronto	Groundwater	50,000 to 400,000	Yes
R-009-4113004799	Construction Dewatering	5 Christie Street	Toronto	Groundwater	50,000 to 400,000	Yes
R-009-1608677280	Construction Dewatering	263 Dupont Street	Toronto	Groundwater	50,000 to 400,000	No
R-009-1110131598	Construction Dewatering	581 Bloor Street West	Toronto	Groundwater	50,000 to 400,000	No
R-009-1112171469	Construction Dewatering	226 St. George Street	Toronto	Groundwater	50,000 to 400,000	No
R-009-1112171469	Construction Dewatering	226 St. George Street	Toronto	Groundwater	57,600	Yes
R-009-5110506318	Construction Dewatering	420 Dupont Street	Toronto	Groundwater	50,000 to 400,000	No
R-009-1110131598	Construction Dewatering	581 Bloor Street West	Toronto	Groundwater	233,700	Yes
R-009-8154098113	Construction Dewatering	350 Bloor Street West	Toronto	Groundwater	184,200	Yes
R-009-3112603550	Construction Dewatering	11 Madison Avenue	Toronto	Groundwater	50,000 to 400,000	Yes

Permit Number	Purpose	Address	Municipality	Water Source	Max L/Day	Active
1447-785PQF	Construction Dewatering	88 Spadina Road	Toronto	Groundwater	500,000	No
2438-BBLJJK	Miscellaneous	Lot 27 and 28, Concession 2 from the Bay, York, Geographic Township of York Toronto	Toronto	Groundwater	56,016	No
0164-BGEHQC	Construction Dewatering	Lot 27 and 28, Concession 2 from the Bay, York Geographic Township of York Toronto	Toronto	Groundwater	1,687,680	No
4553-BJ9RKU	Construction Dewatering	Lot 27 and 28, Concession 2 from the Bay, York, 740 Dupont Street (740, 744, 746, 748 & 750 Dupont Street), Geographic Township of York Toronto	Toronto	Groundwater	1,687,680	No
8514-BT2R5K	Construction Dewatering	Lot 27 and 28, Concession 2 from the Bay, York, Geographic Township of York Toronto	Toronto	Groundwater	1,687,680	No
3055-C43J36	Construction Dewatering	500 Dupont Street	Toronto	Groundwater	930,000	Yes
6175-C5CKDK	Construction Dewatering	328 Dupont Street, Lot 24, Concession 2 from the Bay Toronto	Toronto	Groundwater	872,000	Yes
3777-9YE36Q	Construction Dewatering	7 Spadina Road	Toronto	Groundwater	100,800	No
2438-BBLJJK	Miscellaneous	Lot 27 and 28, Concession 2 from the Bay, York, Geographic Township of York Toronto	Toronto	Groundwater	56,016	Yes

Permit Number	Purpose	Address	Municipality	Water Source	Max L/Day	Active
1644-AVWQSD	Construction Dewatering	740 Dupont Street (740, 744, 746, 748 & 750 Dupont Street)	Toronto	Groundwater	1,687,680	No
4513-AXPJUA	Construction Dewatering	740 Dupont Street (740, 744, 746, 748 & 750 Dupont Street)	Toronto	Groundwater	1,687,680	No

APPENDIX C: SWRT RESULTS



WELL TEST ANALYSIS

Data Set: C:\...\BH1D.aqt
Date: 04/20/22 Time: 20:57:28

PROJECT INFORMATION

Company: B.I.G. Consulting Inc.
Client: Stafford Developments
Project: BIGC-ENV-520A
Location: 914 Bathurst St., Toronto, ON
Test Well: BH1D
Test Date: March 28, 2022

AQUIFER DATA

Saturated Thickness: 4.9 m Anisotropy Ratio (Kz/Kr): 1.

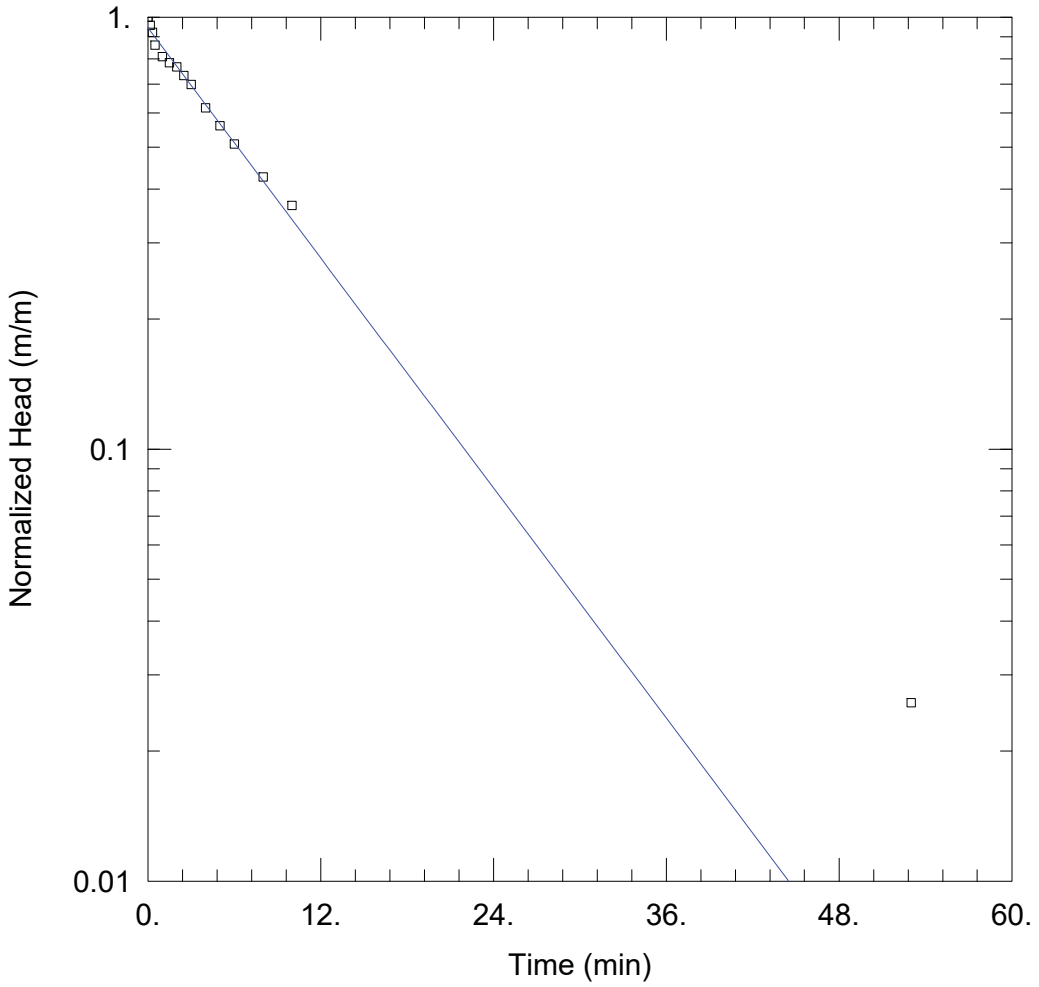
WELL DATA (BH1D)

Initial Displacement: 1. m
Total Well Penetration Depth: 4.9 m
Casing Radius: 0.025 m
Static Water Column Height: 4.9 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 6.766E-7 m/sec y0 = 0.9522 m



WELL TEST ANALYSIS

Data Set: C:\...\BH1S.aqt
Date: 04/20/22 Time: 21:12:33

PROJECT INFORMATION

Company: B.I.G. Consulting Inc.
Client: Stafford Developments
Project: BIGC-ENV-520A
Location: 914 Bathurst St., Toronto, ON
Test Well: BH1S
Test Date: March 28, 2022

AQUIFER DATA

Saturated Thickness: 6.83 m Anisotropy Ratio (Kz/Kr): 1.

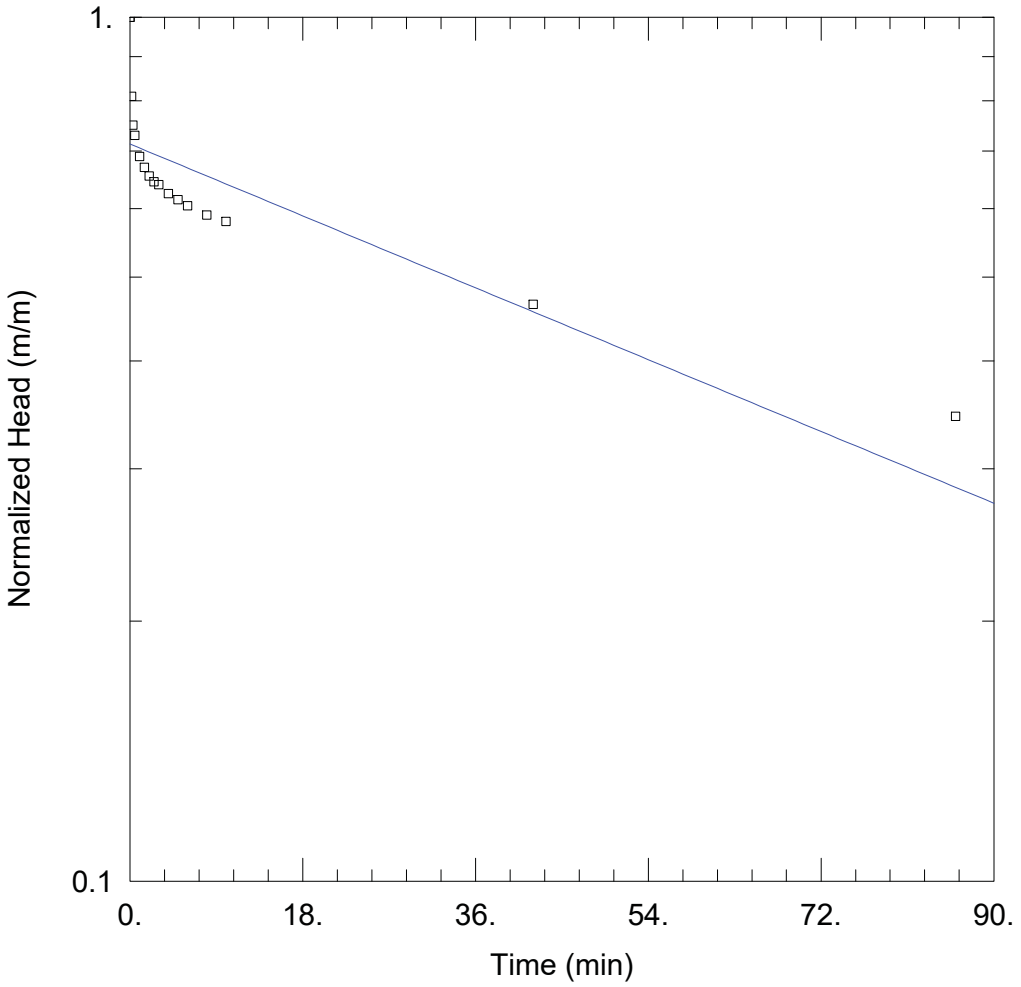
WELL DATA (BH1S)

Initial Displacement: 1.16 m
Total Well Penetration Depth: 6.83 m
Casing Radius: 0.025 m
Static Water Column Height: 6.83 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 9.726E-7 m/sec y0 = 1.096 m



WELL TEST ANALYSIS

Data Set: C:\...\BH3.aqt
Date: 04/20/22 Time: 21:11:18

PROJECT INFORMATION

Company: B.I.G. Consulting Inc.
Client: Stafford Developments
Project: BIGC-ENV-520A
Location: 914 Bathurst St., Toronto, ON
Test Well: BH3
Test Date: March 28, 2022

AQUIFER DATA

Saturated Thickness: 3.47 m Anisotropy Ratio (Kz/Kr): 1.

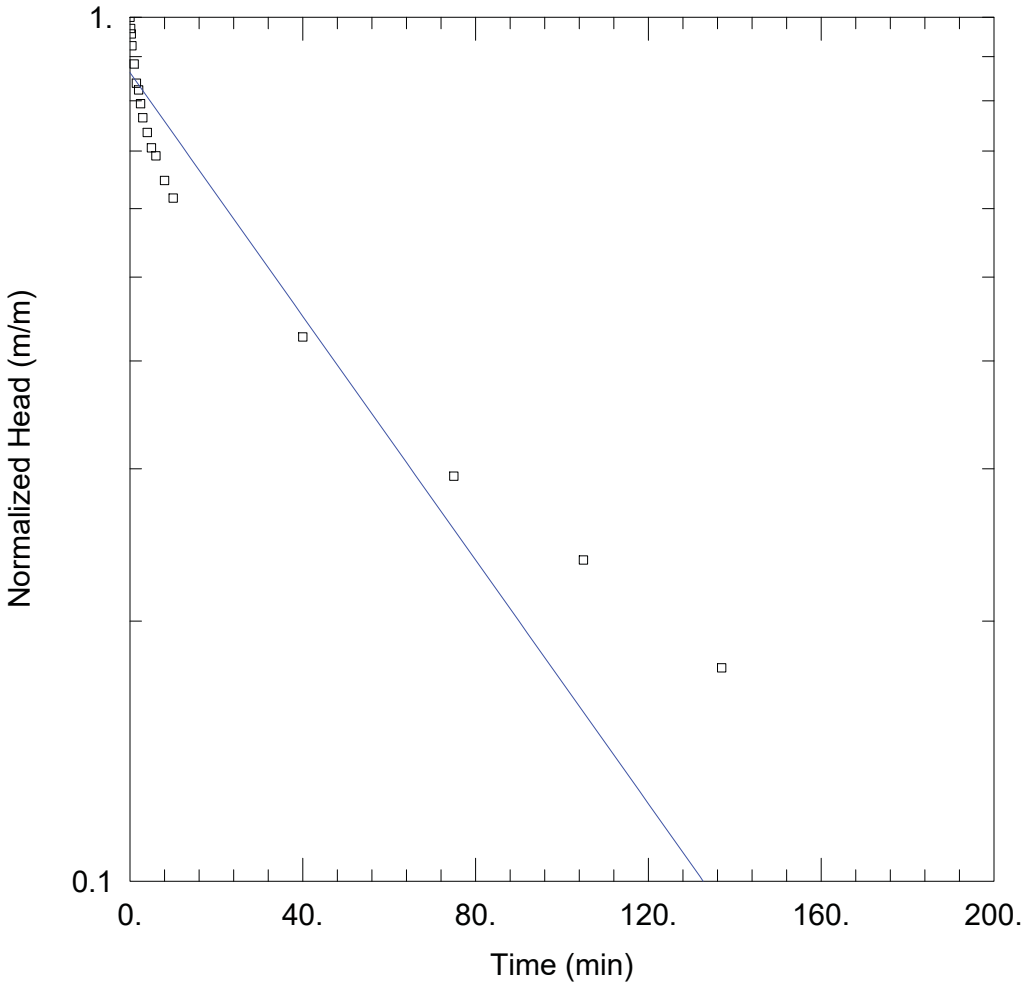
WELL DATA (BH3)

Initial Displacement: 1. m
Total Well Penetration Depth: 3.47 m
Casing Radius: 0.025 m
Static Water Column Height: 3.47 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.687E-7 m/sec y0 = 0.7131 m



WELL TEST ANALYSIS

Data Set: C:\...\MW101.aqt
Date: 04/20/22 Time: 21:13:33

PROJECT INFORMATION

Company: B.I.G. Consulting Inc.
Client: Stafford Developments
Project: BIGC-ENV-520A
Location: 914 Bathurst St., Toronto, ON
Test Well: BH/MW101
Test Date: March 28, 2022

AQUIFER DATA

Saturated Thickness: 0.82 m Anisotropy Ratio (Kz/Kr): 1.

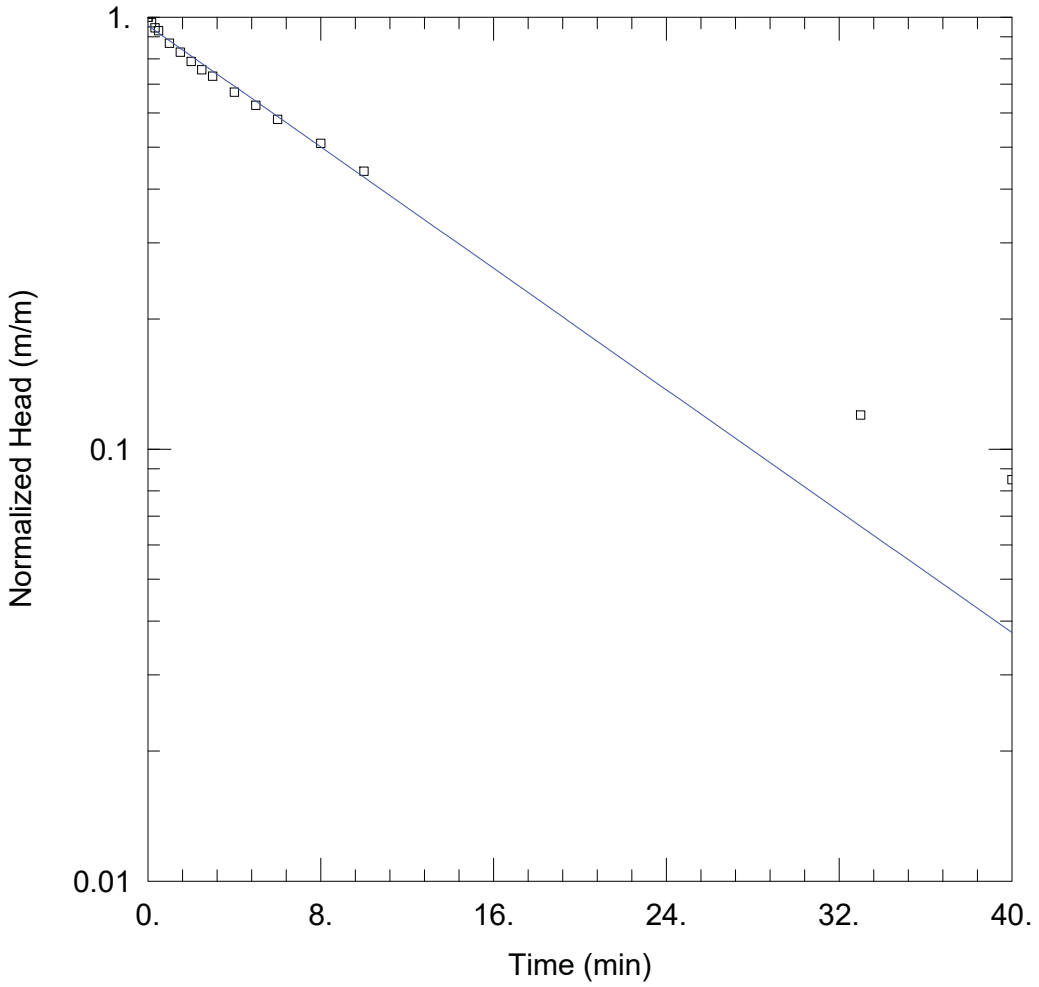
WELL DATA (BH/MW101)

Initial Displacement: 0.34 m
Total Well Penetration Depth: 0.82 m
Casing Radius: 0.025 m
Static Water Column Height: 0.82 m
Screen Length: 0.82 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 5.464E-7 m/sec y0 = 0.2932 m



WELL TEST ANALYSIS

Data Set: C:\...\MW102.aqt
Date: 04/20/22 Time: 21:14:30

PROJECT INFORMATION

Company: B.I.G. Consulting Inc.
Client: Stafford Developments
Project: BIGC-ENV-520A
Location: 914 Bathurst St., Toronto, ON
Test Well: BH/MW102
Test Date: March 28, 2022

AQUIFER DATA

Saturated Thickness: 4.75 m Anisotropy Ratio (Kz/Kr): 1.

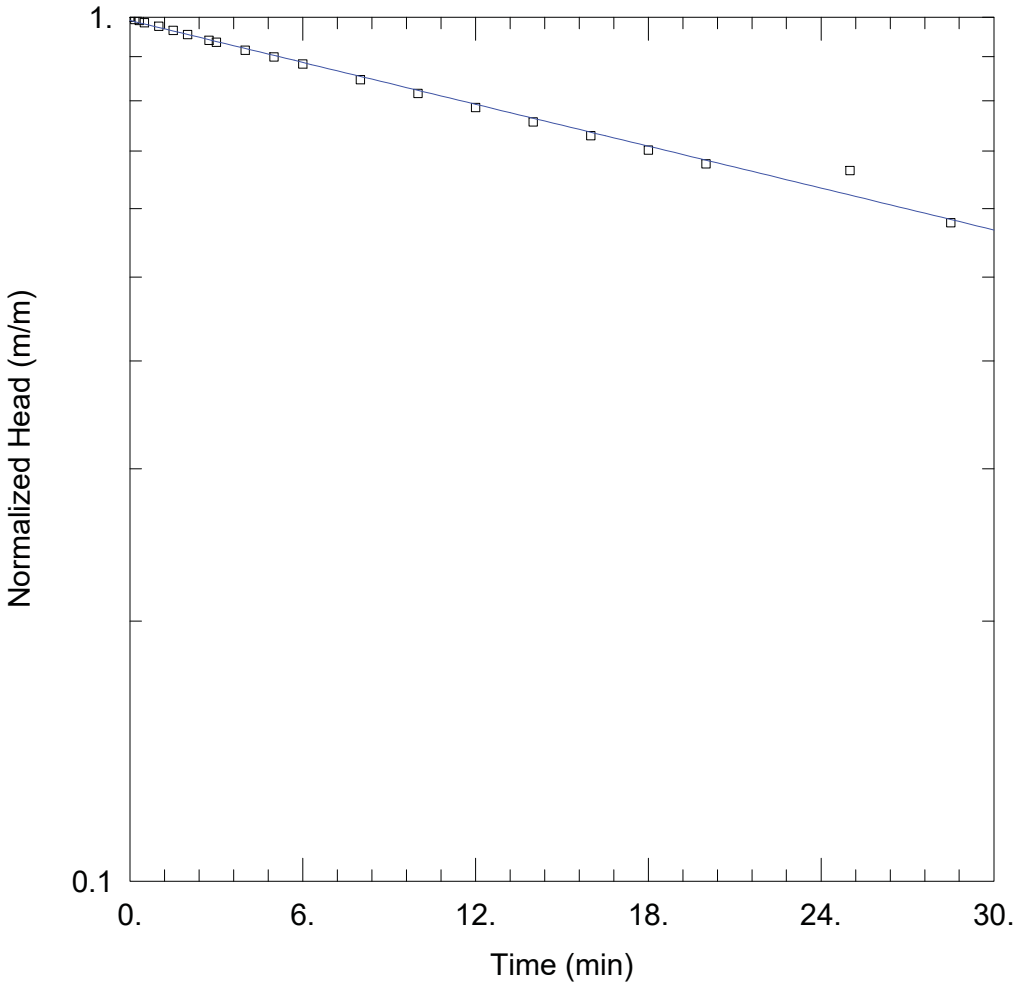
WELL DATA (BH/MW102)

Initial Displacement: 1. m
Total Well Penetration Depth: 4.75 m
Casing Radius: 0.025 m
Static Water Column Height: 4.75 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 7.693E-7 m/sec y0 = 0.956 m



WELL TEST ANALYSIS

Data Set: C:\...\MW103.aqt
Date: 04/20/22 Time: 21:06:48

PROJECT INFORMATION

Company: B.I.G. Consulting Inc.
Client: Stafford Developments
Project: BIGC-ENV-520A
Location: 914 Bathurst St., Toronto, ON
Test Well: BH/MW103
Test Date: March 28, 2022

AQUIFER DATA

Saturated Thickness: 8.99 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH/MW103)

Initial Displacement: 3.32 m
Total Well Penetration Depth: 8.99 m
Casing Radius: 0.025 m
Static Water Column Height: 8.99 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.77E-7 m/sec y0 = 3.29 m

APPENDIX D: WATER QUALITY LABORATORY CERTIFICATE OF ANALYSIS AND CHAIN OF CUSTODY

Your Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Your C.O.C. #: n/a

Attention: Eileen Liu

B.I.G Consulting Inc.
12-5500 Tomken Road
Mississauga, ON
CANADA L4W 2Z4

Report Date: 2022/04/06
Report #: R7075386
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C281305
Received: 2022/03/28, 18:45

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sewer Use By-Law Semivolatile Organics	1	2022/03/29	2022/03/30	CAM SOP 00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2022/03/29	2022/04/03	CAM SOP-00427	SM 23 5210B m
Chromium (VI) in Water	1	N/A	2022/03/30	CAM SOP-00436	EPA 7199 m
Total Cyanide	1	2022/03/30	2022/03/30	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2022/03/29	2022/03/31	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2022/03/29	2022/03/29	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2022/04/06	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2022/03/28	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2022/04/03	2022/04/05	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2022/04/03	2022/04/05	CAM SOP-00313	In-house Method
Animal and Vegetable Oil and Grease	1	N/A	2022/04/05	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2022/04/05	2022/04/05	CAM SOP-00326	EPA1664B m,SM5520B m
Polychlorinated Biphenyl in Water	1	2022/03/30	2022/03/31	CAM SOP-00309	EPA 8082A m
pH	1	2022/03/29	2022/03/31	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2022/03/29	CAM SOP-00444	OMOE E3179 m
Total Kjeldahl Nitrogen in Water	1	2022/04/01	2022/04/01	CAM SOP-00938	OMOE E3516 m
Total PAHs (1)	1	N/A	2022/03/31	CAM SOP - 00301	
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2022/04/05	2022/04/05	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2022/04/02	2022/04/04	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2022/03/31	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

Your Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Your C.O.C. #: n/a

Attention: Eileen Liu

B.I.G Consulting Inc.
12-5500 Tomken Road
Mississauga, ON
CANADA L4W 2Z4

Report Date: 2022/04/06
Report #: R7075386
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C281305
Received: 2022/03/28, 18:45

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.

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) Total PAHs include only those PAHs specified in the sewer use by-by-law.
(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.
Deepthi Shaji, Project Manager
Email: Deepthi.Shaji@bureauveritas.com
Phone# (905)817-5700 Ext:7065843
==========
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 Job #: C281305
Report Date: 2022/04/06

B.I.G Consulting Inc.
Client Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Sampler Initials: JR

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				SFC562			SFC562		
Sampling Date				2022/03/28 17:00			2022/03/28 17:00		
COC Number				n/a			n/a		
	UNITS	Criteria	Criteria-2	MW102	RDL	QC Batch	MW102 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	-	150	ND	0.50	7907602			
Inorganics									
Total BOD	mg/L	15	300	ND	2	7908901			
Fluoride (F-)	mg/L	-	10	0.22	0.10	7908448			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	0.80	0.10	7916428			
pH	pH	6.0:9.5	6.0:11.5	7.94		7908454			
Phenols-4AAP	mg/L	0.008	1.0	ND	0.0010	7909782			
Total Suspended Solids	mg/L	15	350	**47**	10	7916768			
Total Cyanide (CN)	mg/L	0.02	2	ND	0.0050	7912143			
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	ND	0.50	7922065			
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	ND	0.50	7922067			
Miscellaneous Parameters									
Nonylphenol Ethoxylate (Total)	mg/L	0.01	0.2	ND	0.005	7919419	ND	0.005	7919419
Nonylphenol (Total)	mg/L	0.001	0.02	ND	0.001	7919418	ND	0.001	7919418
Metals									
Chromium (VI)	ug/L	40	2000	ND	0.50	7911212			
Mercury (Hg)	mg/L	0.0004	0.01	ND	0.00010	7909260			
Total Aluminum (Al)	ug/L	-	50000	530	4.9	7922417			
Total Antimony (Sb)	ug/L	-	5000	ND	0.50	7922417			
Total Arsenic (As)	ug/L	20	1000	ND	1.0	7922417			
Total Cadmium (Cd)	ug/L	8	700	ND	0.090	7922417			
Total Chromium (Cr)	ug/L	80	4000	ND	5.0	7922417			
Total Cobalt (Co)	ug/L	-	5000	0.82	0.50	7922417			
Total Copper (Cu)	ug/L	40	2000	1.2	0.90	7922417			
Total Lead (Pb)	ug/L	120	1000	ND	0.50	7922417			
Total Manganese (Mn)	ug/L	50	5000	**140**	2.0	7922417			

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: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Bureau Veritas Job #: C281305
Report Date: 2022/04/06

B.I.G Consulting Inc.
Client Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Sampler Initials: JR

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				SFC562			SFC562		
Sampling Date				2022/03/28 17:00			2022/03/28 17:00		
COC Number				n/a			n/a		
	UNITS	Criteria	Criteria-2	MW102	RDL	QC Batch	MW102 Lab-Dup	RDL	QC Batch
Total Molybdenum (Mo)	ug/L	-	5000	11	0.50	7922417			
Total Nickel (Ni)	ug/L	80	2000	2.3	1.0	7922417			
Total Phosphorus (P)	ug/L	400	10000	110	100	7922417			
Total Selenium (Se)	ug/L	20	1000	ND	2.0	7922417			
Total Silver (Ag)	ug/L	120	5000	ND	0.090	7922417			
Total Tin (Sn)	ug/L	-	5000	1.2	1.0	7922417			
Total Titanium (Ti)	ug/L	-	5000	30	5.0	7922417			
Total Zinc (Zn)	ug/L	40	2000	ND	5.0	7922417			
Semivolatile Organics									
Di-N-butyl phthalate	ug/L	15	80	ND	2	7910198			
Bis(2-ethylhexyl)phthalate	ug/L	8.8	12	ND	2	7910198			
3,3'-Dichlorobenzidine	ug/L	0.8	2	ND	0.8	7910198			
Pentachlorophenol	ug/L	2	5	ND	1	7910198			
Phenanthrene	ug/L	-	-	ND	0.2	7910198			
Anthracene	ug/L	-	-	ND	0.2	7910198			
Fluoranthene	ug/L	-	-	ND	0.2	7910198			
Pyrene	ug/L	-	-	ND	0.2	7910198			
Benzo(a)anthracene	ug/L	-	-	ND	0.2	7910198			
Chrysene	ug/L	-	-	ND	0.2	7910198			
Benzo(b/j)fluoranthene	ug/L	-	-	ND	0.2	7910198			
Benzo(k)fluoranthene	ug/L	-	-	ND	0.2	7910198			
Benzo(a)pyrene	ug/L	-	-	ND	0.2	7910198			
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND	0.2	7910198			
Dibenzo(a,h)anthracene	ug/L	-	-	ND	0.2	7910198			
Benzo(g,h,i)perylene	ug/L	-	-	ND	0.2	7910198			
Dibenzo(a,i)pyrene	ug/L	-	-	ND	0.2	7910198			
Benzo(e)pyrene	ug/L	-	-	ND	0.2	7910198			
Perylene	ug/L	-	-	ND	0.2	7910198			

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: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Bureau Veritas Job #: C281305
Report Date: 2022/04/06

B.I.G Consulting Inc.
Client Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Sampler Initials: JR

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				SFC562			SFC562		
Sampling Date				2022/03/28 17:00			2022/03/28 17:00		
COC Number				n/a			n/a		
	UNITS	Criteria	Criteria-2	MW102	RDL	QC Batch	MW102 Lab-Dup	RDL	QC Batch
Dibenzo(a,j) acridine	ug/L	-	-	ND	0.4	7910198			
7H-Dibenzo(c,g) Carbazole	ug/L	-	-	ND	0.4	7910198			
1,6-Dinitropyrene	ug/L	-	-	ND	0.4	7910198			
1,3-Dinitropyrene	ug/L	-	-	ND	0.4	7910198			
1,8-Dinitropyrene	ug/L	-	-	ND	0.4	7910198			
Calculated Parameters									
Total PAHs (18 PAHs)	ug/L	2	5	ND	1	7908030			
Volatile Organics									
Benzene	ug/L	2	10	ND	0.40	7909156			
Chloroform	ug/L	2	40	ND	0.40	7909156			
1,2-Dichlorobenzene	ug/L	5.6	50	ND	0.80	7909156			
1,4-Dichlorobenzene	ug/L	6.8	80	ND	0.80	7909156			
cis-1,2-Dichloroethylene	ug/L	5.6	4000	ND	1.0	7909156			
trans-1,3-Dichloropropene	ug/L	5.6	140	ND	0.80	7909156			
Ethylbenzene	ug/L	2	160	ND	0.40	7909156			
Methylene Chloride(Dichloromethane)	ug/L	5.2	2000	ND	4.0	7909156			
1,1,2,2-Tetrachloroethane	ug/L	17	1400	ND	0.80	7909156			
Tetrachloroethylene	ug/L	4.4	1000	ND	0.40	7909156			
Toluene	ug/L	2	16	ND	0.40	7909156			
Trichloroethylene	ug/L	7.6	400	ND	0.40	7909156			
p+m-Xylene	ug/L	-	-	ND	0.40	7909156			
o-Xylene	ug/L	-	-	ND	0.40	7909156			
Total Xylenes	ug/L	4.4	1400	ND	0.40	7909156			
PCBs									
Total PCB	ug/L	0.4	1	ND	0.05	7912446			
Microbiological									
Escherichia coli	CFU/100mL	200	-	20	10	7908582			

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: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				SFC562			SFC562		
Sampling Date				2022/03/28 17:00			2022/03/28 17:00		
COC Number				n/a			n/a		
	UNITS	Criteria	Criteria-2	MW102	RDL	QC Batch	MW102 Lab-Dup	RDL	QC Batch
Surrogate Recovery (%)									
2,4,6-Tribromophenol	%	-	-	68		7910198			
2-Fluorobiphenyl	%	-	-	56		7910198			
D14-Terphenyl (FS)	%	-	-	95		7910198			
D5-Nitrobenzene	%	-	-	83		7910198			
D8-Acenaphthylene	%	-	-	71		7910198			
Decachlorobiphenyl	%	-	-	75		7912446			
4-Bromofluorobenzene	%	-	-	93		7909156			
D4-1,2-Dichloroethane	%	-	-	109		7909156			
D8-Toluene	%	-	-	91		7909156			

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: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

GENERAL COMMENTS

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

Package 1	9.3°C

Sample SFC562 [MW102] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Bureau Veritas Job #: C281305
Report Date: 2022/04/06

QUALITY ASSURANCE REPORT

B.I.G Consulting Inc.
Client Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Sampler Initials: JR

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7909156	4-Bromofluorobenzene	2022/03/31	103	70 - 130	103	70 - 130	96	%				
7909156	D4-1,2-Dichloroethane	2022/03/31	103	70 - 130	100	70 - 130	107	%				
7909156	D8-Toluene	2022/03/31	101	70 - 130	103	70 - 130	93	%				
7910198	2,4,6-Tribromophenol	2022/03/30	97	10 - 130	91	10 - 130	70	%				
7910198	2-Fluorobiphenyl	2022/03/30	70	30 - 130	75	30 - 130	78	%				
7910198	D14-Terphenyl (FS)	2022/03/30	99	30 - 130	95	30 - 130	98	%				
7910198	D5-Nitrobenzene	2022/03/30	93	30 - 130	92	30 - 130	100	%				
7910198	D8-Acenaphthylene	2022/03/30	79	30 - 130	81	30 - 130	84	%				
7912446	Decachlorobiphenyl	2022/03/31	76	60 - 130	62	60 - 130	75	%				
7908448	Fluoride (F-)	2022/03/31	100	80 - 120	95	80 - 120	ND, RDL=0.10	mg/L	NC	20		
7908454	pH	2022/03/31			101	98 - 103			1.7	N/A		
7908901	Total BOD	2022/04/03					ND,RDL=2	mg/L	NC	30	87	80 - 120
7909156	1,1,2,2-Tetrachloroethane	2022/03/31	91	70 - 130	95	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7909156	1,2-Dichlorobenzene	2022/03/31	95	70 - 130	103	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7909156	1,4-Dichlorobenzene	2022/03/31	110	70 - 130	121	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7909156	Benzene	2022/03/31	95	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	Chloroform	2022/03/31	101	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	cis-1,2-Dichloroethylene	2022/03/31	100	70 - 130	101	70 - 130	ND, RDL=0.50	ug/L	NC	30		
7909156	Ethylbenzene	2022/03/31	89	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	Methylene Chloride(Dichloromethane)	2022/03/31	116	70 - 130	114	70 - 130	ND, RDL=2.0	ug/L	NC	30		
7909156	o-Xylene	2022/03/31	87	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	p+m-Xylene	2022/03/31	97	70 - 130	103	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	Tetrachloroethylene	2022/03/31	96	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	Toluene	2022/03/31	96	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC	30		
7909156	Total Xylenes	2022/03/31					ND, RDL=0.20	ug/L	NC	30		
7909156	trans-1,3-Dichloropropene	2022/03/31	102	70 - 130	97	70 - 130	ND, RDL=0.40	ug/L	NC	30		
7909156	Trichloroethylene	2022/03/31	107	70 - 130	110	70 - 130	ND, RDL=0.20	ug/L	4.5	30		
7909260	Mercury (Hg)	2022/03/29	87	75 - 125	89	80 - 120	ND, RDL=0.00010	mg/L	NC	20		
7909782	Phenols-4AAP	2022/03/29	93	80 - 120	96	80 - 120	ND, RDL=0.0010	mg/L	NC	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7910198	1,3-Dinitropyrene	2022/03/30	105	30 - 130	110	30 - 130	ND, RDL=0.4	ug/L	NC	40		
7910198	1,6-Dinitropyrene	2022/03/30	102	30 - 130	102	30 - 130	ND, RDL=0.4	ug/L	NC	40		
7910198	1,8-Dinitropyrene	2022/03/30	104	30 - 130	104	30 - 130	ND, RDL=0.4	ug/L	NC	40		
7910198	3,3'-Dichlorobenzidine	2022/03/30	73	30 - 130	86	30 - 130	ND, RDL=0.8	ug/L	NC	40		
7910198	7H-Dibenzo(c,g) Carbazole	2022/03/30	105	30 - 130	98	30 - 130	ND, RDL=0.4	ug/L	NC	40		
7910198	Anthracene	2022/03/30	100	30 - 130	101	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Benzo(a)anthracene	2022/03/30	101	30 - 130	96	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Benzo(a)pyrene	2022/03/30	116	30 - 130	112	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Benzo(b/j)fluoranthene	2022/03/30	113	30 - 130	105	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Benzo(e)pyrene	2022/03/30	112	30 - 130	108	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Benzo(g,h,i)perylene	2022/03/30	110	30 - 130	107	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Benzo(k)fluoranthene	2022/03/30	116	30 - 130	104	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Bis(2-ethylhexyl)phthalate	2022/03/30	112	30 - 130	103	30 - 130	ND,RDL=2	ug/L	NC	40		
7910198	Chrysene	2022/03/30	115	30 - 130	114	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Dibenzo(a,h)anthracene	2022/03/30	109	30 - 130	109	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Dibenzo(a,i)pyrene	2022/03/30	89	30 - 130	84	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Dibenzo(a,j) acridine	2022/03/30	117	30 - 130	117	30 - 130	ND, RDL=0.4	ug/L	NC	40		
7910198	Di-N-butyl phthalate	2022/03/30	100	30 - 130	98	30 - 130	ND,RDL=2	ug/L	NC	40		
7910198	Fluoranthene	2022/03/30	112	30 - 130	106	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Indeno(1,2,3-cd)pyrene	2022/03/30	116	30 - 130	116	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Pentachlorophenol	2022/03/30	49	30 - 130	41	30 - 130	ND,RDL=1	ug/L	NC	40		
7910198	Perylene	2022/03/30	112	30 - 130	113	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Phenanthrene	2022/03/30	102	30 - 130	101	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7910198	Pyrene	2022/03/30	113	30 - 130	108	30 - 130	ND, RDL=0.2	ug/L	NC	40		
7911212	Chromium (VI)	2022/03/30	100	80 - 120	104	80 - 120	ND, RDL=0.50	ug/L	NC	20		
7912143	Total Cyanide (CN)	2022/03/30	94	80 - 120	94	80 - 120	ND, RDL=0.0050	mg/L	NC	20		
7912446	Total PCB	2022/03/31	82	60 - 130	53 (1)	60 - 130	ND, RDL=0.05	ug/L	NC	40		
7916428	Total Kjeldahl Nitrogen (TKN)	2022/04/01	105	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	20	99	80 - 120
7916768	Total Suspended Solids	2022/04/04					ND, RDL=10	mg/L	21	25	97	85 - 115

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7919418	Nonylphenol (Total)	2022/04/05	97	50 - 130	88	50 - 130	ND, RDL=0.001	mg/L	NC	40		
7919419	Nonylphenol Ethoxylate (Total)	2022/04/05	77	50 - 130	79	50 - 130	ND, RDL=0.005	mg/L	NC	40		
7922065	Total Oil & Grease	2022/04/05			99	85 - 115	ND, RDL=0.50	mg/L	1.3	25		
7922067	Total Oil & Grease Mineral/Synthetic	2022/04/05			96	85 - 115	ND, RDL=0.50	mg/L	2.6	25		
7922417	Total Aluminum (Al)	2022/04/06	102	80 - 120	101	80 - 120	ND, RDL=4.9	ug/L	14	20		
7922417	Total Antimony (Sb)	2022/04/06	111	80 - 120	105	80 - 120	ND, RDL=0.50	ug/L	NC	20		
7922417	Total Arsenic (As)	2022/04/06	103	80 - 120	104	80 - 120	ND, RDL=1.0	ug/L	2.4	20		
7922417	Total Cadmium (Cd)	2022/04/06	102	80 - 120	101	80 - 120	ND, RDL=0.090	ug/L	NC	20		
7922417	Total Chromium (Cr)	2022/04/06	99	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L	NC	20		
7922417	Total Cobalt (Co)	2022/04/06	99	80 - 120	102	80 - 120	ND, RDL=0.50	ug/L	NC	20		
7922417	Total Copper (Cu)	2022/04/06	98	80 - 120	98	80 - 120	ND, RDL=0.90	ug/L	NC	20		
7922417	Total Lead (Pb)	2022/04/06	98	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	NC	20		
7922417	Total Manganese (Mn)	2022/04/06	99	80 - 120	102	80 - 120	ND, RDL=2.0	ug/L	1.3	20		
7922417	Total Molybdenum (Mo)	2022/04/06	103	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L	0.69	20		
7922417	Total Nickel (Ni)	2022/04/06	96	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L	1.4	20		
7922417	Total Phosphorus (P)	2022/04/06	98	80 - 120	105	80 - 120	ND, RDL=100	ug/L				
7922417	Total Selenium (Se)	2022/04/06	104	80 - 120	107	80 - 120	ND, RDL=2.0	ug/L	NC	20		
7922417	Total Silver (Ag)	2022/04/06	96	80 - 120	96	80 - 120	ND, RDL=0.090	ug/L	NC	20		
7922417	Total Tin (Sn)	2022/04/06	104	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L	NC	20		
7922417	Total Titanium (Ti)	2022/04/06	100	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L	NC	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7922417	Total Zinc (Zn)	2022/04/06	97	80 - 120	103	80 - 120	ND, RDL=5.0	ug/L	1.3	20		

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 (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).

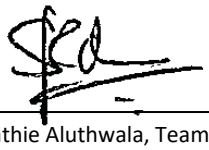
(1) Spike recovery is below the control limit stipulated by Ont Reg 153, however, this recovery is still within Bureau Veritas Laboratories' performance based limits. Results reported with recoveries within this range are still valid but may have a low bias.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

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



Sirimathie Aluthwala, Team Lead

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 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Bureau Veritas Job #: C281305
Report Date: 2022/04/06

B.I.G Consulting Inc.
Client Project #: BIGC-ENV-520A
Site Location: 914 BATHURST ST
Sampler Initials: JR

Exceedance Summary Table – Toronto Storm Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
MW102	SFC562-07	Total Manganese (Mn)	50	140	2.0	ug/L
MW102	SFC562-05	Total Suspended Solids	15	47	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.

Exceedance Summary Table – Toronto Sanitary Sewer

Result Exceedances

Sample ID	Bureau Veritas 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.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

MICRO

www.BVNA.com

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

CHAIN OF CUSTODY RECORD

ENV COC - 00014v2

28-Mar-22 18:45
Deepthi Shaji
C281305

KSE ENV-2098

Invoice Information	Invoice to (requires report) ☐	Report Information (if differs from invoice)		Project Information	
Company:	#31796 BIG Consulting Inc	Company:		Quotation #:	
Contact Name:	Accounts Payable	Contact Name:	Eileen Liu	P.O. #/ AFE#:	
Street Address:	12-5?? Tomken Road	Street Address:		Project #:	BIGC-ENV-520A
City: Mississauga Prov: ON Postal Code: [illegible]		City: Prov: Postal Code:		Site #:	
Phone:	416-214-4588	Phone:		Site Location:	914 Bathurst St.
Email:	Loughery@[illegible]fieldig.com	Email:	Eliu@bigconsultinginc.com	Site Location Province:	ON
Copies:		Copies:		Sampled By:	JR/TD

Regulatory Criteria

REG 153: ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ______ ☐ Res/Park ☐ Ind/Comm ☐ Agri/other ☐ Med/Fine ☐ Course ☐ For RSC

OTHER: ☐ CCME ☐ Reg 558* *min 3 day TAT ☐ MISA ☐ PWQO ☐ Reg 406, Table: ______ ☑ Sanitary Sewer Bylaw ☑ Storm Sewer Bylaw Municipality TORONTO ☐ Other:

Include Criteria on Certificate of Analysis (check if yes): ☑

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

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX/F1	5 F2-F4	6 VOCs	7 Reg 153 metals and inorganics	8 Reg 153 ICPMS metals	9 Reg 153 metals (Hg, Cr VI, ICPMS metals, HWS - B)	10 Toronto Sanitary & Storm Sewer (100-2016)	11	12	13	14	15	16	17	18	19	20	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	MW102	22	03	28	17	00	GW	N									✓											4		
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

Regular Turnaround Time (TAT): ☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply: ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY ___ MM ___ DD ___

LAB USE ONLY	Yes	No	°C 1	2	3	LAB USE ONLY	Yes	No	°C 1	2	3	LAB USE ONLY	Yes	No	°C 1	2	3	Temperature reading by:
Seal present	✓		10	8	10	Seal present						Seal present						
Seal intact	✓					Seal intact						Seal intact						
Cooling media present	✓					Cooling media present						Cooling media present						

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Julia Romano [signature]	22	03	28	18	40	1 Kavithaselvan [signature]	2022	03	28	18	45	
2						2						

APPENDIX E: CONSTRUCTION DEWATERING ESTIMATE RATE CALCULATIONS

Construction Dewatering Rate Estimate

914 Bathurst Street, Toronto, Ontario
Two (2) levels of underground parking, unconfined aquifer, groundwater seepage to square excavation (radial source)

Table E-1: Construction Dewatering Rate Estimates

Description	Symbol	Values	Unit	Explanation
Input				
Lowest Ground Elevation		117.09	m asl	Based on borehole logs
Highest Groundwater Level		113.63	m asl	Highest groundwater elevation on April 1, 2022
Footing Elevation		108.09	m asl	Assumed 2m below FFE, P2 FFE is assumed 7 m bgs.
Aquifer Bottom		103.09	m asl	Assumed 5 m below footing elevation
Hydraulic Conductivity	K	6.23E-07	m/s	Geometric mean K
Length of Excavation	x	41.0	m	Based on aerial extent of the Site
Width of Excavation	a	39.0	m	Based on aerial extent of the Site
Output				
Top of Aquifer		113.63	m asl	Water table for unconfined aquifer
Target Water Level		107.09	m asl	Assumed 1.0 m below footing elevation
Water Level above aquifer bottom before dewatering	H	10.5	m	
Target water level above aquifer bottom	h	4.0	m	
Equivalent Radius	Re	25.5	m	
Radius of Influence	L (R_0)	41.0	m	Sichardt Equation (C=3000 for radial source)
Construction dewatering flow rate - Steady State	Q	33.9	m^3/day	Dupuit's Equation
Maximum construction dewatering flow rate (safety factor of 3)	3Q	101.6	m^3/day	
Construction Dewatering Flow Rate - Steady State	Q	**34,000**	L/day	
Maximum Construction Flow Rate (safety factor of 3)	3Q	**102,000**	L/day	