Hydrogeological Investigation

Proposed Residential Development

1225 Dundas Street East, Mississauga, Ontario

Submitted to:
Mr. Daniel Orellana
Dundix Realty Holdings
3200 Highway 7,
Vaughan, Ontario L4K 5Z5

Submitted by:
GEI Consultants Ltd.
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
www.canada.geiconsultants.com

June 30, 2022
Project 2202029

Issues and Revisions Registry

Identification	Date	Description of Issued and/or Revision
First Submission	June 24, 2022	DRAFT Hydrogeological Investigation

Table of Contents

Table of Contents (Continued)

Figures

Appendices

1. Introduction

GEI Consultants (GEI) was retained by Dundix Realty Holdings (Client), to complete a Hydrogeological Site Assessment for a proposed residential development at 1225 Dundas Street East, Mississauga, Ontario (Site). A site location plan is enclosed as Figure 1.

The existing site is generally rectangular in shape, and measures approximately 92 metres north to south by 122 to 130 metres east to west, with an approximate area of 12,300 m^2 (1.23 hectares). The site is bounded by Dundix Road to the north, an existing 6 storey residential building to the east, Dundas Street to the south, and Arena Road to the west. The site is currently developed with a 1 storey block building containing a number of commercial units, and the existing site grades are near Elev. 120 to 121 m. An aerial image of the site is shown on Figure 2A.

GEI reviewed the following drawings in preparation of this report:

- *"Proposed Residential Mix-Use Development, 1225 Dundas Street E, Mississauga, ON,"* Project No. 22.117P01, Draft Concept Plan dated June 16, 2022, by Turner Fleischer Architects Inc.
- *"Draft Plan of Survey Showing Topographic Features of Part of Lot 7, Concession 1, North and South of Dundas Street, City of Mississauga, Regional Municipality of Peel,"* Project No. 22-B7880, draft dated May 10, 2022, by Mauro Group Inc.
- *"Grading and Servicing Plan,"* Drawing No. C-101, Project No. 160623078, by Stantec.

The proposed mixed-use re-development consists primarily of residential space. The entire site will have one (1) level of underground parking, with the parking level 1 (P1) slab set at Elev. 116.0 m. The northern part of the site will contain 4 blocks of 3-storey townhouses with the finished floor elevation (FFE) set near Elev. 121.6 to 122 m. The southern part of the site will consist of primarily residential space, including 9 storeys of residential units with 12-storey towers on the east and west sides of the building. The ground floor will contain townhouse units, retail and amenity spaces and garbage rooms with the FFEs ranging from near Elev. 120.4 to 121.1 m. There will be on-grade driving lanes and parking spaces through the middle of the site, and the site is municipally serviced.

It is noted that GEI completed a concurrent Phase One and Two Environmental Site Assessment in support of a Record of Site Condition, and a geotechnical investigation and report under separate covers.

It is noted that the recommendations provided in this report must be considered preliminary in nature due to the current uncertainly of the design for the project. As the design progresses further hydrogeological review and input may be required which might necessitate the need for additional investigation and/or analysis.

1.1 Purpose and Scope of Work

The main objectives of the Hydrogeological Investigation were to:

a) Establish the local hydrogeological settings of the site;

b) Provide an assessment of anticipated construction dewatering flow rates for a generic construction scenario;
c) Assess groundwater quality and compare the results to the applicable City of Mississauga/Region of Peel Sewer Use By-Law Criteria;
d) Qualitatively assess the potential impact to the nearby structures, water bodies and water uses, if any, and comment on future regulatory agency involvement; and
e) Prepare a Hydrogeological Investigation Report.

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

a) Conduct a background desktop review of pertinent geological and hydrogeological resources, Ministry of Environment, Conservation and Parks (MECP) Water Well Records, previous reports, and proposed site plan drawings.
b) Visit the site and note existing site conditions, site setting, topography, drainage, water features, and potential water wells within 500 m of the site, if any.
c) As part of the concurrent Geotechnical Investigation, complete twelve (12) boreholes and twelve (12) monitoring wells.
d) Revisit the site and measure groundwater levels, perform borehole permeability testing at select monitoring wells, and retrieve representative groundwater samples.
e) Submit one (1) representative unfiltered groundwater samples for laboratory testing to compare against the City of Mississauga Storm Sewer By-Law Criteria and the Region of Peel Storm and Sanitary Sewer By-Law Criteria.
f) Submit one (1) representative filtered groundwater samples for laboratory testing to compare against the City Mississauga and the Region of Peel Storm Sewer By-Law Criteria for metals and Total Suspended Solids (TSS) only.
g) Evaluate the background information, and field and laboratory data to assess construction dewatering requirements.
h) Prepare a Hydrogeological Investigation report.

1.2 Regulatory Requirements for Water Taking

1.2.1 Water Taking – Temporary

The volume of water entering the excavation during construction will be based on both groundwater infiltration and precipitation events. Based on O.Reg. 63/16, the following dewatering limits and requirements are as follows:

- Construction Dewatering less than 50,000 L/day: The takings of both groundwater and stormwater does not require a hydrogeological report, does not require registration on the Environmental Activity and Sector Registry (EASR), and does not require a Permit to Take Water (PTTW) from the MECP.
- Construction Dewatering greater than 50,000 L/day and less than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and registration on the EASR but does not require a PTTW from the MECP.
- Construction Dewatering greater than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and requires a PTTW from the MECP.

For permanent dewatering, based on Section 34 of O.Reg. 387/04, the dewatering limits and requirements are as follows:

- Water Taking less than 50,000 L/day: A Permit to Take Water (PTTW) is not required from the MECP.
- Water Taking greater than 50,000 L/day: A PTTW is required from the MECP.

1.2.2 Source Water Protection

The site is within the jurisdiction of the Credit Valley Source Water Protection Area and the Credit Valley Conservation Authority (CVC). The following documents should be used in determination of the regulatory requirements when it comes to maintaining hydrogeological function at this site:

- "Approved Source Protection Plan: CTC Source Protection Region", dated March 2, 2022, by CTC Source Protection Committee.

Based on Source Water Protection online mapping, the following is noted:

- Wellhead Protection Area (WHPA): The site is not located within a WHPA (Figure 3).
- Intake Protection Zone (IPZ): The study area is not located within an IPZ (Figure 4).
- Highly Vulnerable Aquifer (HVA): The site is not located within an HVA (Figure 5).
- Significant Groundwater Recharge Area (SGRA): The site is not located within an SGRA (Figure 6).
- The site is not located within the Oak Ridges Moraine or Niagara Escarpment.

1.2.3 City of Mississauga Requirements

As the site is located in Mississauga, the Terms of Reference for Hydrogeological Reports (July, 2021 by the City of Mississauga) apply. These terms of reference give details regarding who prepares the report, why it is required, when it is required, and a detailed list of how to prepare it, including the Introduction and Description, Investigation Methods, Conclusions and Recommendations, and Appendices. This hydrogeological study confirms to the requirements as outlined in these Terms of Reference.

2. Site Setting

2.1 Physiography, Surficial and Bedrock Geology

The site is located within the physiographic region denoted as the Iroquois Plain consisting of sand plains (Chapman and Putnam, 1984). Ontario Geological Survey surficial geological mapping indicates the site and surrounding area is predominantly fine to coarse textured glaciolacustrine deposits comprising sand and gravel with minor silt and clay. These findings are generally consistent with the subsurface soil conditions encountered in the boreholes advanced on site, as discussed in Section 4.1.

The bedrock in the general area consists of shale and limestone of the Georgian Bay Formation. Bedrock was encountered at the site at approximately 2.3 to 4.6 m below existing grade based on the geotechnical boreholes completed on-site.

2.2 Topography and Drainage

The area surrounding the site slopes towards Lake Ontario to the south of the site. The local elevation on-site is fairly flat and ranges from 120.4 to 121.0 metres, about 0.6 metres of topographic relief across the site. It is anticipated that the site will drain towards the south/southeast towards the Little Etobicoke Creek and/or Etobicoke Creek, which ultimately drains to Lake Ontario.

There are no water bodies located on-site, and the closest water body is the Little Etobicoke Creek located approximately 400 m north of the site which drains to the Etobicoke Creek locate approximately 1.8 km south/southeast of the site. The site is located within the Etobicoke Creek Watershed, in the jurisdiction of CVC and the Credit Valley Source Protection Area.

2.3 MECP Water Well Records

MECP water well records were obtained within 500 metres of the site area to assess the general nature of the groundwater resource in near vicinity of the site, and historical/current uses of wells in the area. Thirty-six (36) well records were found, the approximate MECP well locations are shown on Figure 7 and a well records summary table is included in Appendix A.

The wells were installed for the following uses:

- Eleven (11) of the records indicate monitoring and/or test well use.
- Fourteen (14) of the records indicate not in use.
- Eleven (11) of the records did not indicate well use.

The stratigraphic descriptions within the MECP monitoring well records are typically inaccurate due to the methodology in which they are determined (observations of cuttings and no consistency between descriptions of soil between different drillers). Though this is the case, an overall sense of the deep stratigraphy can be determined by looking at commonalities between most stratigraphic descriptions and where the wells were terminated in an aquifer. The well records typically indicate sand and silt with variable clay deposits over shale and/or limestone. The

monitoring wells were installed in either the shale bedrock and/or upper sand and silt deposits at depths of 2 to 8 m below existing grade.

2.4 Site Condition Standards

The MECP has developed a set of Soil, Ground water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 15, 2011) and O. Reg. 153/04, as amended. The standards consist of nine tables (Table 1 through Table 9) that provide criteria for maximum concentrations of various contaminants. In general, the applicable O. Reg. 153/04, as amended, SCSs depend on the site location, land use, soil texture, bedrock depth and the applicable potable or non-potable ground water condition at the investigation site.

In order, to determine the Site Sensitivity, Sections 41 and 43.1 of O. Reg. 153/04, as amended, were evaluated by GEI as shown in the following table:

CRITERIA	RESULT
Current Property Use	Commercial
Potable vs. Non-Potable Ground Water	Non-Potable
Proximity of Areas of Natural Significance	>30 m
Proximity to a Water Body	>30 m
Shallow Soil Condition	No
Land Use	Institutional/Commercial/Community
Applicable Site Condition Standard	Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater condition (Table 3 ICC)

2.5 Visual Inspection of the Site

A visual site inspection was carried out on May 26, 2022, by GEI staff to assess site drainage, topography and presence of surface water features.

The site is rectangular shape with a total site area of 12,300 m^2. The site is bounded by Dundix Road to the north, an existing 6 storey residential building to the east, Dundas Street to the south, and Arena Road to the west. The site is currently developed with a 1 storey block building containing a number of commercial units, and the existing site grades are near Elev. 120 to 121 m.

The surrounding areas of the Site are all approximately at similar elevations. Though the regional topography would drain towards the south/southeast towards the Little Etobicoke Creek and/or Etobicoke Creek, which ultimately drains to Lake Ontario, any surface run-off would be captured by the municipal storm system.

3. Procedures and Methodology

Borehole locations are shown on Figures 2A/2B, borehole logs are provided in Appendix B, and results from the geotechnical laboratory testing are provided in Appendix C.

Prior to the commencement of drilling activities, the locations of underground utilities including natural gas, electrical, telephone, water, etc. were marked out by public and private utility locating companies. The fieldwork for the drilling program was carried out between May 24 to 26, 2022. A total of twelve (12) boreholes (Boreholes 1 to 12) were advanced on site by a drilling subcontractor retained by GEI. The boreholes were advanced using a track-mounted drill, solid and/or hollow stem augers, and standard soil sampling equipment. All samples were collected as per ASTM D1586 to assess the strength characteristics of the substrate. Borehole logs are provided in Appendix B.

The boreholes were advanced to a depth of 3.0 to 9.2 metres below existing grade (Local elevation 113.0 to 117.4). The horizontal locations were laid out in the field by GEI prior to the drilling operations. Ground surface elevations of the boreholes were surveyed relative to a local benchmark (top of storm catchbasin located to the north of Dundas Street East approximately 15.0 m northeast/east of Arena Road) established at the site, which was assigned an elevation of 119.88 metres based on *Plan CDU-42-18, Dundas Street East Segment B 'Priority', in the City of Mississauga by Callon Dietz Locates Incorporated*.

Twelve (12) monitoring wells (BH/MW1 to 12) were installed by GEI on site to facilitate long-term groundwater monitoring. Monitoring well construction is shown on the borehole logs in Appendix B.

The GEI field staff examined and classified characteristics of the soils encountered in the boreholes, including the presence of fill materials, made groundwater observations during and upon completion of the drilling, recorded observations of borehole construction, and processed the recovered samples. Soil sampling was conducted at regular intervals for the full depth of the borehole. All recovered soil samples were logged in the field, carefully packaged, and transported to the laboratory for more detailed examination and classification. In the laboratory, the samples were classified as to their visual and textural characteristics and geotechnical laboratory testing for grain size was carried out with the results provided in Appendix C.

3.1 Borehole Permeability Testing

Rising head tests were completed in six (6) monitoring wells (BH/MW3, 4, 5, 7, 10 and 11) on June 1, 2022. Water was manually purged from monitoring wells using LDPE piping and a foot valve. The static water level was measured prior to the start of testing, and the change in water level was monitored using an electronic level logger. The level loggers were left in the monitoring wells for several hours to allow for adequate recovery of the groundwater. The tests were completed to estimate the horizontal hydraulic conductivity (K) of the soils at the well screen depths.

The semi-log plot for drawdown versus time for the tests are provided in Appendix D.

3.2 Ground Water Sampling

To establish baseline conditions and assess the suitability for discharge of pumped groundwater to surface during potential dewatering activities, the following groundwater samples were collected from the monitoring BH/MW5 on June 6, 2022 and tested relative to the City of Mississauga/Region of Peel Sewer Use By-Law Criteria:

- One (1) unfiltered groundwater sample was collected from BH/MW5 and analyzed against the City of Mississauga Storm Sewer By-Law Criteria and the Region of Peel Storm and Sanitary Sewer By-Law Criteria.
- One (1) filtered groundwater sample was collected from BH/MW5 and analyzed against the City of Mississauga and Region of Peel Storm Sewer By-Law Criteria for metals and TSS only.

Prior to collection of the samples, approximately three (3) standing well volumes of groundwater were purged from the well. The samples were collected and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The field filtered samples were run through a 75 µm filter. The samples were submitted to CALA- accredited Caduceon Environmental Laboratories for analysis. The results of the groundwater chemistry are presented in the laboratory Certificates of Analysis provided in Appendix E.

4. Subsurface Conditions

4.1 Stratigraphy

The borehole locations are shown on Figures 2A and 2B. Detailed soil profiles encountered in the GEI boreholes are indicated on the attached borehole logs in Appendix A, with the results of geotechnical laboratory testing included in Appendix B. Subsurface profiles beneath the site are included as Figures 3A and 3B and the profile alignments are shown in plan view on Figures 2A and 2B.

It should be noted that the conditions indicated on the borehole logs and subsurface profiles are for specific locations only and can vary between and beyond the locations. It should be noted that the soil boundaries indicated on the borehole logs and subsurface profiles are inferred from non-continuous sampling and observations during drilling, or from recovered rock core. These boundaries are intended to reflect approximate transition zones and should not be interpreted as exact planes of geological change.

In addition, the descriptions provided in the borehole logs are inferred from a variety of factors, including: visual observations of the soil samples retrieved, laboratory testing, measurements prior to and after drilling, and the drilling process itself (speed of drilling, shaking/grinding of the augers, etc.). The passage of time also may result in changes in conditions interpreted to exist at locations where sampling was conducted.

4.1.1 Pavement Structure and Earth Fill

The boreholes encountered a pavement structure at the ground surface consisting of 25 to 100 mm of asphalt underlain by 50 to 150 mm of granular material.

Boreholes 1 to 4 and 6 to 12 encountered what appeared to be a granular fill (typically containing significant sand and gravel percentage with relatively minimal fines) underlying the pavement structure. The granular fill extended to depths of 0.8 to 1.5 m below grade (Elev. 120.2 to 119.3 m) and was brown and moist. The SPT “N” Values measured in the granular fill ranged from 4 to 24, indicating a loose to compact relative density. Composite samples of the granular fill were collected from the boreholes and tested relative to OPSS.MUNI 1010 specifications for Granular ‘A’ and ‘B’ Type I. The results are included in Appendix B and show that the samples exceed the percent passing specification for Granular ‘A’ for multiple sieve sizes, and exceed specifications for Granular ‘B’ Type I for fines content (percent of material passing the 75 µm sieve).

The granular fill was underlain by common earth fill in Boreholes 1 to 4, 7, 10 and 12, and the common earth fill was encountered below the pavement structure in Borehole 5. The earth fill extended to depths of 0.9 to 2.3 m below grade (Elev. 119.7 to 118.0 m) and ranged in composition from clayey silt, to sand, to silty sand, to sandy silt, typically with trace to some gravel. The earth fill was moist and ranged in colour from brown, to grey, to black. The SPT “N” Values ranged from 3 to 13, indicating a very loose to compact (but typically loose) relative density.

4.1.2 Sand and Glacial Till Deposits

Cohesionless deposits of sand, some gravel to gravelly, with trace silt and clay were encountered underlying the fill material in Boreholes 1, 2, 5 to 7, and 9 to 12. The sands were encountered at depths of 0.8 to 1.5 m below grade (Elev. 119.9 to 118.7 m) and extended to 1.5 to 2.6 m (Elev. 119.2 to 117.9 m). The sands were brown to greyish brown and moist. SPT "N" Values ranged from 8 to greater than 100 blows per 300 mm of penetration, indicating a loose to very dense (but typically compact) relative density.

Boreholes 3, 6, 11 and 12 encountered a deposit of glacial till with a cohesive matrix comprising sandy silt, with some clay and trace to some gravel. Cobbles and boulders are likely embedded within the deposit. The glacial till was encountered underlying the earth fill or sand deposits at depths of 1.5 to 2.4 m below grade (Elev. 119.2 to 118.1 m) and extended to 2.3 to 3.0 m (Elev. 118.4 to 117.4 m). The "N" Values ranged from 8 to 29 blows, indicating a firm to very stiff consistency.

4.1.3 Bedrock

Bedrock of the Georgian Bay Formation (laminated to thinly bedded grey shale with limestone interbeds) was encountered in all borehole locations underlying the overburden soils. The bedrock was inferred in Boreholes 1 to 8 and 10 by drilling observations, auger grinding, and samples recovered from the split spoon sampler. Rock core was recovered from Boreholes 9, 11 and 12 using HQ coring equipment to confirm the type of bedrock, weathering profile, Total Core Recovery (TCR), Solid Core Recovery (SCR), Rock Quality Designation (RQD), and percentage of harder layers (limestone interbeds). The depths of inferred or cored bedrock and method of identification are summarized below.

Borehole Location	Ground Surface Elevation (m)	Depth / Elev. (m) of Inferred Weathered Bedrock Surface	Depth / Elev. (m) of Sound (Unweathered) Bedrock	Method of Bedrock Identification
1	120.4	2.3 / 118.1	-	Drilling Observations, Auger Grinding, Split Spoon Samples
2	120.5	2.3 / 118.2	-	
3	120.4	3.0 / 117.4	-	
4	120.3	2.3 / 118.0	-	
5	120.2	3.0 / 117.4	-	
6	120.7	2.3 / 118.4	-	
7	120.6	1.5 / 119.1	-	
8	121.0	1.5 / 119.5	-	
9	120.8	2.3 / 118.5	4.4 / 116.4	Rock Coring from 3.5 to 7.7 m Below Grade

Borehole Location	Ground Surface Elevation (m)	Depth / Elev. (m) of Inferred Weathered Bedrock Surface	Depth / Elev. (m) of Sound (Unweathered) Bedrock	Method of Bedrock Identification
10	120.6	2.6 / 118.0	-	Drilling Observations, Auger Grinding, Split Spoon Samples
11	120.8	3.0 / 117.8	4.0 / 116.8	Rock Coring from 3.6 to 7.8 m Below Grade
12	120.7	3.0 / 117.7	4.5 / 116.2	Rock Coring from 3.5 to 7.7 m Below Grade

Based on the borehole results, the inferred weathered bedrock surface was encountered at depths of 0.8 to 3.0 m below grade (Elev. 119.5 to 117.4 m), or at Elev. 118.3 m on average. Sound (unweathered) bedrock was identified from the rock core in Boreholes 9, 11 and 12 to be at Elev. 116.8 to 116.2 m. The thickness of the weathered bedrock zone ranged from 1.0 to 2.1 m in the cored holes and could be up to 4 metres thick elsewhere on site based on the borehole findings. This amount of weathering is typical for the Georgian Bay Formation that is encountered near surface.

4.2 Water Level Monitoring

Unstabilized groundwater level measurements and borehole sloughing (caving) measurements were not taken upon completion of drilling due to the monitoring well installations.

Monitoring wells were installed in twelve (12) boreholes (BH/MW1 to 12) to facilitate the measurements of stabilized groundwater levels. A 50 mm diameter PVC monitoring well with a 1.5 to 3.0-metre-long screen was installed in all monitoring wells. Monitoring well construction and groundwater measurements are shown on the borehole logs in Appendix B, and the results are summarized in the table below.

Monitoring Wells	Well Screen Location		Strata Screened	Groundwater Level Depth / Elev. (m)
	Depth (m)	Elev. (m)		June 1, 2022
BH/MW 1	1.4 to 2.9	119.1 to 117.5	Sand; Weathered Bedrock	2.2 / 118.2
BH/MW 2	1.5 to 3.0	119.0 to 117.5	Fill; Sand; Weathered Bedrock	2.8 / 117.7
BH/MW 3	1.5 to 4.5	118.9 to 115.9	Fill; Glacial Till; Weathered Bedrock	3.5 / 116.9
BH/MW 4	1.7 to 3.2	118.6 to 117.1	Fill; Weathered Bedrock	2.3 / 118.0
BH/MW 5	1.6 to 3.1	118.6 to 117.1	Sand; Weathered Bedrock	2.1 / 118.1
BH/MW 6	1.6 to 3.1	119.1 to 117.6	Sand; Glacial Till	2.7 / 118.0

Monitoring Wells	Well Screen Location		Strata Screened	Groundwater Level Depth / Elev. (m)
	Depth (m)	Elev. (m)		June 1, 2022
BH/MW 7	1.5 to 3.0	119.1 to 117.6	Sand; Weathered Bedrock	2.6 / 118.0
BH/MW 8	0.9 to 3.0	120.1 to 118.0	Weathered Bedrock	Dry
BH/MW 9	6.1 to 7.6	114.7 to 113.2	Sound Bedrock	2.9 / 117.9
BH/MW 10	5.6 to 8.6	115.0 to 112.0	Inferred Sound Bedrock	3.0 / 117.6
BH/MW 11	4.7 to 7.7	116.1 to 113.1	Sound Bedrock	3.2 / 117.6
BH/MW 12	4.7 to 7.7	116.0 to 113.0	Sound Bedrock	3.3 / 117.4

The stabilized groundwater levels in the monitoring wells were measured to range between approximately Elev. 116.99 to 118.16 metres, or about 2.1 to 3.5 metres below grade.

Groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions.

It is anticipated that the local ground water flow will be to the south/southeast towards Little Etobicoke Creek, as shown in Figure 10.

4.3 Hydraulic Conductivity Testing

Hydraulic conductivity values were calculated from the rising head test data using Hvorslev's solution (1951) where the well screen was fully saturated. The semi-log plots for the results are provided in Appendix D and are summarized in the table below.

Monitoring Wells	Well Screen Location		Strata Screened	In-Situ Hydraulic Conductivity (K) (m/s)
	Depth (m)	Elev. (m)		
BH/MW 3	1.5 to 4.5	118.9 to 115.9	Fill; Glacial Till; Weathered Bedrock	4.6×10^{-7}
BH/MW 4	1.7 to 3.2	118.6 to 117.1	Fill; Weathered Bedrock	1.9×10^{-7}
BH/MW 5	1.6 to 3.1	118.6 to 117.1	Sand; Weathered Bedrock	1.5×10^{-5}
BH/MW 7	1.5 to 3.0	119.1 to 117.6	Sand; Weathered Bedrock	2.7×10^{-7}
BH/MW 10	5.6 to 8.6	115.0 to 112.0	Inferred Sound Bedrock	1.1×10^{-7}
BH/MW 11	4.7 to 7.7	116.1 to 113.1	Sound Bedrock	1.4×10^{-6}

The actual measured hydraulic conductivity of the deposits are within the expected range. For design purposes, the hydraulic conductivity of the overburden deposits and shale bedrock is 5.0×10^{-7} m/s.

4.4 Groundwater Quality

To assess the suitability for discharge of pumped groundwater to the surface or the existing storm sewer system during dewatering activities, one (1) unfiltered and one (1) filtered groundwater samples were collected from BH/MW5 on June 6, 2022.

For the assessment purposes, the analytical results were compared to both the City of Mississauga and Region of Peel Sewer Use By-Law Criteria.

The results of the groundwater chemistry are presented in the laboratory Certificates of Analysis provided in Appendix E and are summarized below for samples relative to the City of Mississauga and Region of Peel Sewer Use By-Law Criteria, standards.

Monitoring Well Sample Location	Parameters Tested	Exceedances of City of Mississauga Storm Sewer Use By-Law	Exceedances of Region of Peel Storm and/or Sanitary Sewer Use By-Law
BH/MW 5 (Unfiltered)	City of Mississauga Storm Sewer Use By-Law Region of Peel Storm and Sanitary Sewer Use By-Law	TSS, Total Kjeldahl Nitrogen (TKN), Phosphorous, Manganese, Aluminum	Storm Sewer Use By-Law Criteria: TSS, TKN, Phosphorous, Manganese Sanitary Sewer Use By-Law Criteria: No Exceedances
BH/MW 5 (Filtered)	Metals and TSS only	Manganese	Storm Sewer Use Bylaw Criteria: Manganese

The unfiltered groundwater sample collected from BH/MW5 met the Region of Peel Sanitary Sewer Use By-Law Criteria. As such, pumped groundwater can be discharged to existing sanitary sewer infrastructure without further treatment; however, treatment of dewatering discharge by filtration is recommended.

The unfiltered groundwater sample from BH/MW5 met the City of Mississauga/Region Peel Storm Sewer Use By-Law Criteria with the exception of TSS, TKN, phosphorous, manganese, and aluminum. The filtered groundwater sample met the City of Mississauga/Region of Peel Storm Sewer Use By-Law Criteria with the exception of Manganese. If pumped groundwater will be discharged to existing storm sewer infrastructure, it must be suitably treated to remove the parameter exceedances prior to discharge (treatment methods to be determined by the dewatering contractor or civil engineer).

The above chemical results suggest treatment of the dewatering discharge water by filtration may reduce the concentration of metals sufficiently to meet the applicable City of Mississauga/Region of Peel Storm Sewer Use By-Law Critera. Treatment of the dewatering discharge water by

filtration or sedimentation to reduce the concentration of suspended solids, and thus reduce the concentrations of non-dissolved metals, is necessary and may be effective in achieving compliance with the applicable Storm Sewer Use By-Law Criteria. However, other treatment methods may be necessary to reduce the concentration of dissolved analytes including manganese.

It is expected that during construction dewatering, the pumped water is to be first discharged to a silt bag or sedimentation tank at a minimum before being discharged to the existing storm sewer infrastructure.

5. Discussion and Analysis

5.1 Construction Dewatering

5.1.1 Excavations and Temporary Groundwater Control

It is understood that a residential development is proposed for the site, which will include a 12-storey two towered residential building and four three-storey residential townhouses towards the northern portion of the site. Further it is noted that one level of below grade parking is proposed beneath the entire site footprint. At this time, it is understood that the concept plan may change, and that grading, site serving details/inverts or other details of the development have not been established.

For the purposes of this assessment dewatering requirements associated with proposed one level of below grade parking across the entire site footprint was assessed. It was assumed that site servicing would not require excavations beyond the anticipated excavation depths of the proposed below grade parking

For the anticipated one level of below grade parking excavations of up to 5.0 m depth have been assumed.

The stabilized groundwater level measurements were found to range between 2.1 to 3.5 m below existing grade (Local elevation 116.99 to 118.16 metres); however, the groundwater level will change based on seasonal fluctuations.

For conservative purposes, the construction dewatering calculation is based on an open cut excavation or permeable shoring system at the present time. To excavate under dry conditions, the water level is anticipated to be lowered to the base of the excavation which is expected to be within the shale bedrock. Based on the soil and bedrock encountered during the borehole drilling program a conservative hydraulic conductivity of 5.0×10^{-7} m/s has been applied to the entire site.

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 provided excavation depth based on P1 elevation. GEI must be provided with final site servicing and grading plans to verify the design assumptions or update the water taking estimates as needed.

The exact scenario where these groundwater control techniques will work are estimates only and are directly correlated to how coarse/fine the native soils are in an excavation, both the lateral and vertical extent of the cohesionless deposits encountered, and the presence of water-bearing fractures or joints within the bedrock. If the groundwater table is not controlled during construction, the base of the excavations will probably be unstable, leading to difficulties in excavating and placement of footings. A dewatering contractor must review and assess the subsurface conditions to verify which dewatering techniques will work for the site and proposed utility installations, based on their experience and interpretation of the data. A test dig could be carried out to assist

prospective contractors determine the most appropriate dewatering methods based on their own means and methods.

5.1.2 Construction Dewatering Flow Rate Assumptions

The assumptions used for the calculation of the dewatering rates for the proposed development are presented below:

- Existing grades are at an elevation of 120.3 m to 121.0 meters based on the topographic survey of the boreholes on site.
- Groundwater levels should be lowered to the base of the excavation which is assumed to be within the shale bedrock.
- Based on the soil and bedrock encountered during the borehole drilling program a conservative hydraulic conductivity of 5.0 x 10^{-7} m/s has been applied to the entire site. It is noted that although a lower hydraulic conductivity could be utilized for the finer grained soils or tighter sound bedrock, a conservative hydraulic conductivity more reflective of the coarser grained soils was considered applicable given the potential variability in soil between boreholes.
- It has been assumed that surface water will be managed sufficiently such that all surface water is diverted around the proposed excavations and surface water entering the proposed excavation would be minimal.
- The proposed below grade parking will require open cut excavations as deep as 5.0 m below existing grade.
- The highest groundwater levels measured on-site were approximately 2.1 to 3.5 m below existing grade (Local elevation 116.99 to 118.16 metres).

5.1.3 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:

$$R_0 = 3000\ (\mathrm{H} - \mathrm{h})\sqrt{\mathrm{K}}$$

Where:

K = Hydraulic conductivity (m/s)

H = Static Saturated Head (m)

h = Dynamic Saturated Head (m)

R_0 = Radius of influence (m)

Based on the Sichardt equation and the hydraulic conductivity of 5.0 x 10^{-7} m/s recommended for calculations at this site, the ROIs for the anticipated building excavation was calculated as 6.1 m from the centre of the excavations for radial flow. Calculation details are provided in Appendix F, and zone-specific ROIs are summarized below:

Zone	Description	ROI (m)
1	Construction Dewatering – One Level of Below Grade Parking	6.1

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.

5.1.4 Temporary Dewatering Flow Rate Equation and Calculations

The Dupuit-Forcheimer method for radial flow from an unconfined aquifer for a fully penetrating excavation was used to obtain a flow rate estimate for the proposed building excavation, and is expressed as follows:

$$Q = \frac{\pi K(H^2 - h^2)}{In\,{}^{R_0}/_{r_s}} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

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

x = Length of excavation (m)

L = Length of excavation (m)

K = Hydraulic conductivity (m/s)

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

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

R_0 = Radius of Influence (m)

r_s = well radius (m)

It is expected that the initial dewatering rates will be higher in order to remove groundwater from within the overburden formation. The dewatering rates are expected to decrease once the target water levels are achieved in the excavation footprints as groundwater will have been removed locally from storage resulting in lower seepage rates into the excavations.

Based on the assumptions provided in this report, the results of the dewatering rate estimates are summarized below, and calculation details are provided in Appendix F:

Location	Construction Dewatering Flow Rate Without Safety Factor	Construction Dewatering Flow Rate Including Safety Factor of 2	Construction Dewatering Flow Rate Including Safety Factor of 2 and a 10 mm Rainfall Event
	L/day	L/day	L/day
Construction Dewatering – One Level of Below Grade Parking	20,284	40,567	172,867

The total construction dewatering flow rates include a factor of safety of 2.0 to account for 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. Further to account for rain events, a 10 mm rain event was considered. This rate should be considered contingency volume subject to the timing and season of the construction. Given that the predicted dewatering volume exceeds 50,000 L/day but remains below the 400,000 L/day limit, it is recommended that an EASR be obtained for the site.

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.

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.

It should be noted that due to inherent uncertainties, there is a potential for required dewatering discharge volumes to still exceed 400,000 L/day, thus violating the EASR requirements and necessitating a PTTW. Dewatering volumes will need to be closely monitored and if required dewatering activities may need to be staged such that dewatering discharge rates remain below the 400,000 L/day threshold.

In accordance with O.Reg.63/19 and the EASR registration requirements both a water taking and discharge plan completed by a Qualified Person are provided in Appendix G and H, accordingly. The water taking plan provides a summary of the dewatering ROI, estimated settlement, assessment of potential impact on other water users, and a dewatering monitoring program. The discharge plan provides details regarding expected dewatering discharge rate(s), location(s) of discharge, method of water taking, and erosion and settlement control measures.

No dewatering more than 50,000 L/day will take place until the proposed water taking is registered on the EASR registry.

5.2 Long Term Discharge Estimate

Given that the groundwater level is above foundation depths for the proposed development, a permanent foundation sub-drain is recommended. It is assumed that the below grade structure will feature a perimeter drain and sub-drain system installed at approximately 0.5 m below the slab elevation.

5.2.1 Permanent Dewatering Flow Rate Assumptions

The assumptions used for the calculation of the permanent dewatering rate for the proposed building are presented below:

- Existing grades are at an elevation of 120.3 m to 121.0 meters based on the topographic survey of the boreholes on site.
- The lowest Basement Finished Floor Elevation (BFE) of the below grade parking is assumed to be Elev. 116.0.
- The subdrain is assumed to be at a depth of 0.5 m below the FFE, as such a depth of 5.0 m has been assumed for the proposed subdrain system.
- The highest groundwater levels measured on-site were approximately 2.1 to 3.5 m below existing grade (Local elevation 116.99 to 118.16 metres).
- Based on the soil encountered during the borehole drilling program a conservation hydraulic conductivity of 5.0 x 10^{-7} m/s has been applied to the entire site.
- Based on the preliminary design drawings the excavation dimensions are assumed to be 135 m by 98 m.

5.2.2 Radius of Influence

The ROI for the permanent dewatering is based on the empirical Copper-Jacob Equation. Similar to the Sichardt equation this equation is used to predict the distance at which the drawdown resulting from pumping is negligible.

$$R_0 = R_{cj} + r_e$$

Where:

R_{cj} = $\sqrt{2.25Dt}$

D = Aquifer Thickness (m)

t = Duration (s)

r_e = $\frac{a+b}{\pi}$

a+b = Length and Width (m)

The ROI calculation is a conservative methodology and is calculated based on the assumption of active pumping during long-term dewatering; however, it should be noted that there will be no active pumping during long-term dewatering. The foundation drains will be constructed below the

floor slab and/or near the foundation and the groundwater would passively drain into these sub drains and discharge directly to sumps. Due to the nature of overburden material, the groundwater will flow through the natural gradient that exists on the site and passively flow into the foundation sub-drains and will not be actively pumped.

Based on the Copper-Jacob equation, the ROI is approximately 85 m, calculation details are provided in Appendix F.

5.2.3 Long-Term Perimeter Drain Flow Rate Estimate

The Dupuit-Forcheimer equation for radial flow from an unconfined aquifer for a fully penetrating excavation was used to obtain a flow rate estimate, and is expressed as follows:

$$Q_w = \frac{\pi K(H^2 - h^2)}{In(\frac{R_0}{r_e})}$$

Based on the assumptions provided in this report (outlined in Section 5.1 and 5.2), the results of the long-term discharge volume estimate are summarized below and detailed calculations are provided in Appendix F:

Location	Long-Term Peak Flow Rate (L/day)	Notes
Flow into sub-drain after initial dewatering stages	14,100	Long term sub-drain flow value rounded based on Dupuit-Forcheimer's equation. A Safety factor of 2 was used.

The maximum flow rate estimates represent short term events and are not indicative of long-term continuous contributions to the drainage system. Intermittent cycling of sump pumps and seasonal fluctuation in groundwater regimes should be considered for pump specifications. Given that the predicted dewatering volume does not exceed the 50,000 L/day limit, a PTTW is not required.

It should be noted that the dewatering estimates provided in this report are based on the proposed building information available at this time.

If the groundwater encountered during long-term dewatering is discharged to the City of Mississauga and/or Region of Peel Sanitary and Combined sewer, no treatment will likely be required; however, discharge directed to the City of Mississauga and/or Region of Peel Storm Sewers will likely require treatment.

5.3 Dewatering Impact Assessment

5.3.1 Impacts to Nearby Groundwater Users

The site lies within an urban area of Mississauga, based on the MECP Water Well Record database, no supply water wells were identified. Given the area is serviced by municipal system, no private well water user is expected. There are no potential impacts to nearby groundwater users due to construction dewatering or long-term dewatering is expected.

5.3.2 Natural Environment

Little Etobicoke Creek lies approximately 400 m north of the site, which is outside of the anticipated ROI. Further the dewatering will be of short duration and the water removed will ultimately return to watershed after treatment and discharge. Therefore, it is not anticipated that the construction dewatering will negatively impact the groundwater flow to Little Etobicoke Creek and/or Etobicoke Creek.

5.3.3 Land Stability

Based on the borehole results and groundwater level measurements, the groundwater table is at approximately Elev. 116.9 to 118.2 m, or about 2.1 to 3.5 metres below grade, and is entirely within the bedrock formation. There will be no drawdown of groundwater from the soil overburden, and therefore no increases in effective stress within the soil from reducing the pore water pressures. The bedrock will not settle due to dewatering activities. There will be no settlement related impacts to nearby lands, structures, or buried utilities.

Another cause of significant dewatering related settlement is due to pumping of fines through the system. It is imperative that any dewatering systems shall be designed and installed adequately to ensure no soil is conveyed through the system. Sufficient filtering techniques are incorporated at the entry point to avoid migration fines in the pumping/dewatering system.

5.4 Monitoring, Mitigation, and Treatment Plan

5.4.1 Dewatering Discharge Treatment and Quality Monitoring

Based on the results of the water quality analyses of the discharge, the following dewatering discharge options can be selected in the order of preference:

i. Discharge to existing storm sewers, provided water quality results comply with the applicable Storm Sewer Use By-Law Criteria.
ii. Discharge to existing sanitary sewers, provided water quality results comply with the applicable Sanitary Sewer Use By-Law Criteria.
iii. Shut-down and re-evaluate treatment options.

The monitoring plan for discharge to the surface and/or storm is outlined on Table G-1.

The monitoring will be implemented both during a trial dewatering and during construction. The trial dewatering will be conducted for a short period of time once the dewatering system and sediment control facilities (filtration bags, decantation tanks, sedimentation ponds, or the like) are installed to obtain a representative water sample from the outflow of the sediment control facility (the “discharge”) for chemical analysis. The results of this water quality analysis will provide guidance in the selection of a discharge option and the discharge treatment requirements during construction dewatering.

5.4.2 Settlement Monitoring

Based on the borehole results and groundwater level measurements, the groundwater table is at approximately Elev. 116.9 to 118.2 m, or about 2.1 to 3.5 metres below grade, and is entirely within the bedrock formation. There will be no drawdown of groundwater from the soil overburden, and therefore no increases in effective stress within the soil from reducing the pore water pressures. The bedrock will not settle due to dewatering activities. There will be no settlement related impacts to nearby lands, structures, or buried utilities.

Another cause of significant dewatering related settlement is due to pumping of fines through the system. It is imperative that any dewatering systems shall be designed and installed adequately to ensure no soil is conveyed through the system. Sufficient filtering techniques are incorporated at the entry point to avoid migration fines in the pumping/dewatering system.

Settlement monitoring recommendations are outlined in Table G-1, appended.

5.4.3 Discharge Rate Monitoring

The total groundwater volume pumped should be measured by the dewatering contractor using a flow measuring device, and the records are to be reported to the MECP through the water taking reporting system (WTRS).

The Contractor on behalf of Client will maintain a record of all water takings. This record will include the dates and duration of water takings, and the total measured volume of water pumped per day for each day that water is taken and will be updated and reported to the Client once each week. The Client will keep all the required records up to date and available at or near the site of the water taking and will produce the records immediately for inspection by a Provincial Officer upon his or her request.

5.4.4 Remedial Dewatering Activities

The dewatering contractor is responsible for finalizing and implementing the discharge plan including information such as the exact discharge location, erosion control methods, method of conveyance, treatment systems, temperature of the discharged groundwater, etc. It is the contractor’s responsibility to implement a treatment system to ensure that discharged groundwater meets the applicable Sewer Use By-Law Criteria for the necessary parameters. This may be done by examining the hydrogeologic conditions in a test pit (and/or a full-range pumping test by the dewatering subcontractor).

The dewatering discharges should follow the best management practices, including sediment and erosion control measures, removal of suspended solids by a decanting tank, as well as a water quality and quantity control monitoring programs, as mentioned earlier.

The contractor should be aware that the purpose of the dewatering system is to maintain stable excavation slopes and dry working conditions during excavation. Short step pumping tests are recommended in order to confirm the aquifer conditions and the efficiency of each well or trench, if used.

The extent and details of the dewatering scheme (trench or well dimensions, spacing, pump levels, screen size and wick gradation) are left solely to the contractor's discretion to achieve the performance objectives for maintaining stable slopes and dry working conditions and will be based on his/her own interpretation and analysis of site conditions, equipment, experience, and plant efficiency. The contractor should also appreciate that additional dewatering means and modifications may be required as variations in site conditions are encountered.

Once construction sequences are finalized, the contractor will identify the discharge locations, including UTM coordinates, a site plan, and the method of conveyance for normal operating conditions and also in the event of a 100-year storm event. This will include considerations to ensure temperature of the groundwater will not be increased during conveyance. The contractor will provide details on the erosion and sediment control measures that will be used, such as filtration, silt fences, check dams, etc. Additional ESC supplies should be kept on the site for immediate remediation of any issues noted during construction, and restoration plans (e.g., re-vegetation) should also be provided by the contractor. Any material retained by the ESC measures (e.g., sediments) will be disposed once construction is completed.

Any application submitted to the MECP for renewal or technical amendment of the permit will be accompanied by all records required by the conditions of the permit. The records will be interpreted by a qualified person and submitted in the form of a report.

6. Limitations and Conclusions

6.1 Limitations

The recommendations and comments provided are necessarily on-going as new information of underground conditions becomes available. More specific information with respect to the conditions between samples, or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during excavation operations. Consequently, conditions not observed during this investigation may become apparent. Should this occur, GEI should be contacted to assess the situation and additional testing and reporting may be required.

GEI should be retained for a general review of the final design drawings and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, GEI will assume no responsibility for interpretation of the recommendations in the report.

The comments given in this report are intended only for the guidance of the design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

This report was prepared by GEI for the account of Dundix Realty Holdings. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. GEI accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

6.2 Conclusions

It is recognized that municipal/regional governing bodies, in their capacity as the planning and building authority under Provincial statues, will make use of and rely upon this report, cognizant of the limitations thereof, both as are expressed and implied.

We trust this report is complete within our terms of reference, and the information presented is sufficient for your present purposes. If you have any questions, or when we may be of further assistance, please do not hesitate to contact our office.

Yours truly,

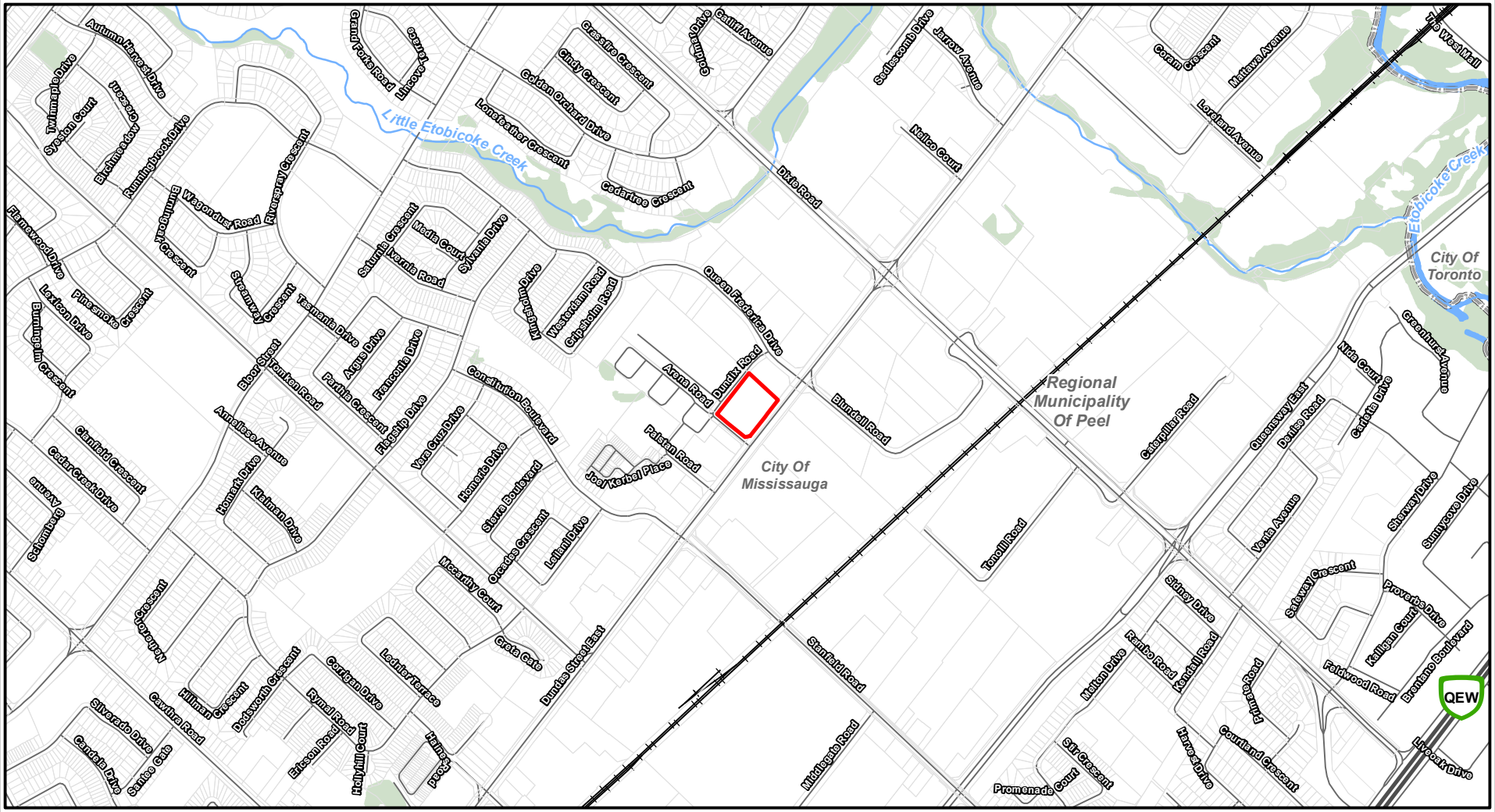
GEI Consultants.

June 30, 2022

Alicia Kimberley, MSc., P.Geo.
Geoenvironmental and Hydrogeological Practice Lead

Alexander Winkelmann, P.Eng.
Geotechnical and Earth Sciences Manager

Figures



Legend

Site Boundary | Highway | Waterbody
Parcels | Road | Wooded Area
Railway | Watercourse

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Mississauga Parcel data (approximate), City of Mississauga via Arcgis Online (May 2022).

0 190 380 m

1:15,000

N

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

Dundix Realty Holdings

GEI Consultants

SITE LOCATION PLAN

Project 2202029 | June 2022 | Fig. 1

Legend

- Approximate Site Boundary
- Borehole/Monitoring Well Location
- Cross Section Location

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Orthoimagery © First Base Solutions, 2022. Imagery taken in 2021.

0 10 20 m

1:1,000

N

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

Dundix Realty Holdings

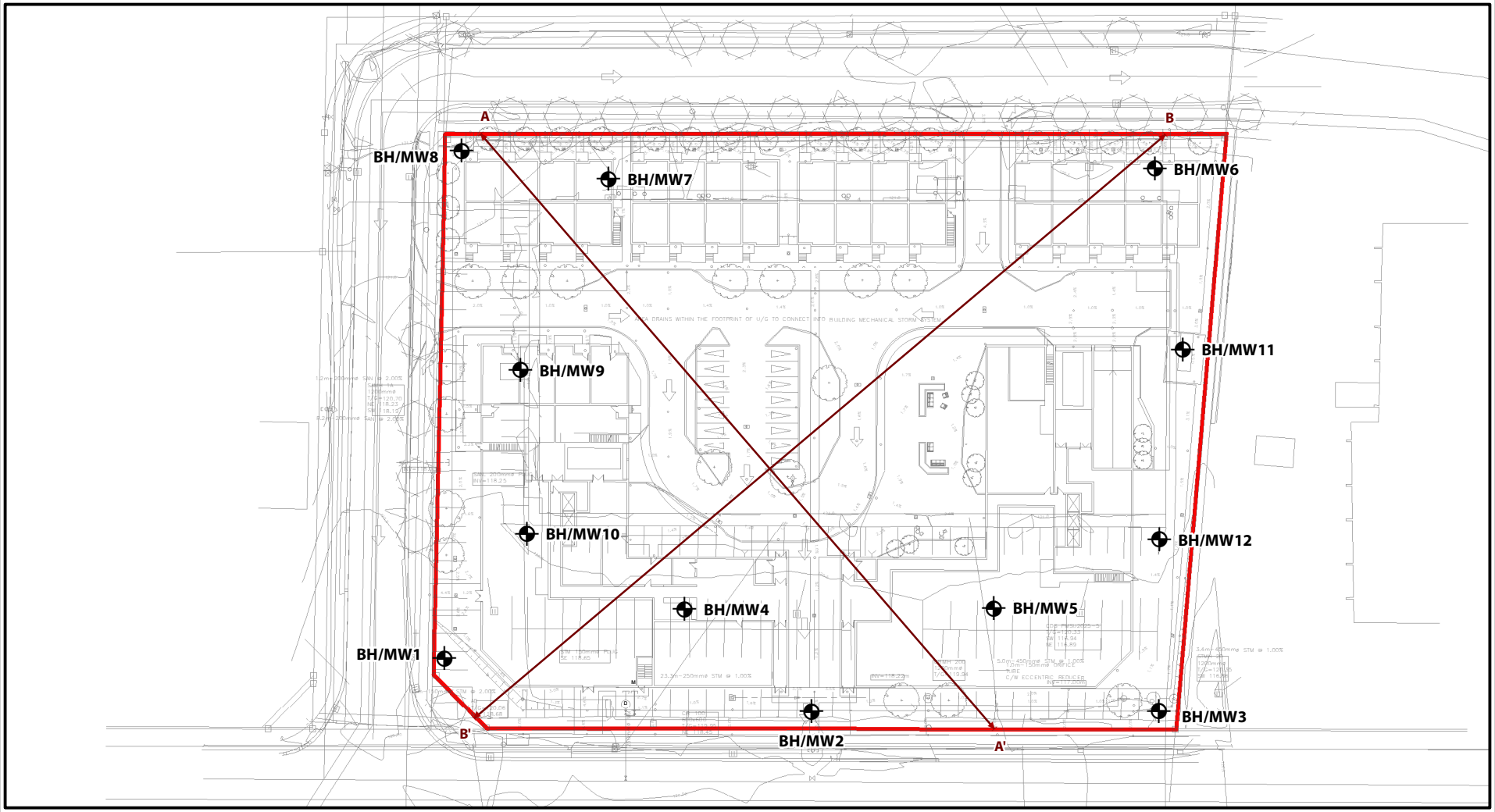
GEI Consultants

Project 2202029

BOREHOLE/MONITORING WELL LOCATION PLAN (AERIAL)

June 2022

Fig. 2A



Legend

- Approximate Site Boundary
- Borehole/Monitoring Well Location
- Cross Section Location

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Grading and Servicing Plan, Stantec (2022-06-29)

0 10 20 m

1:1,000

N

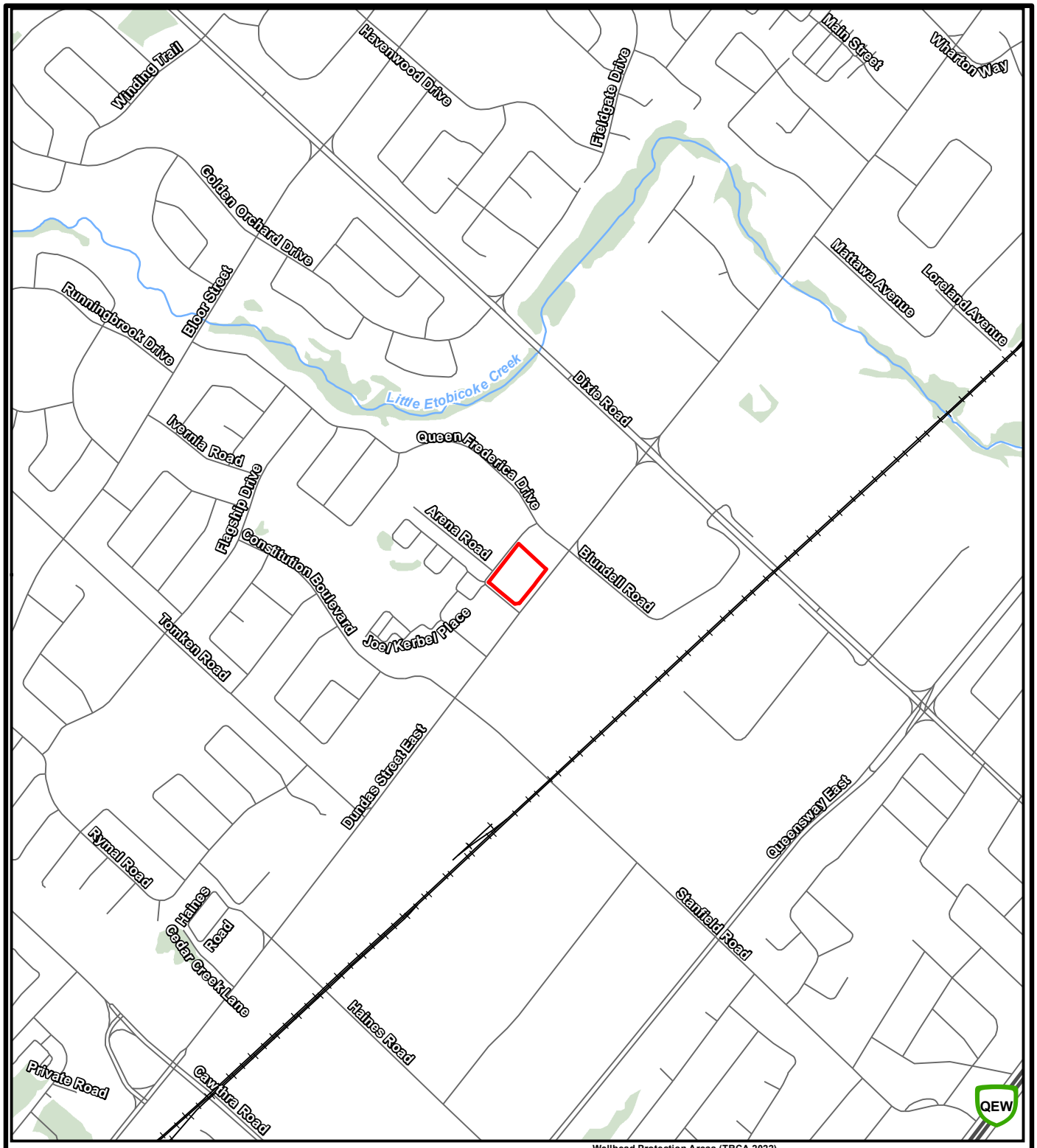
Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

Dundix Realty Holdings

GEI Consultants

BOREHOLE/MONITORING WELL LOCATION PLAN (CONCEPT PLAN)

Project 2202029 | June 2022 | Fig. 2B



NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. TRCA data from MECP Source Protection Information Atlas Image (Approximate). Accessed June 2022.

Legend

- Site Location
- Highway
- Road
- Railway
- Watercourse
- Wooded Area

Wellhead Protection Areas (TRCA 2022)

Zone

- A
- B
- C
- C1
- D
- Q1
- Q2

- No Wellhead Protection Areas Within Map Extents -

N

0 150 300 m

1:15,000

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

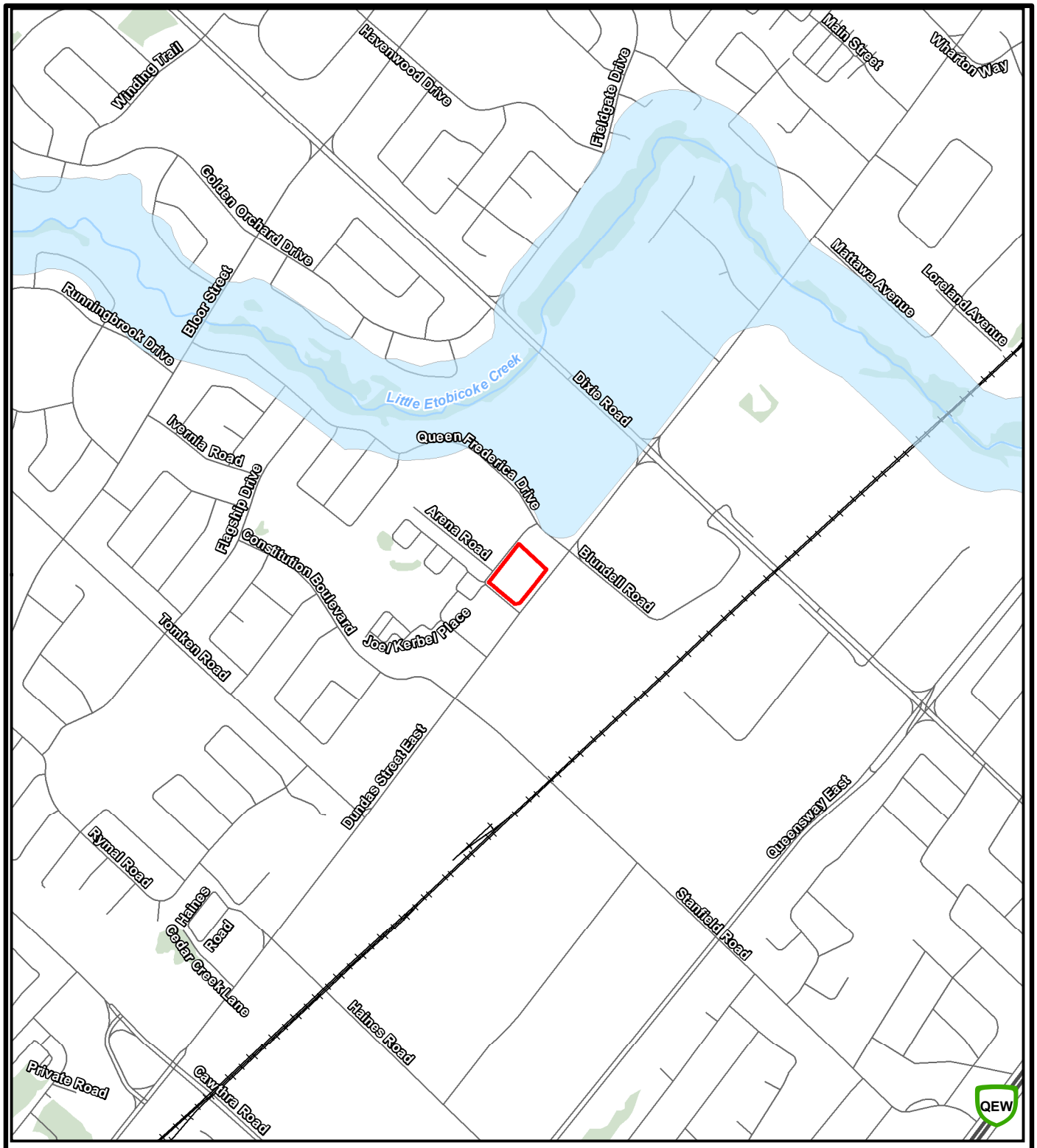
Dundix Realty Holdings

GEI Consultants

Project 2202029

WELLHEAD PROTECTION AREA

June 2022 Fig. 3



NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. TRCA data from MECP Source Protection Information Atlas Image (Approximate). Accessed June 2022.

Legend

- Site Location
- Highway
- Road
- Railway
- Watercourse
- Wooded Area

Intake Protection Zone (TRCA 2022)

Zone
- 1
- 2
- 3

N

0 150 300 m

1:15,000

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

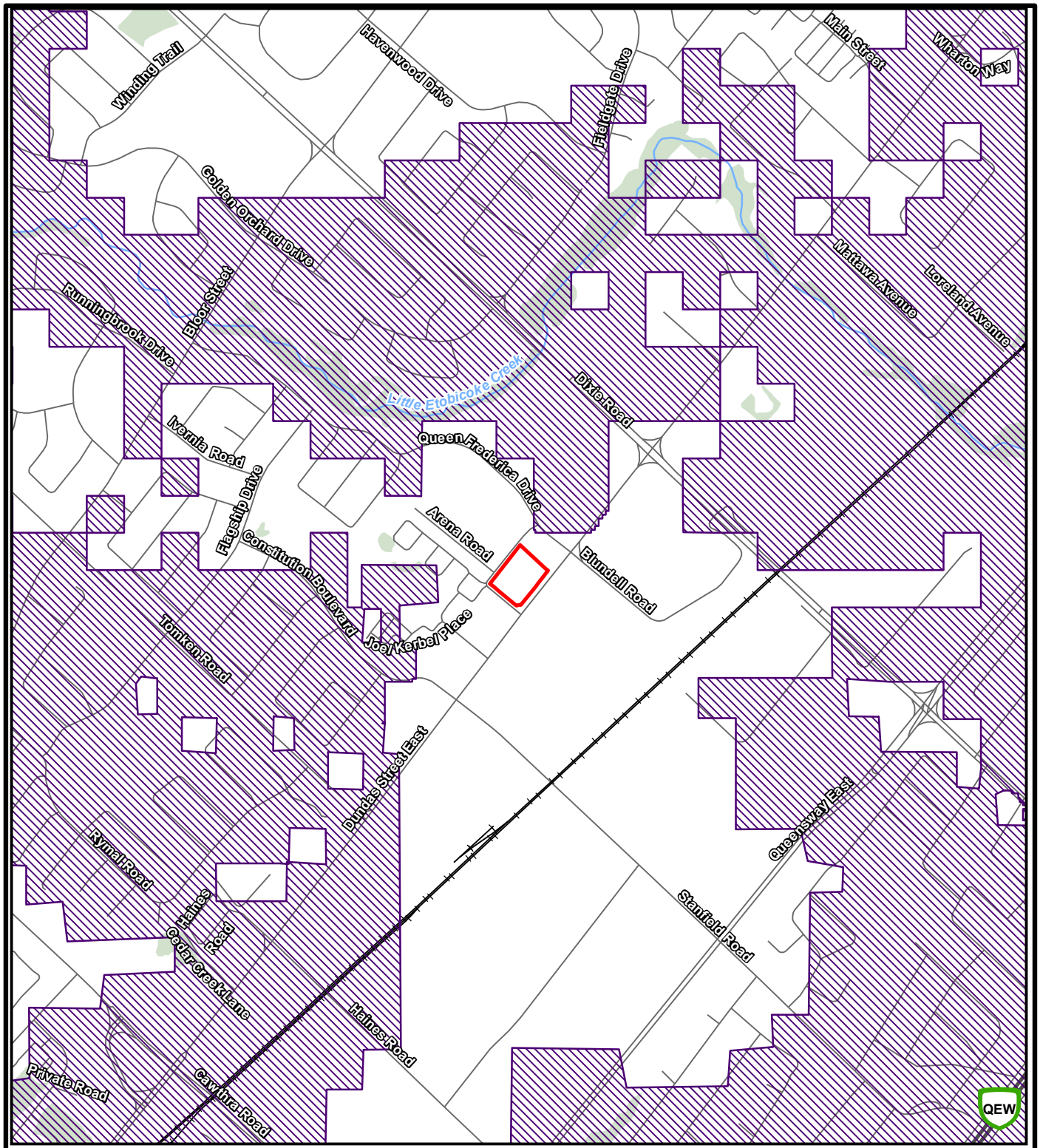
Dundix Realty Holdings

GEI Consultants

Project 2202029

INTAKE PROTECTION ZONES

June 2022 Fig. 4



NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. TRCA data from MECP Source Protection Information Atlas Image (Approximate). Accessed June 2022.

Legend

- Site Location
- Highway
- Road
- Railway
- Watercourse
- Wooded Area
- Highly Vulnerable Aquifer (TRCA 2022)

N

0 150 300 m

1:15,000

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

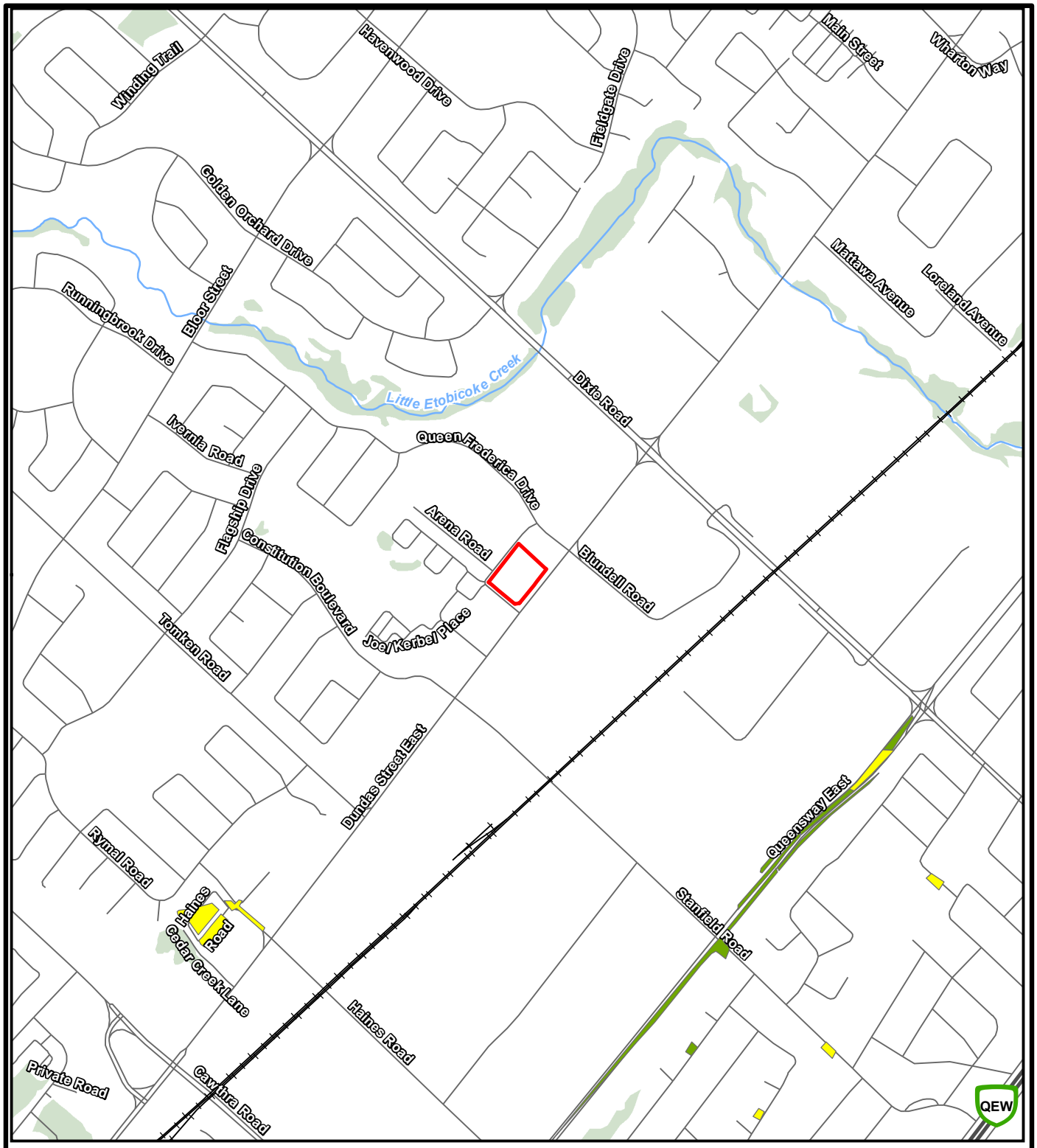
Dundix Realty Holdings

GEI Consultants

Project 2202029

HIGHLY VULNERABLE AQUIFERS

June 2022 Fig. 5



NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. TRCA data from MECP Source Protection Information Atlas Image (Approximate). Accessed June 2022.

Legend

- Site Location
- Highway
- Road
- Railway
- Watercourse
- Wooded Area

Significant Groundwater Recharge Area (TRCA 2022)

Zone
- 2
- 4
- 6

N

0 150 300 m

1:15,000

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

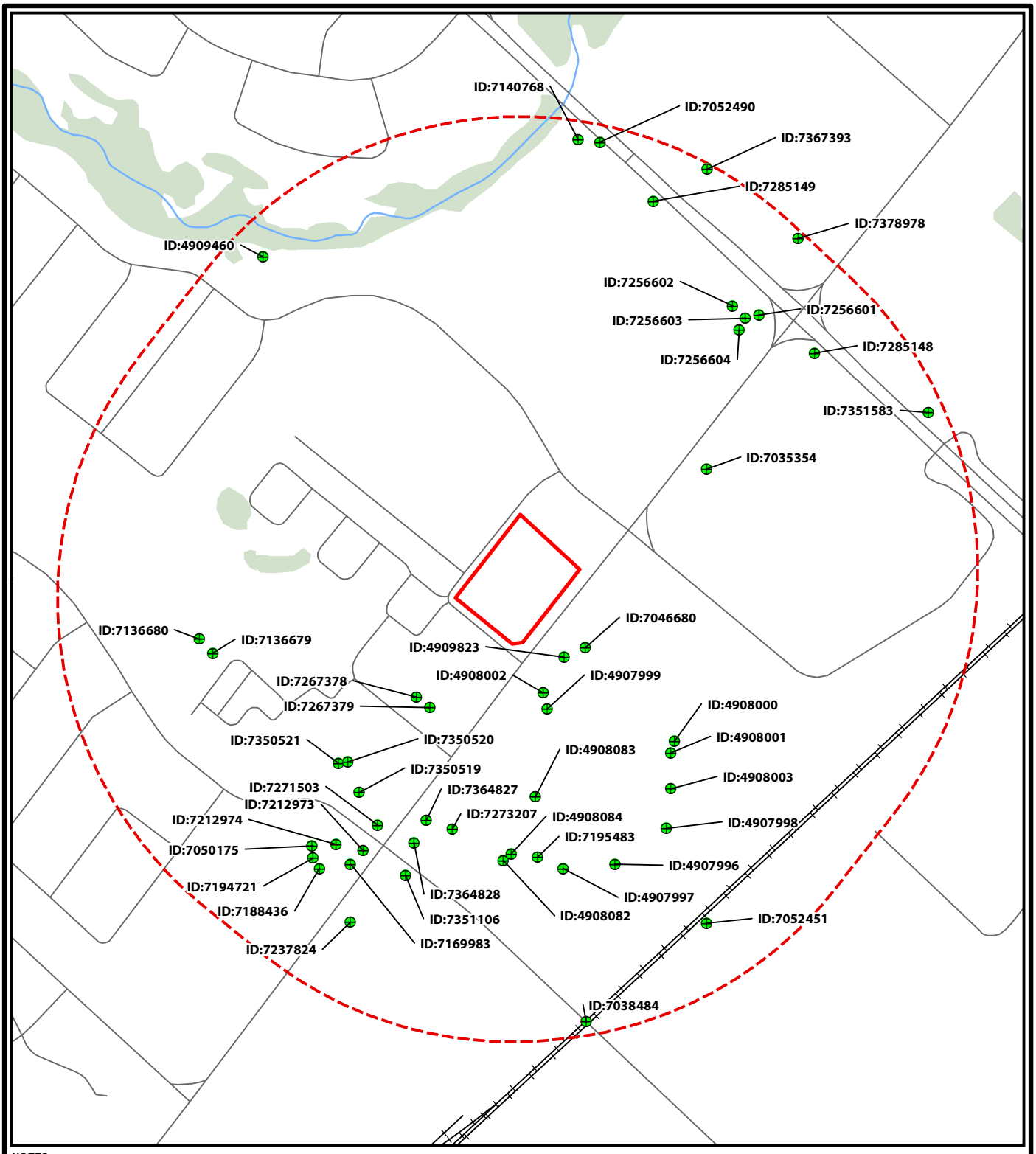
Dundix Realty Holdings

GEI Consultants

Project 2202029

SIGNIFICANT GROUNDWATER RECHARGE AREAS

June 2022 Fig. 6



NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.

Legend

- Site Location
- Site Location +500m
- MECP Well Water Records Within 500m of Site Location
- Road
- Railway
- Watercourse
- Wooded Area

N

0 70 140 m

1:7,000

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

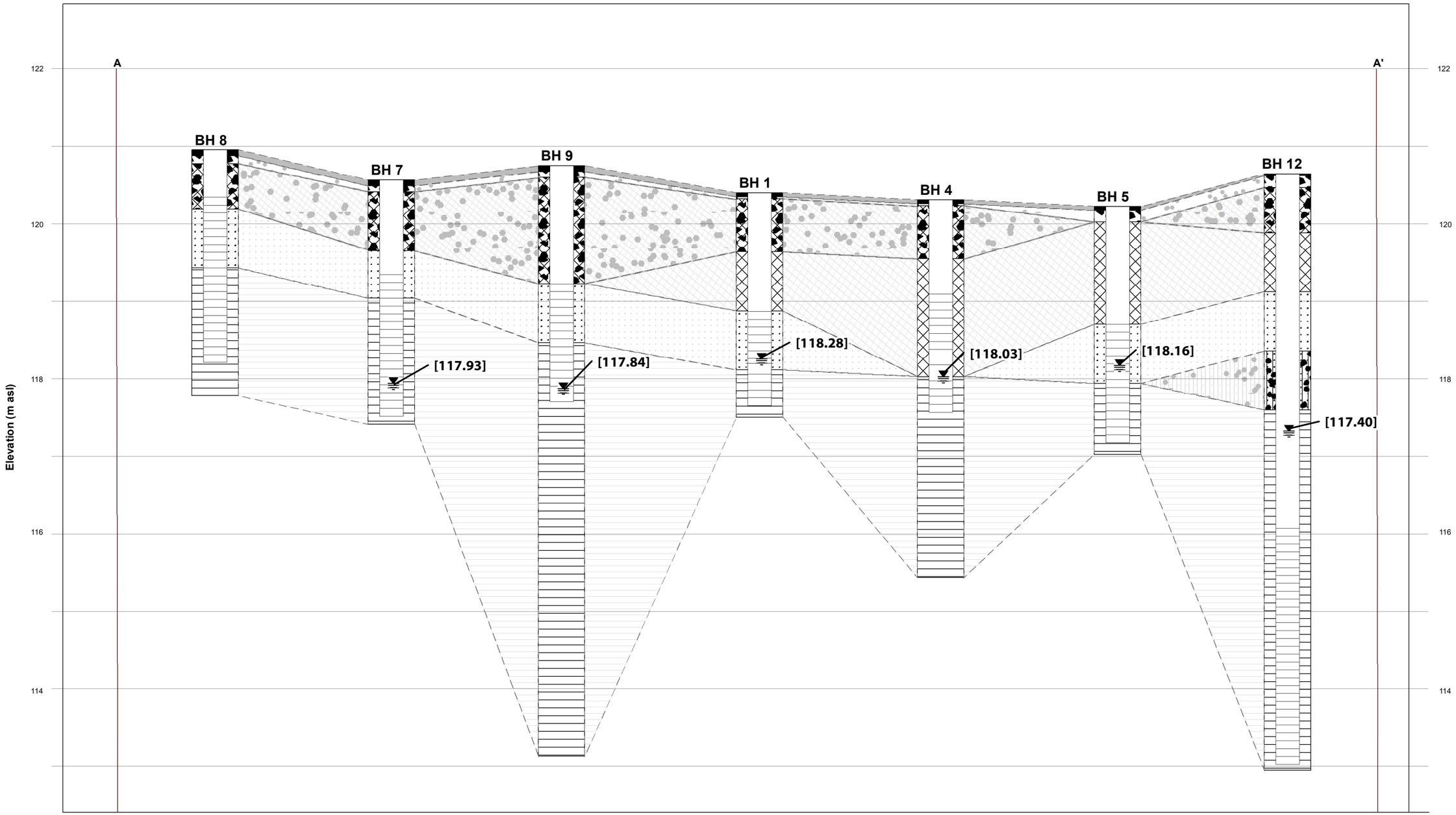
Dundix Realty Holdings

GEI Consultants

Project 2202029

MECP WELL RECORD LOCATIONS

June 2022 Fig. 7



NOTES:
1. Subsurface conditions known only at borehole locations.
2. Horizontal distances are not to scale.

Legend

Water Level in Monitoring Well
[xx.xx] Water Levels (masl) Measured 2022-06-01

Strata

- Paving
- Granular
- Granular Fill
- Fill
- Sandy Silt Glacial Till
- Sand
- Shale Bedrock

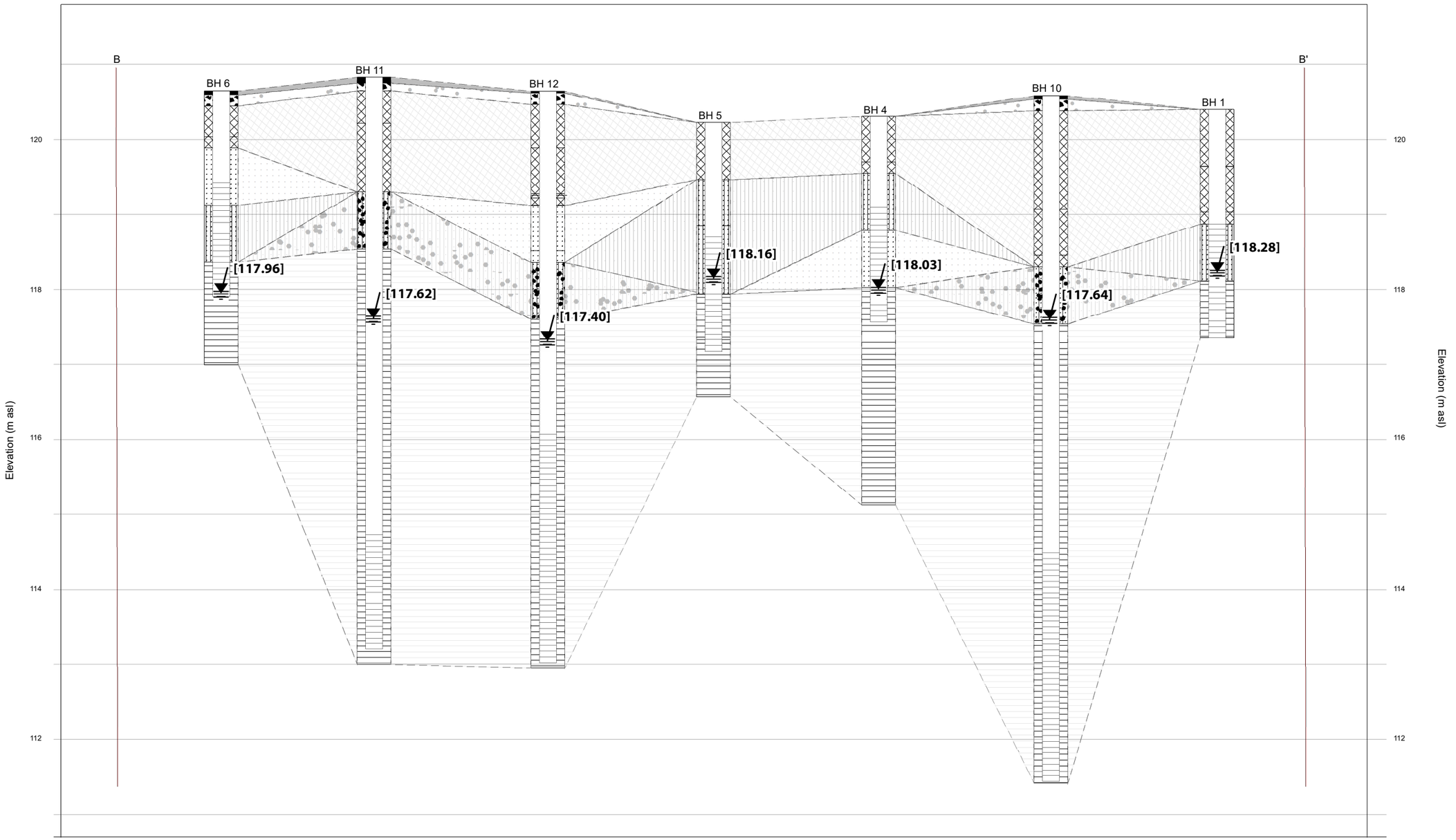
Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

Dundix Realty Holdings

GEI Consultants

GEOLOGICAL CROSS SECTION A-A'

Project 2202029 | June 2022 | Fig. 8



NOTES:
1. Subsurface conditions known only at borehole locations.
2. Horizontal distances are not to scale.

Legend

Water Level in Monitoring Well
[xx.xx] Water Levels (masl) Measured 2022-06-01

Strata

- Asphalt
- Granular
- Fill
- Sand to Sandy Silt Glacial Till
- Silty Sand/Sandy Silt
- Sand
- Shale

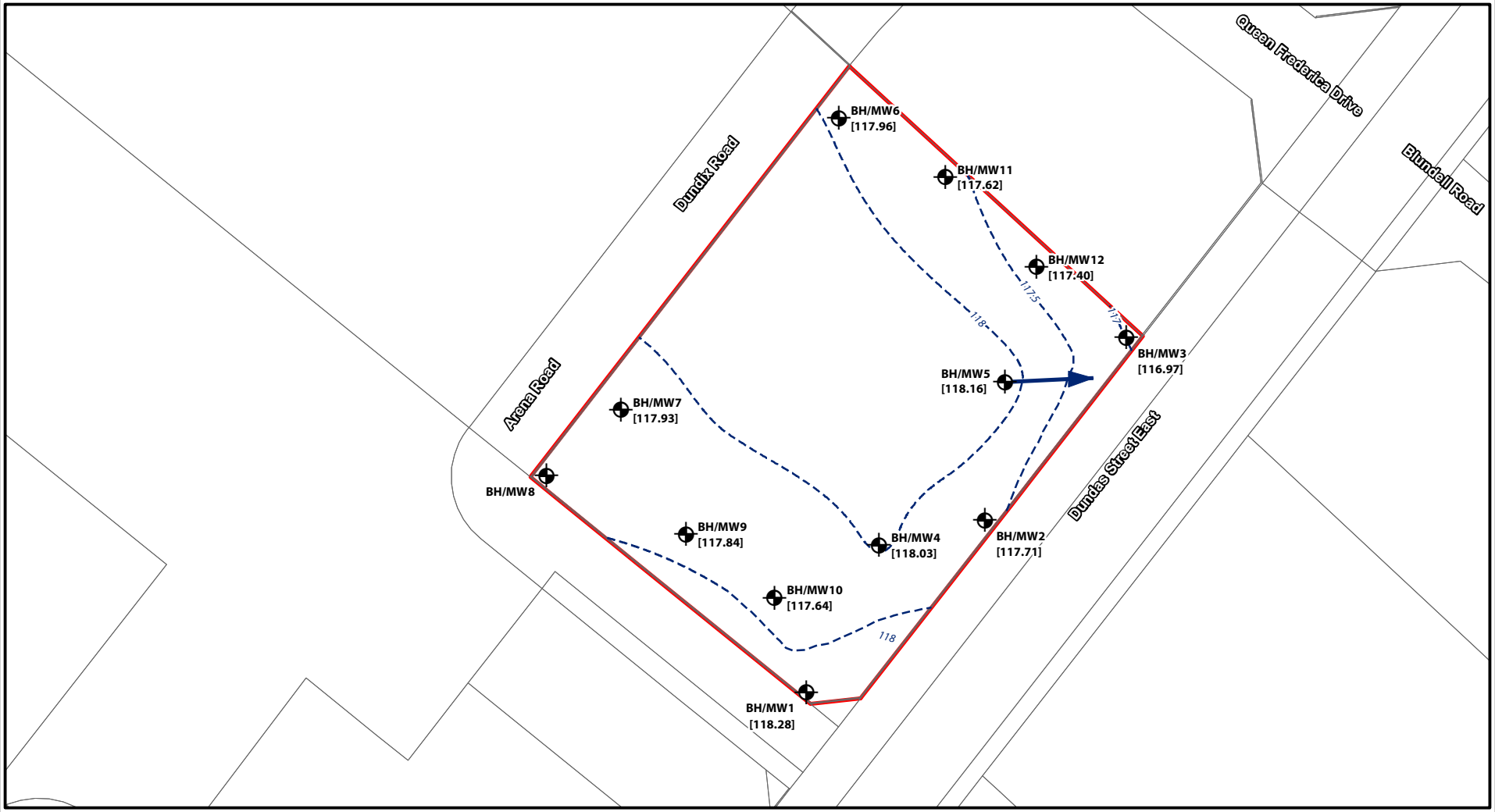
Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

Dundix Realty Holdings

GEI Consultants

GEOLOGICAL CROSS SECTION B-B'

Project 2202029 | June 2022 | Fig. 9



Legend

- Approximate Site Boundary
- Parcels
- Borehole/Monitoring Well Location
- [xx.xx] Water Level (m asl)
- Groundwater Contour
- Interpreted Direction of Groundwater Flow

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Mississauga Parcel data (approximate), City of Mississauga via Arcgis Online (May 2022).

0 10 20 m

1:1,500

N

Hydrogeological Investigation
1225 Dundas St. E
Mississauga, Ontario

Dundix Realty Holdings

GEI Consultants

GROUNDWATER CONTOUR PLAN

Project 2202029 | June 202 | Fig. 10

Appendix A

MECP Water Well Records

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
MISSISSAUGA CITY	17 614165 4829261 W	2006/07 7241	1.5				0005 5	7035354 (Z51865) A046069 A	BRWN GRVL SAND LOOS 0004 BRWN SAND SILT SOFT 0008 GREY SHLE ROCK HARD 0010
MISSISSAUGA CITY	17 613528 4829048 W	2009/11 7241	0.75			MT	0010 5	7136680 (Z106595) A089035	BRWN LOAM DNSE 0001 BRWN GRVL FILL DNSE 0004 GREY CLAY GRVL DNSE 0014 GREY SHLE DNSE 0015
MISSISSAUGA CITY	17 613545 4829030 W	2009/11 7241	0.75			MT	0008 5	7136679 (Z106596) A056701	BRWN LOAM DNSE 0001 BRWN GRVL FILL DNSE 0004 GREY GRVL SAND DNSE 0012 GREY CLAY SHLE DNSE 0013
MISSISSAUGA CITY	17 613671 4828773 W	2012/12 6607						7194721 (C19177) A141645 P	
MISSISSAUGA CITY	17 613953 4828774 W	2012/11 6946						7195483 (C19552) A136749 P	
MISSISSAUGA CITY	17 613679 4828760 W	2012/04 6607						7188436 (C17941) A054706 P	
MISSISSAUGA CITY	17 613700 4828790 W	2013/10 7215						7212974 (C23517) A141645 P	
MISSISSAUGA CITY	17 613734 4828782 W	2013/10 7215						7212973 (C23513) A141645 P	
MISSISSAUGA CITY	17 613718 4828765 W	2011/09 7215	2				0020 5	7169983 (Z133755) A117968	BRWN FILL 0007 GREY SHLE LMSN 0020
MISSISSAUGA CITY	17 613718 4828692 W	2014/12 6946						7237824 (C24522) A159012 P	
MISSISSAUGA CITY	17 613801 4828975 W	2016/06 7241	2			MT	0008 10	7267378 (Z233356) A185139	BLCK ---- 0002 BRWN SAND SILT 0008 GREY SHLE 0018
MISSISSAUGA CITY	17 613818 4828962 W	2016/06 7241	2			MT	0010 10	7267379 (Z233357) A185145	BRWN LOAM 0004 BRWN SAND SILT 0008 GREY SHLE 0020
MISSISSAUGA CITY	17 614206 4829436 W	2015/11 7241	2			MT	0005 10	7256604 (Z218010) A180462	BRWN FILL LOOS 0002 BRWN SAND SILT LOOS 0005 GREY SHLE DNSE 0015
MISSISSAUGA CITY	17 613846 4828809 W	2016/09 7241	2			MT	0012 10	7273207 (Z209815) A181747	BLCK ---- SOFT 0000 BRWN FSND SILT SOFT 0022
MISSISSAUGA CITY	17 613752 4828814 W	2015/07 7215						7271503 (C29440) A182929 P	
MISSISSAUGA CITY	17 613729 4828855 W	6946	2			MO	0003 10	7350519 (Z318070) A262898	BLCK SILT SILT 0010 GREY SHLE SHLE 0013

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
MISSISSAUGA CITY	17 613715 4828894 W	6946	2			MO	0010 10	7350520 (Z318068) A285905	BRWN SILT SILT 0010 GREY SHLE SHLE 0020
MISSISSAUGA CITY	17 613703 4828892 W	6946	2			TH	0010 10	7350521 (Z318069) A285903	BRWN SILT SILT 0010 GREY SHLE SHLE 0020
MISSISSAUGA CITY	17 613787 4828751 W	2019/08 7437						7351106 (C43816) A258469 P	
MISSISSAUGA CITY	17 613813 4828820 W	2020/06 7241	2			MT	0012 10	7364827 (Z338051) A295+71	BRWN SAND 0004 BRWN SAND SILT 0014 GREY SAND SILT 0022
MISSISSAUGA CITY	17 613798 4828792 W	2020/06 7241	2			MT	0013 10	7364828 (Z338050) A295714	BRWN SAND FILL 0004 BRWN SAND SILT 0018 GREY SAND SILT 0023
MISSISSAUGA CITY	17 614165 4828691 W	2007/10 7241	2.27					7052451 (Z63666) A	
MISSISSAUGA CITY	17 613670 4828788 W	2007/08 6607	2	FR 0010		NU		7050175 (Z60444) A054706	BRWN SAND SILT 0005 GREY SHLE WTHD 0015
MISSISSAUGA CITY	17 614013 4829037 W	2007/05 7215	1			NU	0003 5	7046680 (Z70398) A055210	
MISSISSAUGA CITY 01 007	17 613986 4829025 W	2005/06 7075		5		NU		4909823 (Z29102) A025482	BRWN SAND SILT LYRD 0005 GREY CLAY SILT HARD 0007
MISSISSAUGA CITY DS 01 007	17 613920 4828778 W	1996/01 6902	2	FR 0005		NU	0003 4	4908084 (159911)	BLCK UNKN 0000 GREY GRVL SNDS 0001 BRWN FSND LOOS 0005 GREY FSND WBRG LOOS 0006 GREY SHLE 0007
MISSISSAUGA CITY DS 01 007	17 614120 4828860 W	1995/04 6902	2	UK 0005		NU	0008 8	4908003 (159876)	BRWN FSND 0005 GREY SHLE 0014
MISSISSAUGA CITY DS 01 007	17 614050 4828765 W	1995/04 6902	2	UK 0004		NU	0004 5	4907996 (159878)	BRWN SILT SNDY CSND 0006 GREY SHLE 0009
MISSISSAUGA CITY DS 01 007	17 613910 4828770 W	1996/01 6902	2	FR 0005		NU	0002 4	4908082 (159912)	BRWN FSND LOOS 0006 GREY SHLE HARD 0006
MISSISSAUGA CITY DS 01 007	17 613960 4828980 W	1995/04 6902	2			NU	0007 5	4908002 (159875)	BRWN FSND SILT 0009 GREY SHLE 0012
MISSISSAUGA CITY DS 01 007	17 613985 4828760 W	1995/04 6902	2	UK 0003		NU	0004 5	4907997 (159877)	BRWN SILT SNDY CSND 0006 GREY SHLE 0009
MISSISSAUGA CITY DS 01 007	17 613950 4828850 W	1996/01 6902	2	FR 0007		NU	0004 4	4908083 (159905)	BLCK UNKN 0003 BRWN FSND LOOS WBRG 0008 GREY SHLE 0009
MISSISSAUGA CITY DS 01 007	17 614120 4828905 W	1995/04 6902	2	UK 0002		NU	0003 5	4908001 (159891)	BRWN FSND 0005
MISSISSAUGA CITY DS 01 007	17 614115 4828810 W	1995/04 6902	2	UK 0004		NU	0005 5	4907998 (159860)	BRWN FSND SILT 0007 GREY SHLE 0010
MISSISSAUGA CITY DS 01 007	17 613965 4828960 W	1995/04 6902	2	UK 0001		NU	0006 5	4907999 (159889)	BRWN FSND SAND 0008 GREY SHLE 0011

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
MISSISSAUGA CITY DS S 01 007	17 614125 4828920 W	1995/04 6902	2	UK 0006		NU	0004 5	4908000 (159890)	BRWN FSND 0006 GREY SHLE 0009

Appendix B

Borehole Logs

RECORD OF BOREHOLE No. 1

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829045** Date Started: **May 24/22**
Reviewed By: **AW** Easting: **613929** Date Completed: **May 24/22**

Lithology Plot	DESCRIPTION (Geodetic)	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	0.0 / 120.4					0	120
	ASPHALT: 50 mm (0.1 / 120.3)						
	GRANULAR: 75 mm	SS	1	100	12		
	GRANULAR FILL: Gravelly sand, some silt, compact, dark brown, moist (0.8 / 119.6)						
	FILL: Clayey silt with granular inclusions, some sand, trace organics, loose to firm, black, moist	AS	2	0	4	1.2	118.8
	1.5 / 118.9						
	SAND: Some silt, trace gravel, loose, brown, moist	SS	3	100	8		
	2.3 / 118.1						
	GEORGIAN BAY FORMATION SHALE - - - Highly weathered - - -	SS	4	100	76	2.4	117.6
	2.9 / 117.5						
	Borehole Terminated at 2.9 m						

FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40
12
4
8
76

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
◇ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL LL
○ Water Content (%)
10 20 30 40
8
27
20
13

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
1	79	17	3

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 2.2 m.
Groundwater Elevation: 118.2 m

RECORD OF BOREHOLE No. 2

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829090** Date Started: **May 25/22**
Reviewed By: **AW** Easting: **613965** Date Completed: **May 25/22**

Geodetic	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
0.0 / 120.5						0	
0.1 / 120.4	ASPHALT: 75 mm						
0.2 / 120.3	GRANULAR: 125 mm	SS	1	65	12		120
	GRANULAR FILL: Sand, some gravel, some silt, compact, brown, moist						
0.8 / 119.7	FILL: Silty sand, trace clay, trace gravel, loose, brown, moist	SS	2	70	6	1.2	
1.5 / 119.0	SAND: Trace to some silt, compact, brown, moist	SS	3	100	12		118.8
2.3 / 118.2	GEORGIAN BAY FORMATION SHALE - - - Highly Weathered - - -	SS	4	100	19	2.4	
3.1 / 117.4	- - - Weathered - - -	SS	5	100	100+		117.6
	Borehole Terminated at 3.1 m						

FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40
12, 6, 12, 19, 100+

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
◇ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL LL
○ Water Content (%)
10 20 30 40
12, 18, 14, 5, 8

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
3	71	21	5

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 2.8 m.
Groundwater Elevation: 117.7 m

RECORD OF BOREHOLE No. 3

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829137** Date Started: **May 25/22**
Reviewed By: **AW** Easting: **613999** Date Completed: **May 25/22**

Geodetic	Description	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	Depth (m)	Elevation (m)
0.0 / 120.4						0	120
0.1 / 120.3	ASPHALT: 75 mm						
0.2 / 120.2	GRANULAR: 100 mm	SS	1	65	10		
	GRANULAR FILL: Sand and gravel, some silt, compact, brown, moist					1.2	118.8
0.8 / 119.6	FILL: Sand and silt, trace to some clay, trace gravel, loose to very loose, blackish brown to greyish brown, moist	SS	2	85	7		
	- - - Some gravel - - -	SS	3	50	3		
2.3 / 118.1	SANDY SILT GLACIAL TILL: Some gravel, some clay, cobbles and boulders, firm to stiff, brownish grey, moist	SS	4	40	8	2.4	117.6
3.0 / 117.4	GEORGIAN BAY FORMATION SHALE - - - Weathered - - -	SS	5	80	56	3.6	116.4
4.6 / 115.8	Borehole Terminated at 4.6 m	SS	6	100	100+		

FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
◇ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL LL
○ Water Content (%)
10 20 30 40

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
18	25	41	16

Instrumentation Installation

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 3.5 m.
Groundwater Elevation: 116.9 m

RECORD OF BOREHOLE No. 4

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829080** Date Started: **May 25/22**
Reviewed By: **AW** Easting: **613936** Date Completed: **May 25/22**

GEI Consultants

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING		LAB TESTING			COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): × Other Test, + Pocket Penetrometer, ▲ Field Vane (Intact), △ Field Vane (Remolded); 40 80 120 160; Penetration Testing: ○ SPT ● DCPT; 10 20 30 40		△ Combustible Organic Vapour (ppm), ▲ Combustible Organic Vapour (%LEL), ◇ Total Organic Vapour (ppm); 100 200 300 400; Atterberg Limits PL LL; ○ Water Content (%); 10 20 30 40		Instrumentation Installation	GR	SA	SI	CL
	Geodetic 0.0 120.3 / 0.1 120.2					0	120									
	ASPHALT: 50 mm															
	GRANULAR: 75 mm	SS	1	75	17			17		7						
	GRANULAR FILL: Sand, some gravel, trace to some silt, compact, brown, moist 0.8 119.5															
	FILL: Sand, some silt, some gravel, trace clay, very loose, dark brown, moist	SS	2	55	4	1.2	118.8	4		12						
	2.3 118.0	SS	3	55	3			3		12			16	63	16	5
	GEORGIAN BAY FORMATION SHALE - - - Highly weathered - - -	SS	4	90	100+	2.4	117.6		100+	10						
	- - - Weathered - - -	SS	5	100	100+				100+	7						
						3.6	116.4									
	4.9 115.4	SS	6	100	100+	4.8			100+							
	Borehole Terminated at 4.9 m															

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 2.3 m.
Groundwater Elevation: 118.0 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :60**

RECORD OF BOREHOLE No. 5

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829127** Date Started: **May 25/22**
Reviewed By: **AW** Easting: **613974** Date Completed: **May 25/22**

Geodetic	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	FIELD TESTING (Shear Strength Testing (kPa); Penetration Testing: SPT ○, DCPT ●)	LAB TESTING (Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm); Atterberg Limits PL–LL; Water Content (%))	Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0						0	120				
0.1	ASPHALT: 50 mm										
0.2	GRANULAR: 150 mm										
	FILL: Sandy silt, some clay, trace gravel, compact to very loose, brown, moist	SS	1	100	13			13	12		
		SS	2	100	4	1.2	118.8	4	20		
1.5											
	SAND: Some silt, trace gravel, very dense, brown, moist	SS	3	100	100+			100+	4		
2.3											
	GEORGIAN BAY FORMATION SHALE - - - Highly weathered - - -	SS	4	65	75	2.4	117.6	75	6		
3.2		SS	5	100	100+			100+	17		
	Borehole Terminated at 3.2 m										

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Jun 1/22 at depth of: 2.1 m.
Cave depth after auger removal: Open
Groundwater Elevation: 118.1 m

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :60**
Page: **1 of 1**

RECORD OF BOREHOLE No. 6

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829194** Date Started: **May 26/22**
Reviewed By: **AW** Easting: **613926** Date Completed: **May 26/22**

Geodetic	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	GR	SA	SI	CL
0.0						0					
0.1							120.6				
0.2	ASPHALT: 50 mm						120.5				
	GRANULAR: 125 mm	SS	1	0	10						
	GRANULAR FILL: Gravelly sand, some silt, compact, brown, moist						120				
0.8							119.9				
	SAND: Some gravel, trace silt, trace clay, compact, brown, moist	SS	2	50	27	1.2		17	74	7	2
1.5							119.2				
	SANDY SILT GLACIAL TILL: Some clay, trace gravel, stiff, greyish brown, moist	SS	3	50	9		118.8	7	28	46	19
2.3							118.4				
	GEORGIAN BAY FORMATION SHALE - - - Very highly weathered - - -	SS	4	100	100+	2.4					
3.2	- - - Weathered - - -	SS	5	75	100+		117.6				
	Borehole Terminated at 3.2 m										

FIELD TESTING: Shear Strength Testing (kPa) — Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded); 40 80 120 160. Penetration Testing: SPT, DCPT; 10 20 30 40.

LAB TESTING: Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm); 100 200 300 400. Atterberg Limits: PL, LL. Water Content (%); 10 20 30 40.

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 2.7 m.
Groundwater Elevation: 118.0 m

RECORD OF BOREHOLE No. 7

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829118** Date Started: **May 26/22**
Reviewed By: **AW** Easting: **613870** Date Completed: **May 26/22**

Geodetic	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
0.0 / 120.6						0	
0.1 / 120.5	ASPHALT: 100 mm						
0.2 / 120.4	GRANULAR: 100 mm	SS	1	85	16		
	GRANULAR FILL: Sand, some gravel, some silt, compact, brown, moist						120
0.9 / 119.7		SS	2A	60	13	1.2	
	SAND: Some silt, trace gravel, compact, greyish brown, moist		2B				
1.5 / 119.1							
	GEORGIAN BAY FORMATION SHALE - - - Highly weathered - - -	SS	3	100	100+		118.8
	- - - Weathered - - -	SS	4	65	100+	2.4	
3.1 / 117.5		SS	5	100	100+		117.6
	Borehole Terminated at 3.1 m						

FIELD TESTING: Shear Strength Testing (kPa) — Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded); 40 80 120 160. Penetration Testing — SPT; DCPT; 10 20 30 40. Field values: 16, 13, 100+, 100+, 100+.

LAB TESTING: Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm); 100 200 300 400. Atterberg Limits — PL; LL. Water Content (%); 10 20 30 40. Values: 8, 13, 5, 3.

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%): GR | SA | SI | CL

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 2.6 m.
Groundwater Elevation: 118.0 m

RECORD OF BOREHOLE No. 8

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829098** Date Started: **May 26/22**
Reviewed By: **AW** Easting: **613855** Date Completed: **May 26/22**

Lithology Plot	DESCRIPTION (Geodetic)	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	0.0 / 121.0				
	0.1 / 120.9 ASPHALT: 75 mm				
	0.2 / 120.8 GRANULAR: 100 mm	SS	1	85	20
	GRANULAR FILL: Sand, some gravel, trace silt, compact, brown, moist				
	0.8 / 120.2 SAND: Some gravel, trace silt, compact, brown, moist	SS	2	85	20
	1.5 / 119.5 GEORGIAN BAY FORMATION SHALE - - - Highly Weathered - - -	SS	3	65	25
	- - - Weathered - - -	SS	4	65	100+
	3.2 / 117.8	SS	5	100	100+
	Borehole Terminated at 3.2 m				

DEPTH (m): 0, 1.2, 2.4
ELEVATION (m): 120, 118.8

FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40
SPT values: 20, 20, 25, 100+, 100+

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
◇ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL ○ LL
Water Content (%)
10 20 30 40
Water Content values: 7, 6, 15, 11, 6

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Jun 1/22 at depth of: 0.0
Cave depth after auger removal: Open
Groundwater Elevation:

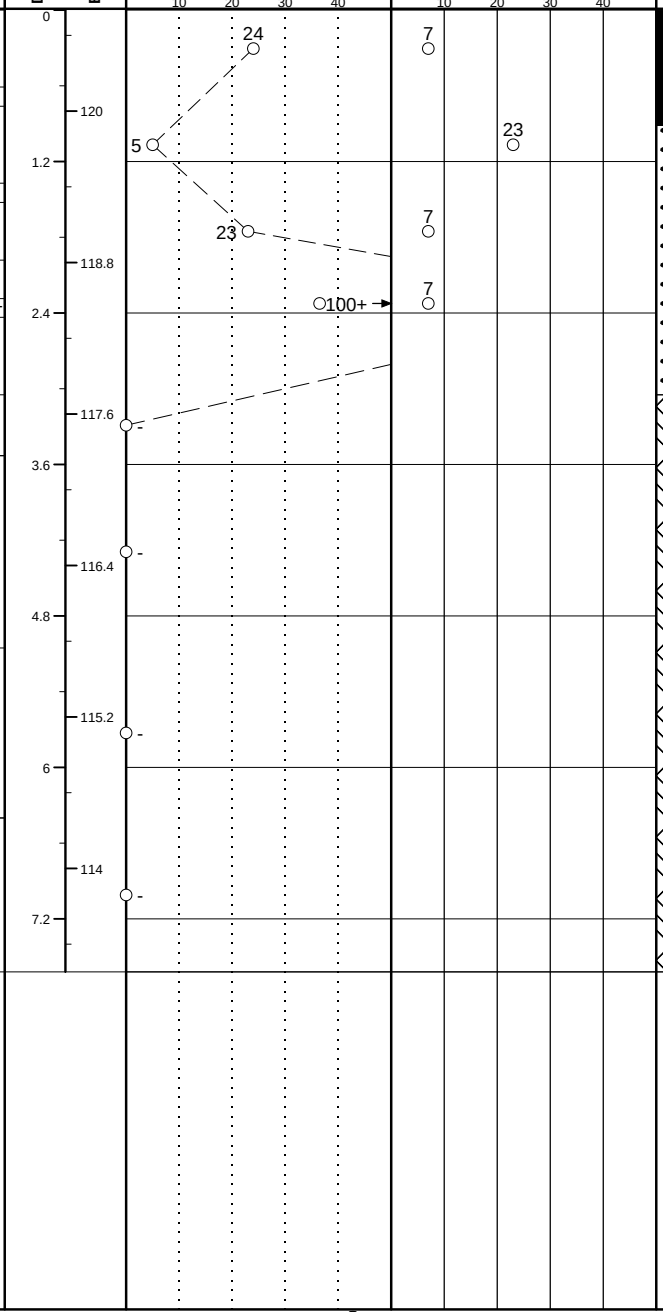
Scale: **1 :60**

RECORD OF BOREHOLE No. 9

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers & Coring** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829082** Date Started: **May 24/22**
Reviewed By: **AW** Easting: **613888** Date Completed: **May 24/22**

Geodetic	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
0.0 / 120.8	ASPHALT: 75 mm				
0.1 / 120.7	GRANULAR: 75 mm				
0.2 / 120.6	GRANULAR FILL: Trace clay, compact, brown, moist - - - Loose - - -	SS	1	70	24
		SS	2	15	5
1.5 / 119.3	SAND: Some gravel, trace silt, loose, brown, moist	SS	3	25	23
2.3 / 118.5	GEORGIAN BAY FORMATION SHALE 2 % Hard Limestone Layers (Weathered)	SS	4	50	100+
		Run	1	-	-
4.4 / 116.4	SOUND BEDROCK	Run	2	-	-
		Run	3	-	-
		Run	4	-	-
7.6 / 113.2	Borehole Terminated at 7.6 m Coring ends				



Instrumentation Installation

GR	SA	SI	CL
14	72	11	3

Run 1 (3.0 to 3.5 m):
TCR: 42 %
SCR: 37 %
RQD: 21 %

Run 2 (3.5 to 5.0 m):
TCR: 100 %
SCR: 85 %
RQD: 40 %

Run 3 (5.0 to 6.3 m):
TCR: 100 %
SCR: 95 %
RQD: 73 %

Run 4 (6.3 to 7.7 m):
TCR: 100 %
SCR: 95 %
RQD: 77 %

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Jun 1/22 at depth of: 0.0
Cave depth after auger removal: Open
Groundwater Elevation:

RECORD OF BOREHOLE No. 10

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829073** Date Started: **May 24/22**
Reviewed By: **AW** Easting: **613915** Date Completed: **May 24/22**

Geodetic	Description	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	Depth (m)	Elevation (m)	GR	SA	SI	CL
0.0 / 120.6	ASPHALT: 50 mm					0	120				
0.2 / 120.4	GRANULAR: 150 mm										
	GRANULAR FILL: Gravelly sand, some silt, compact, brown, moist	SS	1	100	18						
0.8 / 119.8	FILL: Silty sand, some gravel, trace clay, very loose to loose, dark brown, moist	SS	2	100	4	1.2	118.8	15	58	21	6
1.5 / 119.1	GRAVELLY SAND: trace to some silt, brick inclusions, compact, brown, moist	SS	3	100	29						
2.6 / 118.0	SANDY SILT GLACIAL TILL: Some clay, trace gravel, stiff, brown, moist	SS	4A, 4B	100	15	2.4	117.6				
3.0 / 117.6	GEORGIAN BAY FORMATION SHALE - - - Highly weathered - - -	SS	5	100	100+	3.6	116.4				
4.6 / 116.0	INFERRED SOUND BEDROCK	SS	6	100	100+	4.8	115.2				
		SS	7	100	100+	6	114				
		SS	8	100	100+	7.2	112.8				
9.2 / 111.4	Borehole Terminated at 9.2 m	SS	9	100	100+	8.4	111.6				

FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
◇ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL LL
○ Water Content (%)
10 20 30 40

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

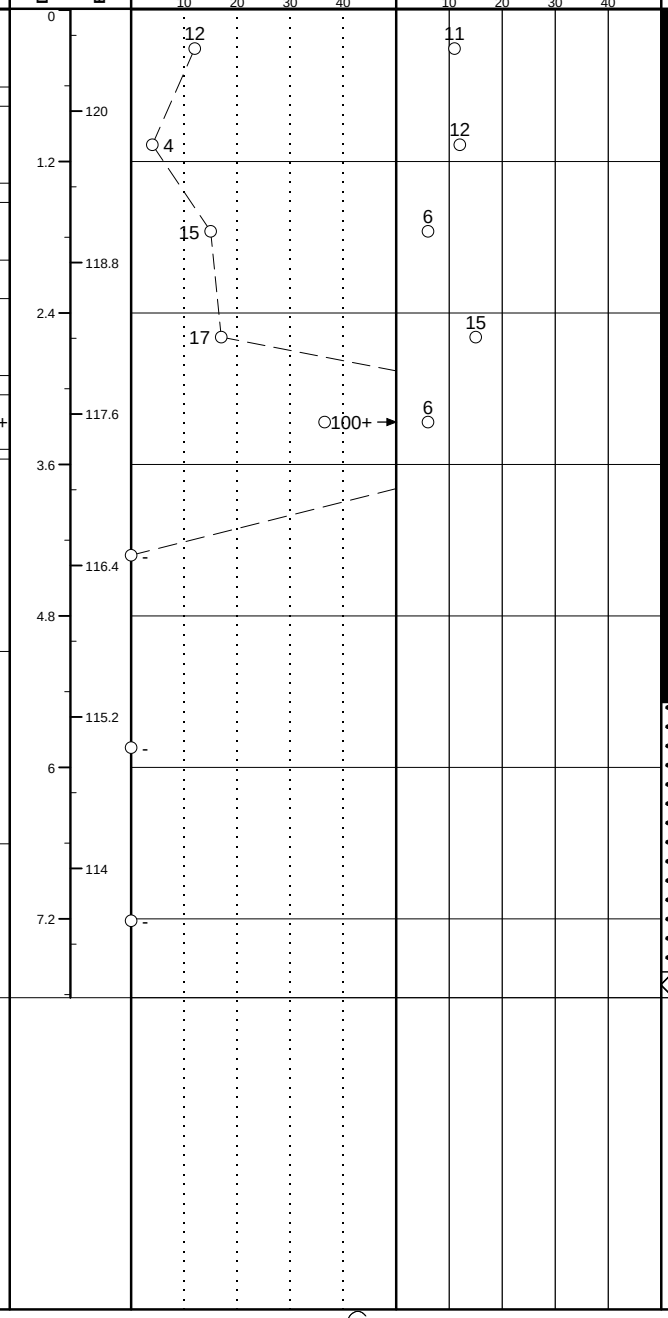
Groundwater depth encountered on completion of drilling: Dry
Groundwater depth observed on: Jun 1/22 at depth of: 3.0 m.
Cave depth after auger removal: Open
Groundwater Elevation: 117.6 m

RECORD OF BOREHOLE No. 11

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers & Coring** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829179** Date Started: **May 26/22**
Reviewed By: **AW** Easting: **613956** Date Completed: **May 26/22**

Geodetic	Description	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
0.0 / 120.8					
0.1 / 120.7					
0.2 / 120.6	ASPHALT: 75 mm				
	GRANULAR: 50 mm	SS	1	60	12
	GRANULAR FILL: Sand and silt, some gravel, compact, dark brown, moist				
	- - - Very loose - - -	SS	2	75	4
1.5 / 119.3					
	GRAVELLY SAND: Some silt, trace clay, compact, brown, moist	SS	3	75	15
2.4 / 118.4					
	SANDY SILT GLACIAL TILL: Some clay, trace gravel, very stiff, brownish grey, moist	SS	4A / 4B	80	17
3.0 / 117.8					
	GEORGIAN BAY FORMATION SHALE 4 % Hard Limestone Layers (Weathered)	SS	5	100	100+
4.0 / 116.8	SOUND BEDROCK	Run	1	-	-
		Run	2	-	-
		Run	3	-	-
7.8 / 113.0					
	Borehole Terminated at 7.8 m Coring ends				



GR	SA	SI	CL
24	63	10	3

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

Run 1 (3.6 to 5.1 m):
TRC: 100 %
SCR: 92 %
RQD: 58 %

Run 2 (5.1 to 6.6 m):
TRC: 100 %
SCR: 100 %
RQD: 83 %

Run 3 (6.6 to 7.8 m):
TRC: 100 %
SCR: 96 %
RQD: 93 %

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

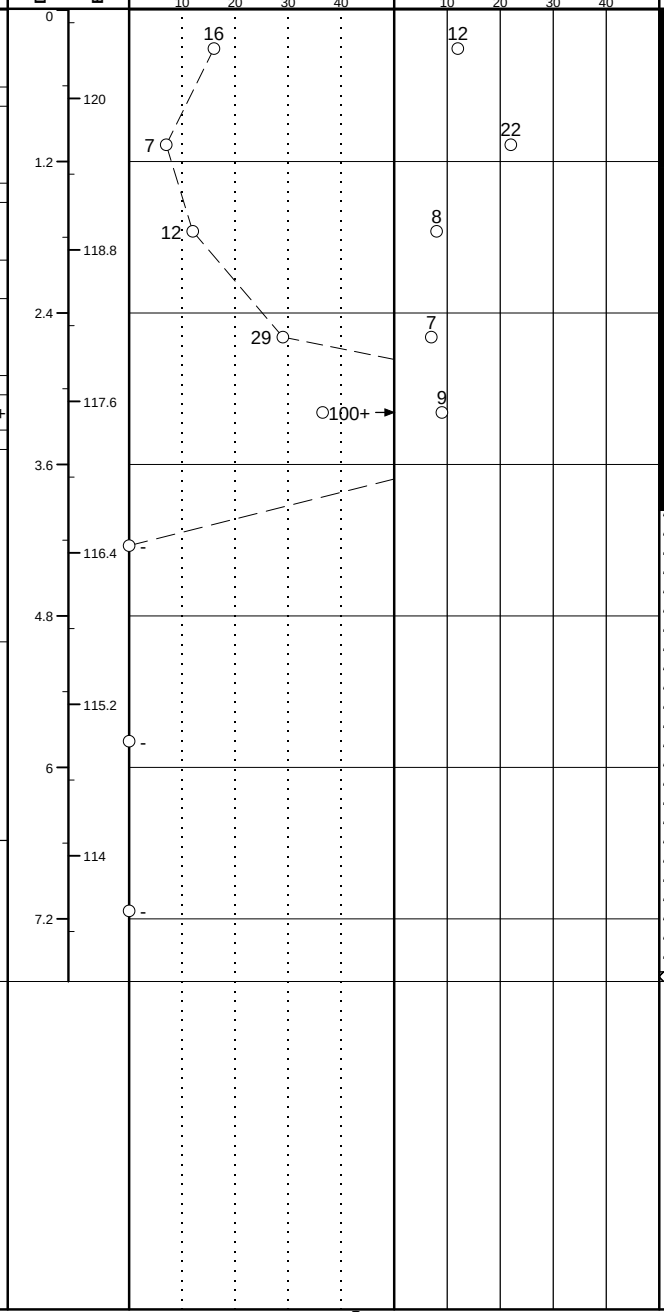
Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 3.2 m.
Groundwater Elevation: 117.6 m

RECORD OF BOREHOLE No. 12

Project Number: **2202029**
Project Client: **Dundix Realty Holdings**
Project Name: **1225 Dundas Street East, Mississauga, ON**
Project Location: **Mississauga, ON**
Drilling Location: **See Borehole Location Plan**
Local Benchmark: **N/A (Geodetic)**

Drilling Method: **Hollow Stem Augers & Coring** Drilling Machine: **Track Mount**
Logged By: **SY** Northing: **4829154** Date Started: **May 26/22**
Reviewed By: **AW** Easting: **613976** Date Completed: **May 26/22**

Geodetic	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
0.0 / 120.7					
0.2 / 120.5	ASPHALT: 25 mm GRANULAR: 150 mm	SS	1	45	16
0.8 / 119.9	GRANULAR FILL: Gravel and sand, some silt, compact, brown, moist				
1.5 / 119.2	FILL: Sandy silt, some clay, trace gravel, trace deleterious material, loose, grey and black, moist	SS	2	50	7
2.3 / 118.4	SAND: Trace to some silt, compact, brown, moist	SS	3	45	12
3.0 / 117.7	SANDY SILT GLACIAL TILL: Trace gravel, trace clay, very stiff, brownish grey, moist	SS	4	100	29
	GEORGIAN BAY FORMATION SHALE 2 % Hard Limestone Layers (Weathered)	SS	5	100	100+
4.5 / 116.2	SOUND BEDROCK	Run	1	-	-
		Run	2	-	-
7.7 / 113.0		Run	3	-	-
	Borehole Terminated at 7.7 m Coring ends				



Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR | SA | SI | CL

Run 1 (3.5 to 5.0 m):
TRC: 100 %
SCR: 93 %
RQD: 33 %

Run 2 (5.0 to 6.6 m):
TRC: 100 %
SCR: 100 %
RQD: 77 %

Run 3 (6.6 to 7.7 m):
TRC: 94 %
SCR: 94 %
RQD: 90 %

GEI CONSULTANTS
647 Welham Road, Unit 14
Barrie, Ontario L4N 0B7
T : (705) 719-7994
www.geiconsultants.com

Groundwater depth encountered on completion of drilling: Dry
Cave depth after auger removal: Open
Groundwater depth observed on: Jun 1/22 at depth of: 3.3 m.
Groundwater Elevation: 117.4 m

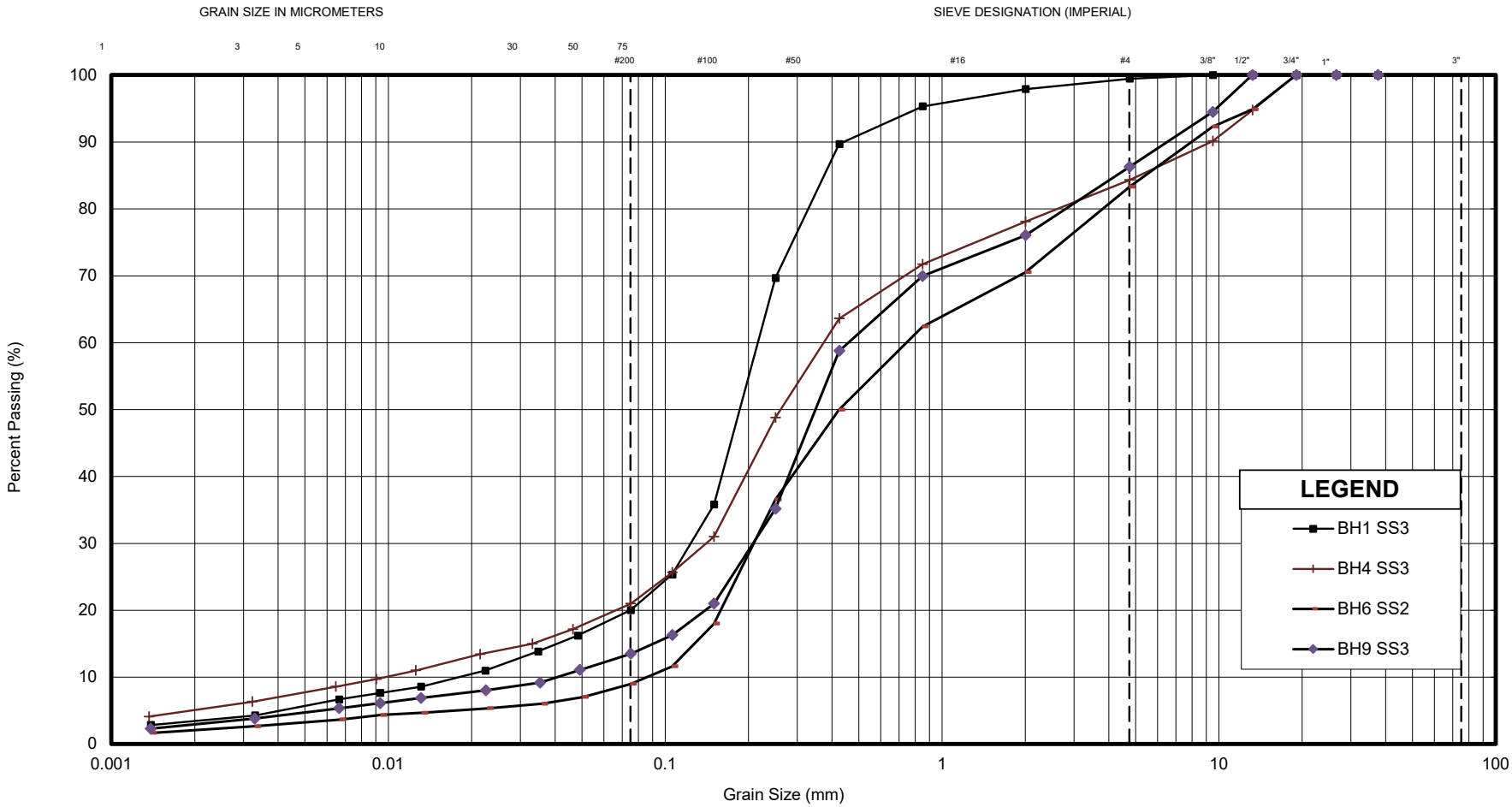
Scale: **1 :60**

Appendix C

Geotechnical Laboratory Testing

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH1 SS3	SAND, Some Silt, Trace Clay, Trace Gravel	1	79	17	3	0.018	0.12	0.22	12	3.9
BH4 SS3	SAND, Some Silt, Some Gravel, Trace Clay	16	63	16	5	0.010	0.14	0.37	38	5.4
BH6 SS2	SAND, Some Gravel, Trace Silt, Trace Clay	17	74	7	2	0.086	0.21	0.74	8.7	0.68
BH9 SS3	SAND, Some Gravel, Some Silt, Trace Clay	14	72	11	3	0.041	0.21	0.46	11	2.3

GEI Consultants

GRAIN SIZE DISTRIBUTION - 1225 Dundas Street East - Dundix Realty Holdings

SAND

FIGURE No. B1

REF. No. 2202029

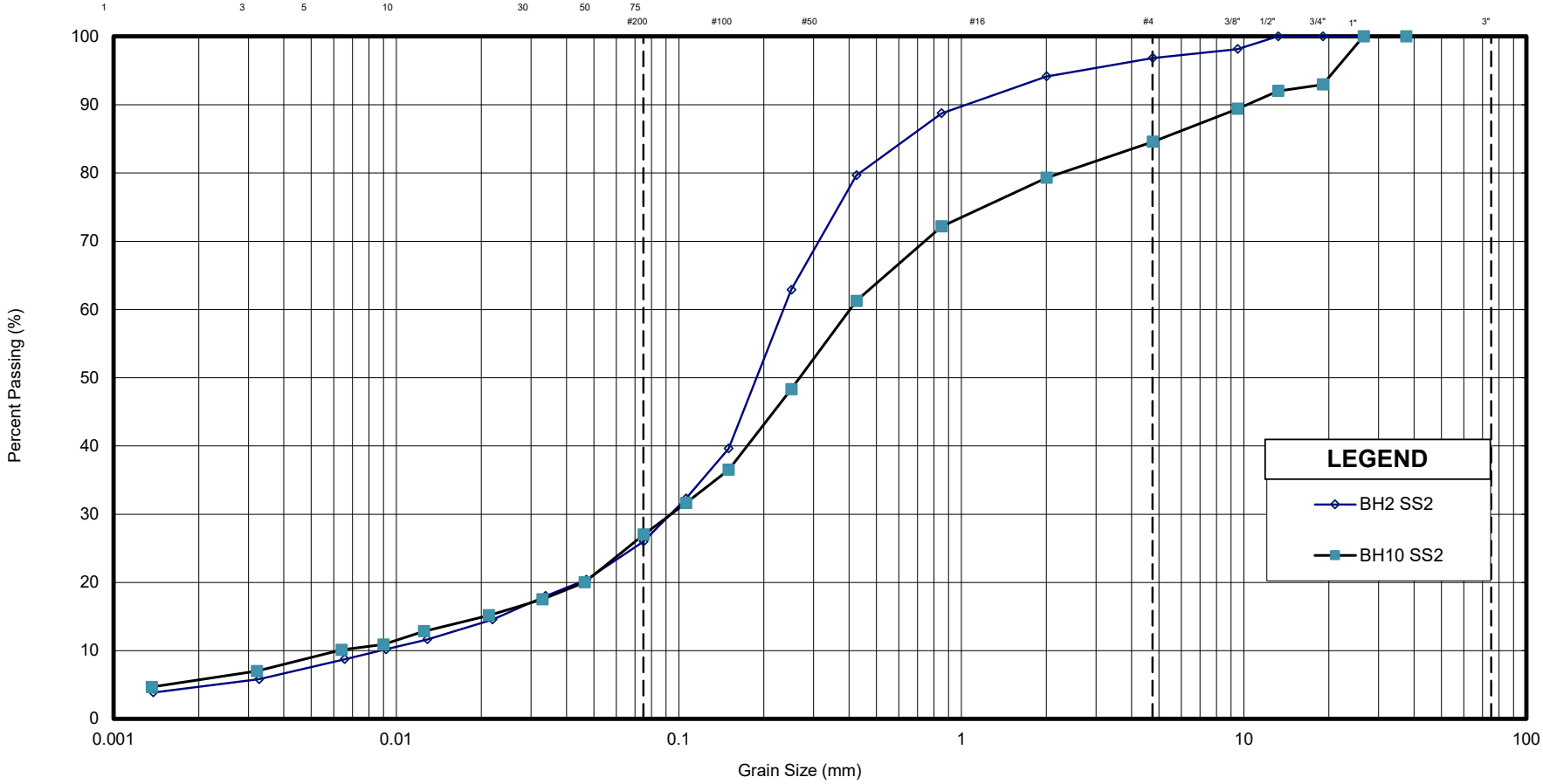
DATE July 2022

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS

SIEVE DESIGNATION (IMPERIAL)



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH2 SS2	SILTY SAND, Trace Clay, Trace Gravel	3	71	21	5	0.009	0.09	0.23	27	4.2
BH10 SS2	SILTY SAND, Some Gravel, Trace Clay	15	58	21	6	0.006	0.09	0.40	65	3.5

GEI Consultants

GRAIN SIZE DISTRIBUTION - 1225 Dundas Street East - Dundix Realty Holdings

SILTY SAND

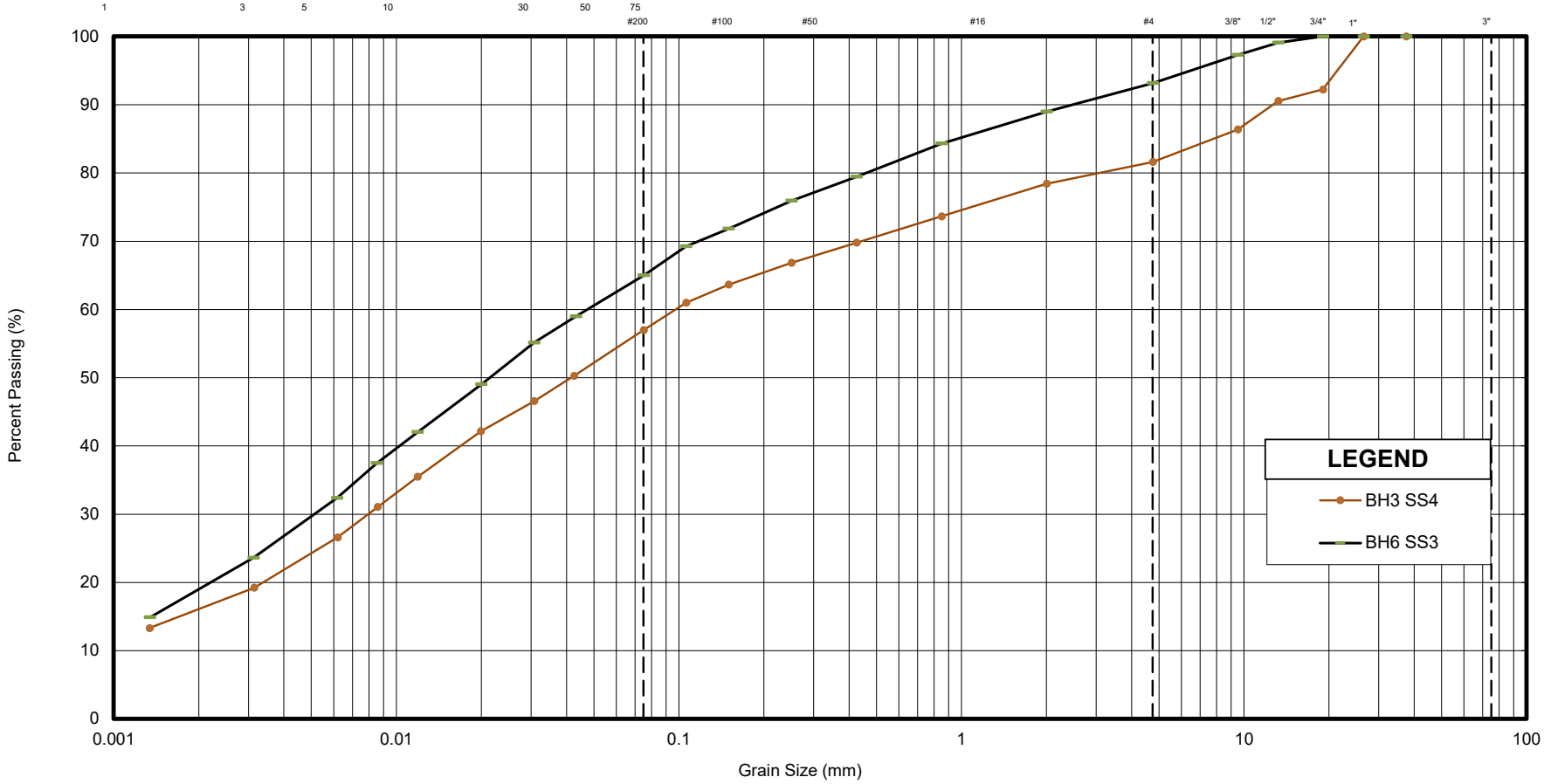
FIGURE No.	B2
REF. No.	2202029
DATE	July 2022

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS

SIEVE DESIGNATION (IMPERIAL)



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH3 SS4	SANDY SILT, Some Gravel, Some Clay	18	25	41	16	-	0.008	0.097	-	-
BH6 SS3	SANDY SILT, Some Clay, Trace Gravel	7	28	46	19	-	0.005	0.047	-	-

GEI Consultants

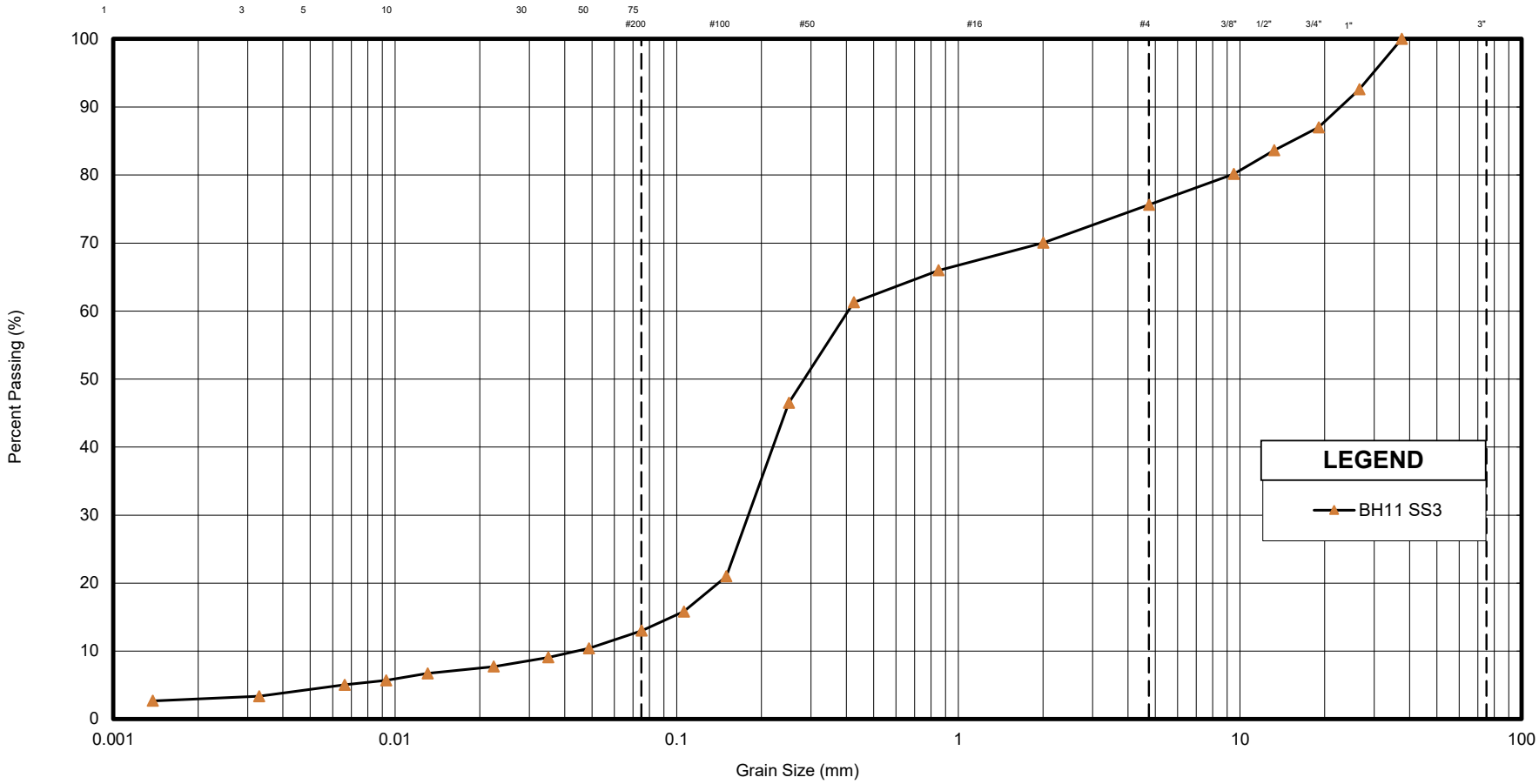
GRAIN SIZE DISTRIBUTION - 1225 Dundas Street East - Dundix Realty Holdings

SANDY SILT GLACIAL TILL

FIGURE No.	B3
REF. No.	2202029
DATE	July 2022

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH11 SS3	GRAVELLY SAND, Some Silt, Trace Clay	24	63	10	3	0.044	0.18	0.41	9.2	1.8

GEI Consultants

GRAIN SIZE DISTRIBUTION - 1225 Dundas Street East - Dundix Realty Holdings

GRAVELLY SAND

FIGURE No.	B4
REF. No.	2202029
DATE	July 2022

GRAIN SIZE DISTRIBUTION REPORT
GRANULAR 'B' TYPE I

GEI Consultants

Project Name:	1225 Dundas Street East	**Date Sampled:**	-
Project No.:	2202029	**Date Tested:**	June 13, 2022
Sample Loc.:	BH 1, 2, 3, 4, 5 and 12 (Composite)	**Lab #:**	4132
Client:	Dundix Realty Holdings	**Technician:**	F. Contento
Supplier:	-		

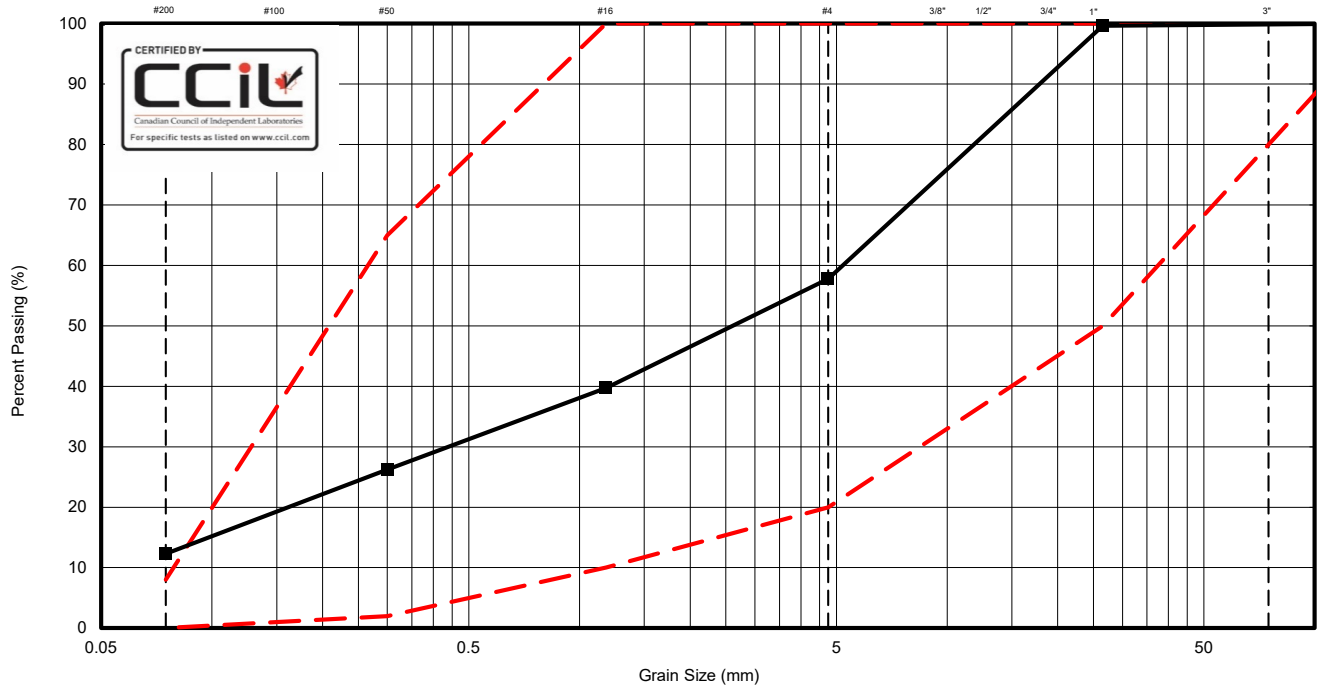
SAMPLE DATA

Total Mass of Sample (g):	7021.8	% Passing 75um by washing:	12.02
Total Mass retained on the 4.75mm sieve (g):	2966.1	Total Losses (%): (Maximum 0.3%)	0.00
Total Mass passing the 4.75 mm sieve (g):	4055.7	Percent Crushed: (Min. 60% - Gran A)	N/A
Percent Coarse Aggregate:	42.24	Not Applicable - Gran. "B" Type 1	
Percent Fine Aggregate:	57.76	Asphalt Coated Particles (%) (Max. 30%)	0%

TOTAL SAMPLE PERCENTAGES					COARSE AND FINE PORTION PERCENTAGES		
Sieve Size (mm)	Percent Passing	Min Spec. (%)	Max Spec. (%)	Pass?	Sieve Size	Percent Retained *	Percent Retained **
150	100.0	100	100	Y	150	0.0	-
26.5	99.7	50	100	Y	26.5	0.8	-
19.0	-	-	-	-	19.00	-	-
13.2	-	-	-	-	13.2	-	-
9.5	-	-	-	-	9.5	-	-
4.75	57.8	20	100	Y	4.75	100.0	-
1.18	39.7	10	100	Y	1.18	-	31.2
0.30	26.2	2	65	Y	0.30	-	54.6
0.15	-	-	-	-	0.15	-	-
0.075	12.3	0	8	N	0.075	-	78.7

* Based on Coarse Portion only ** Based on Fine Portion only

Material Does Not Meet OPSS.MUNI 1010 Specifications for Granular 'B' Type I



647 Welham Road, Unit 14
Barrie, Ontario

GRAIN SIZE DISTRIBUTION REPORT
GRANULAR 'A'

GEI Consultants

Project Name:	1225 Dundas Street East	**Date Sampled:**	-
Project No.:	2202029	**Date Tested:**	June 13, 2022
Sample Loc.:	BH 1, 2, 3, 4, 5 and 12 (Composite)	**Lab #:**	4132
Client:	Dundix Realty Holdings	**Technician:**	F. Contento
Supplier:	-		

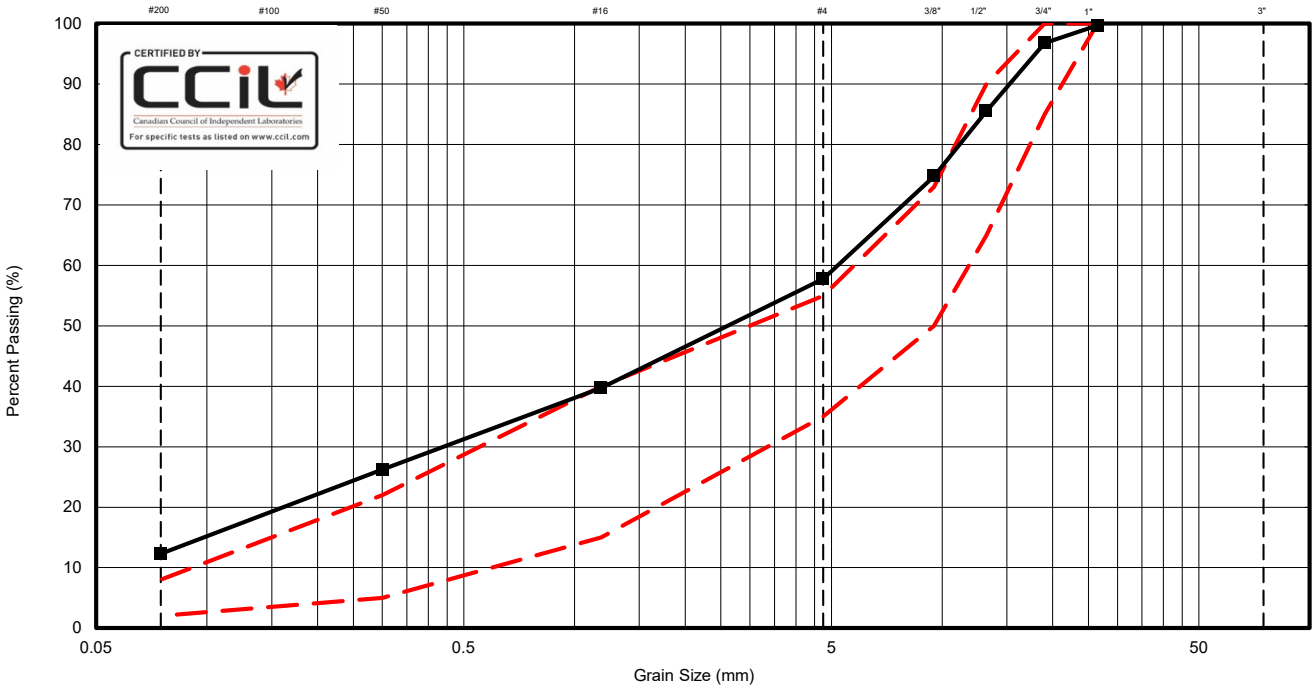
SAMPLE DATA

Total Mass of Sample (g):	7021.8	% Passing 75um by washing:	12.02
Total Mass retained on the 4.75mm sieve (g):	2966.1	Total Losses (%): (Maximum 0.3%)	0.00
Total Mass passing the 4.75 mm sieve (g):	4055.7	Percent Crushed: (Min. 60% - Gran A)	-
Percent Coarse Aggregate:	42.24	Not Applicable - Gran. "B" Type 1	
Percent Fine Aggregate:	57.76	Asphalt Coated Particles (%) (Max. 30%)	0%

TOTAL SAMPLE PERCENTAGES					COARSE AND FINE PORTION PERCENTAGES		
Sieve Size (mm)	Percent Passing	Min Spec. (%)	Max Spec. (%)	Pass?	Sieve Size	Percent Retained *	Percent Retained **
150	-	-	-	-	150	-	-
26.5	99.7	100	100	N	26.5	0.8	-
19.0	96.8	85	100	Y	19.00	7.6	-
13.2	85.5	65	90	Y	13.2	34.3	-
9.5	74.7	50	73	N	9.5	59.8	-
4.75	57.8	35	55	N	4.75	100.0	-
1.18	39.7	15	40	Y	1.18	-	31.2
0.30	26.2	5	22	N	0.30	-	54.6
0.15	-	-	-	-	0.15	-	-
0.075	12.3	2	8	N	0.075	-	78.7

* Based on Coarse Portion only ** Based on Fine Portion only

Material Does Not Meet OPSS.MUNI 1010 Specifications for Granular 'A'



647 Welham Road, Unit 14
Barrie, Ontario

GRAIN SIZE DISTRIBUTION REPORT
GRANULAR 'B' TYPE I

GEI Consultants

Project Name:	1225 Dundas Street East	**Date Sampled:**	-
Project No.:	2202029	**Date Tested:**	June 13, 2022
Sample Loc.:	BH 6, 7, 8 and 11 (Composite)	**Lab #:**	4133
Client:	Dundix Realty Holdings	**Technician:**	F. Contento
Supplier:	-		

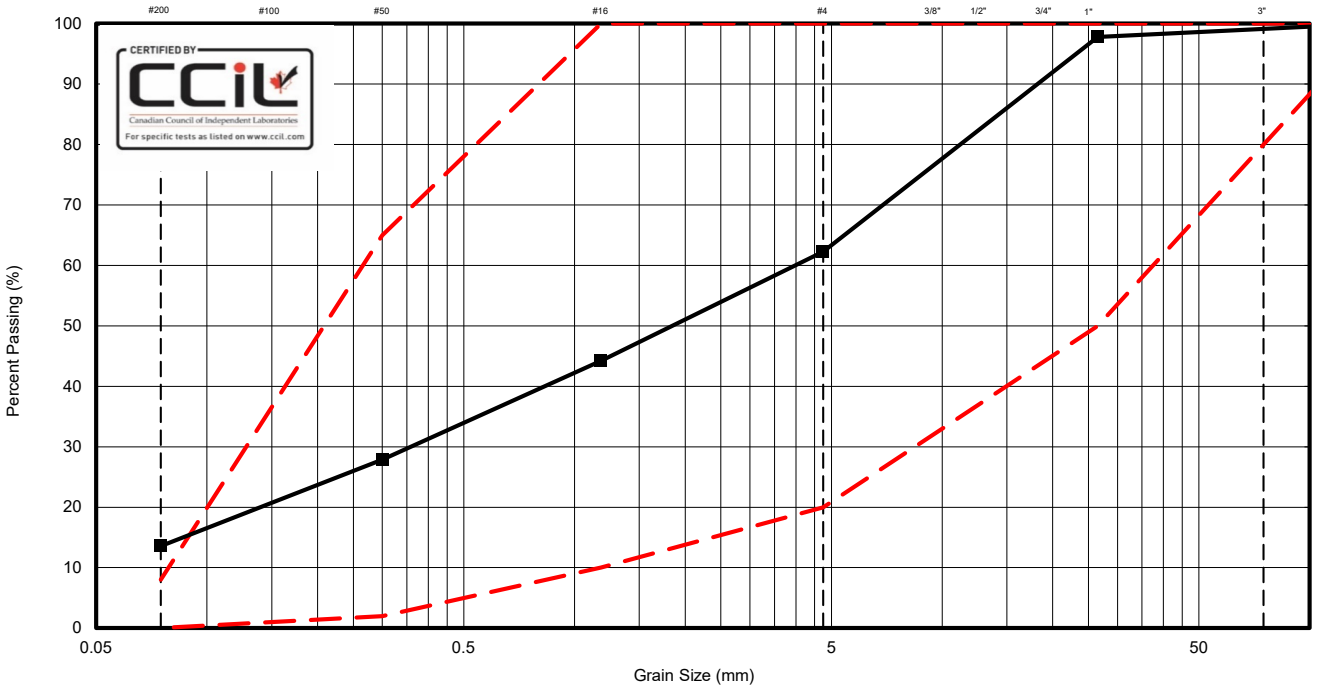
SAMPLE DATA

Total Mass of Sample (g):	2050.9	% Passing 75um by washing:	13.30
Total Mass retained on the 4.75mm sieve (g):	773.1	Total Losses (%): (Maximum 0.3%)	0.00
Total Mass passing the 4.75 mm sieve (g):	1277.8	Percent Crushed: (Min. 60% - Gran A)	N/A
Percent Coarse Aggregate:	37.70	Not Applicable - Gran. "B" Type 1	
Percent Fine Aggregate:	62.30	Asphalt Coated Particles (%) (Max. 30%)	0%

TOTAL SAMPLE PERCENTAGES					COARSE AND FINE PORTION PERCENTAGES		
Sieve Size (mm)	Percent Passing	Min Spec. (%)	Max Spec. (%)	Pass?	Sieve Size	Percent Retained *	Percent Retained **
150	100.0	100	100	Y	150	0.0	-
26.5	97.8	50	100	Y	26.5	5.9	-
19.0	-	-	-	-	19.00	-	-
13.2	-	-	-	-	13.2	-	-
9.5	-	-	-	-	9.5	-	-
4.75	62.3	20	100	Y	4.75	100.0	-
1.18	44.2	10	100	Y	1.18	-	29.0
0.30	27.9	2	65	Y	0.30	-	55.2
0.15	-	-	-	-	0.15	-	-
0.075	13.5	0	8	N	0.075	-	78.3

* Based on Coarse Portion only ** Based on Fine Portion only

Material Does Not Meet OPSS.MUNI 1010 Specifications for Granular 'B' Type I



647 Welham Road, Unit 14
Barrie, Ontario

GRAIN SIZE DISTRIBUTION REPORT
GRANULAR 'A'

GEI Consultants

Project Name:	1225 Dundas Street East	**Date Sampled:**	-
Project No.:	2202029	**Date Tested:**	June 13, 2022
Sample Loc.:	BH 6, 7, 8 and 11 (Composite)	**Lab #:**	4133
Client:	Dundix Realty Holdings	**Technician:**	F. Contento
Supplier:	-		

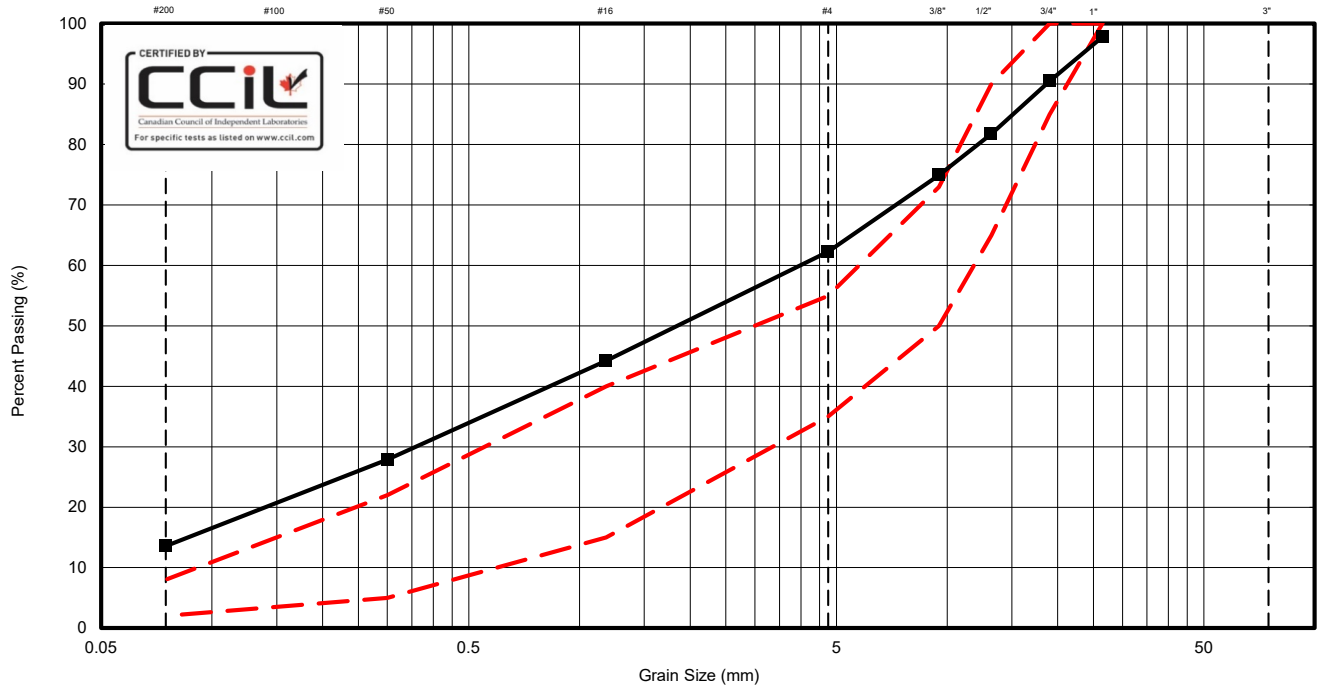
SAMPLE DATA

Total Mass of Sample (g):	2050.9	% Passing 75um by washing:	13.30
Total Mass retained on the 4.75mm sieve (g):	773.1	Total Losses (%): (Maximum 0.3%)	0.00
Total Mass passing the 4.75 mm sieve (g):	1277.8	Percent Crushed: (Min. 60% - Gran A)	-
Percent Coarse Aggregate:	37.70	Not Applicable - Gran. "B" Type 1	
Percent Fine Aggregate:	62.30	Asphalt Coated Particles (%) (Max. 30%)	0%

TOTAL SAMPLE PERCENTAGES					COARSE AND FINE PORTION PERCENTAGES		
Sieve Size (mm)	Percent Passing	Min Spec. (%)	Max Spec. (%)	Pass?	Sieve Size	Percent Retained *	Percent Retained **
150	-	-	-	-	150	-	-
26.5	97.8	100	100	N	26.5	5.9	-
19.0	90.5	85	100	Y	19.00	25.2	-
13.2	81.8	65	90	Y	13.2	48.4	-
9.5	74.9	50	73	N	9.5	66.5	-
4.75	62.3	35	55	N	4.75	100.0	-
1.18	44.2	15	40	N	1.18	-	29.0
0.30	27.9	5	22	N	0.30	-	55.2
0.15	-	-	-	-	0.15	-	-
0.075	13.5	2	8	N	0.075	-	78.3

* Based on Coarse Portion only ** Based on Fine Portion only

Material Does Not Meet OPSS.MUNI 1010 Specifications for Granular 'A'



647 Welham Road, Unit 14
Barrie, Ontario

Appendix D

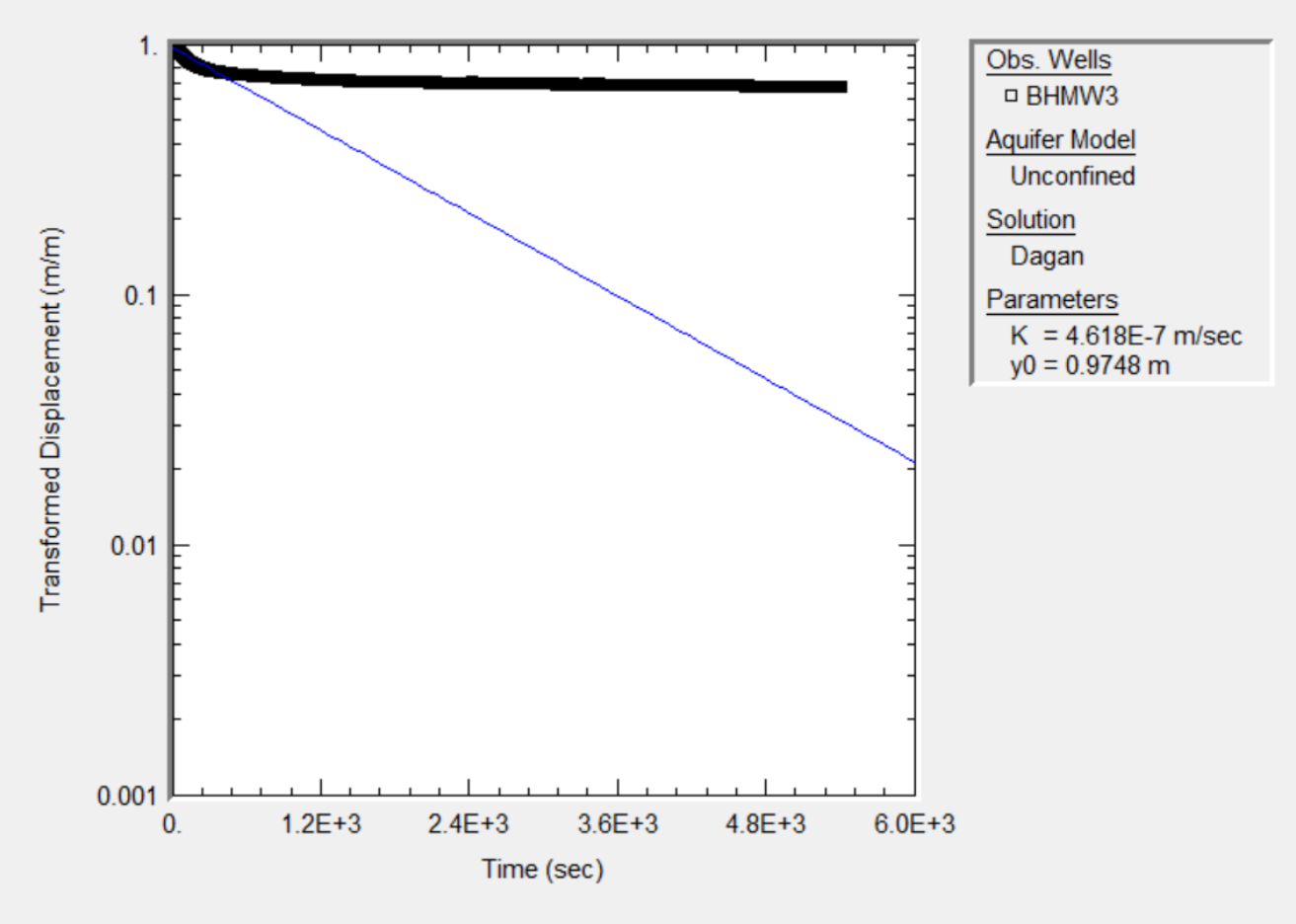
Borehole Permeability Plots

GEI Consultants

Estimation of K by Slug Test, based on Dagan equation

Date:	June 1, 2022
Conducted by:	S. Li

Well Number:	BH/MW3	
Well Screen Bottom:	4.50	mbgs
Top of Pipe:	0.10	mbgs
Well Casing Diameter:	5.08	cm
Well Elevation:	120.40	m
Static Water Level:	3.42	mbgs
$K = r^2\ln(L/R)/(2LTo)$ =	**$4.6x10^{-7}$**	m/s

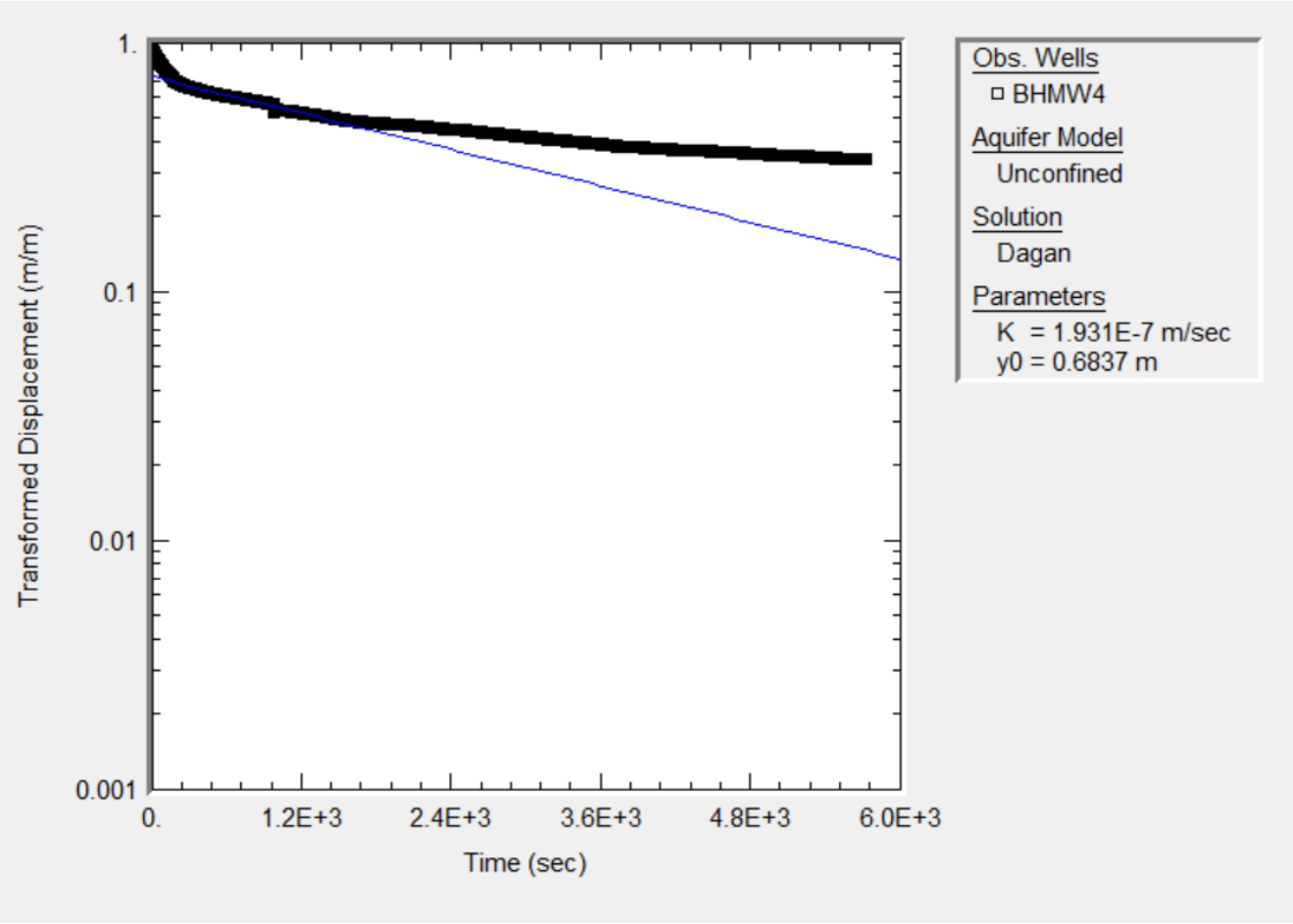


GEI Consultants

Estimation of K by Slug Test, based on Dagan equation

Date:	June 1, 2022
Conducted by:	S. Li

Well Number:	BH/MW4	
Well Screen Bottom:	3.20	mbgs
Top of Pipe:	0.08	mbgs
Well Casing Diameter:	5.08	cm
Well Elevation:	120.30	m
Static Water Level:	2.22	mbgs
$K = r^2\ln(L/R)/(2LTo)$ =	**$1.9x10^{-7}$**	m/s

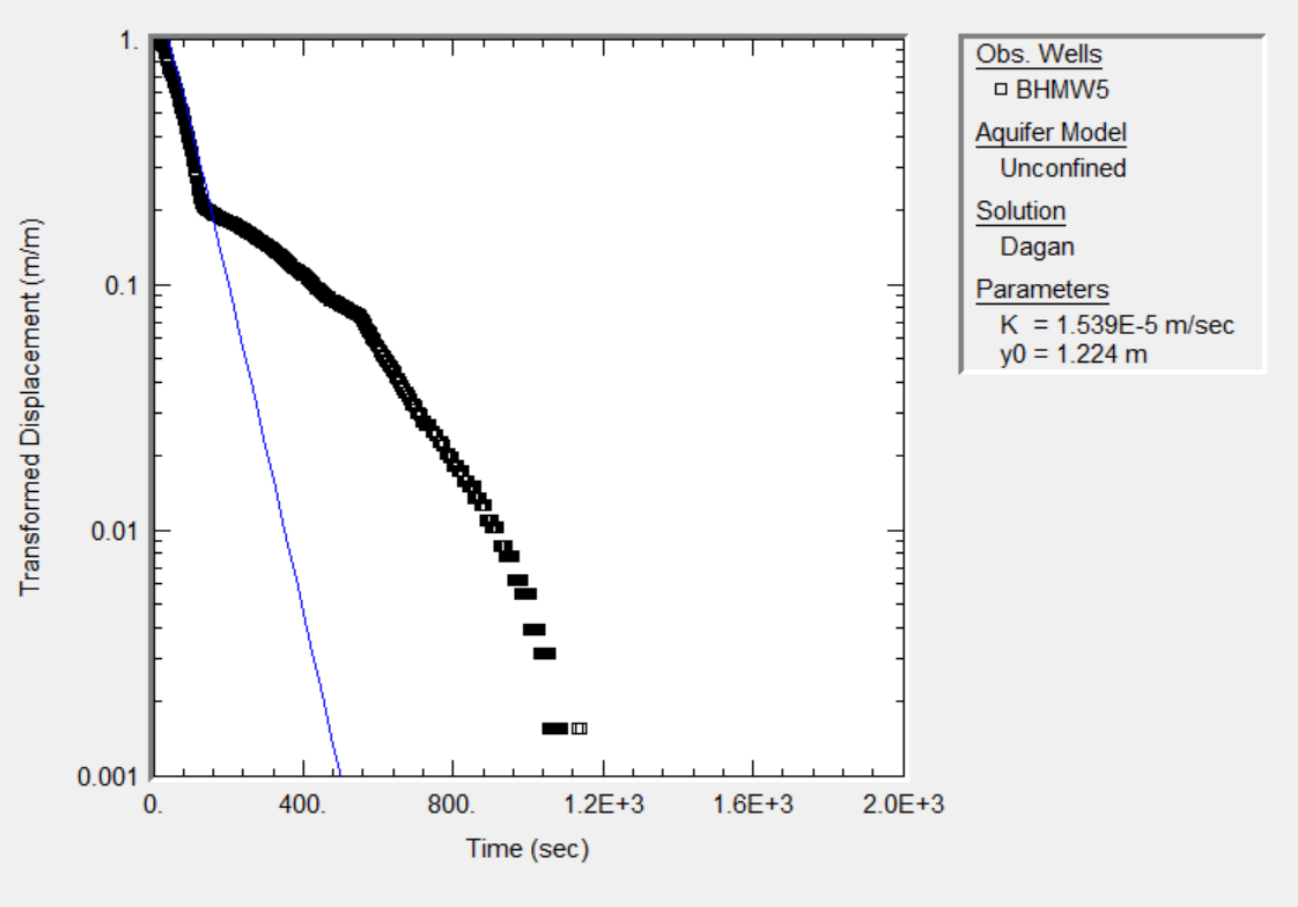


GEI Consultants

Estimation of K by Slug Test, based on Dagan equation

Date:	June 1, 2022
Conducted by:	S. Li

Well Number:	BH/MW5	
Well Screen Bottom:	3.12	mbgs
Top of Pipe:	0.09	mbgs
Well Casing Diameter:	5.08	cm
Well Elevation:	120.20	m
Static Water Level:	2.08	mbgs
$K = r^2\ln(L/R)/(2LTo)$ =	**$1.5x10^{-5}$**	m/s

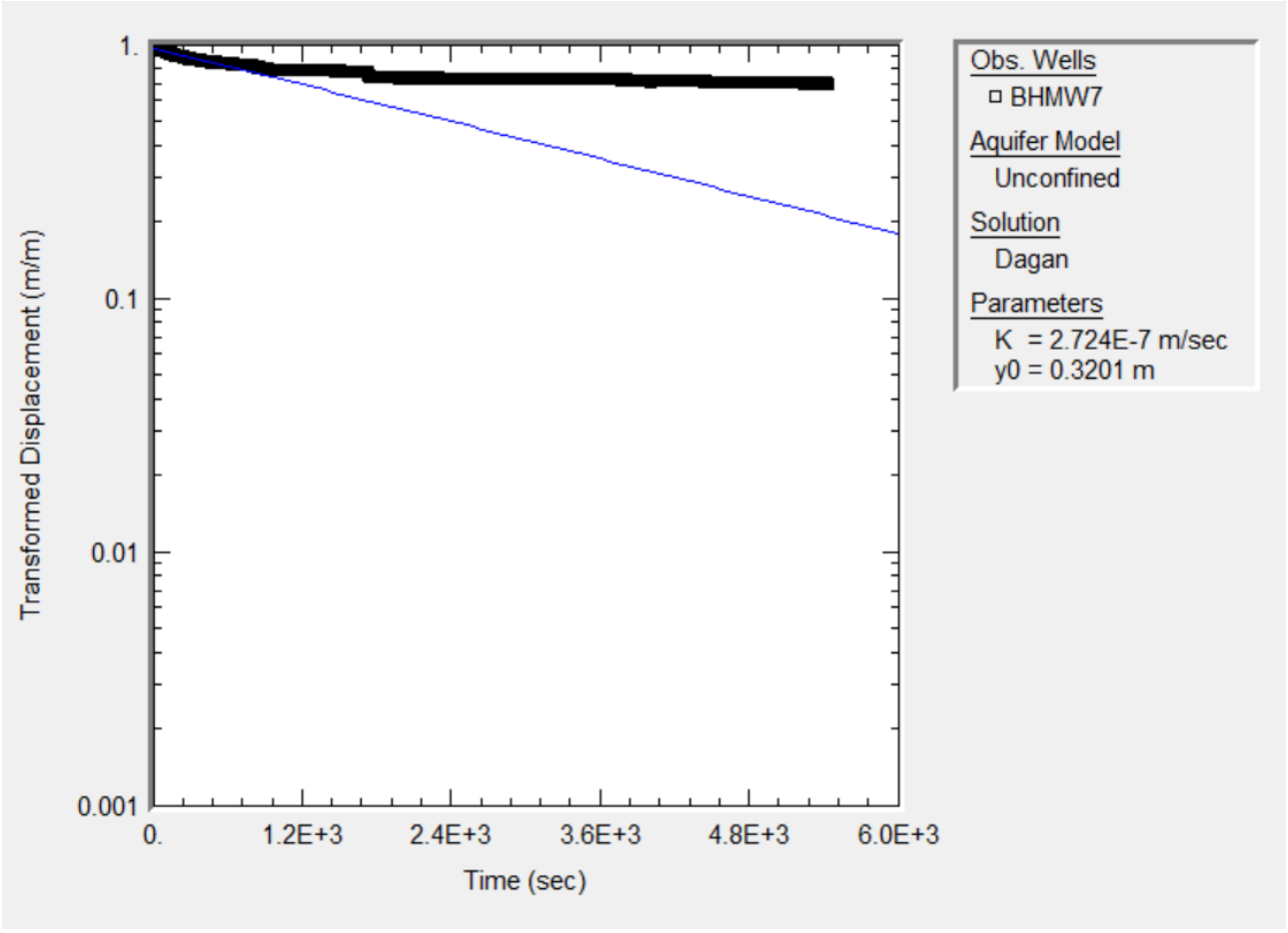


GEI Consultants

Estimation of K by Slug Test, based on Dagan equation

Date:	June 1, 2022
Conducted by:	S. Li

Well Number:	BH/MW7	
Well Screen Bottom:	3.05	mbgs
Top of Pipe:	0.10	mbgs
Well Casing Diameter:	5.08	cm
Well Elevation:	120.60	m
Static Water Level:	2.63	mbgs
$K = r^2\ln(L/R)/(2LTo)$ =	**$2.7x10^{-7}$**	m/s

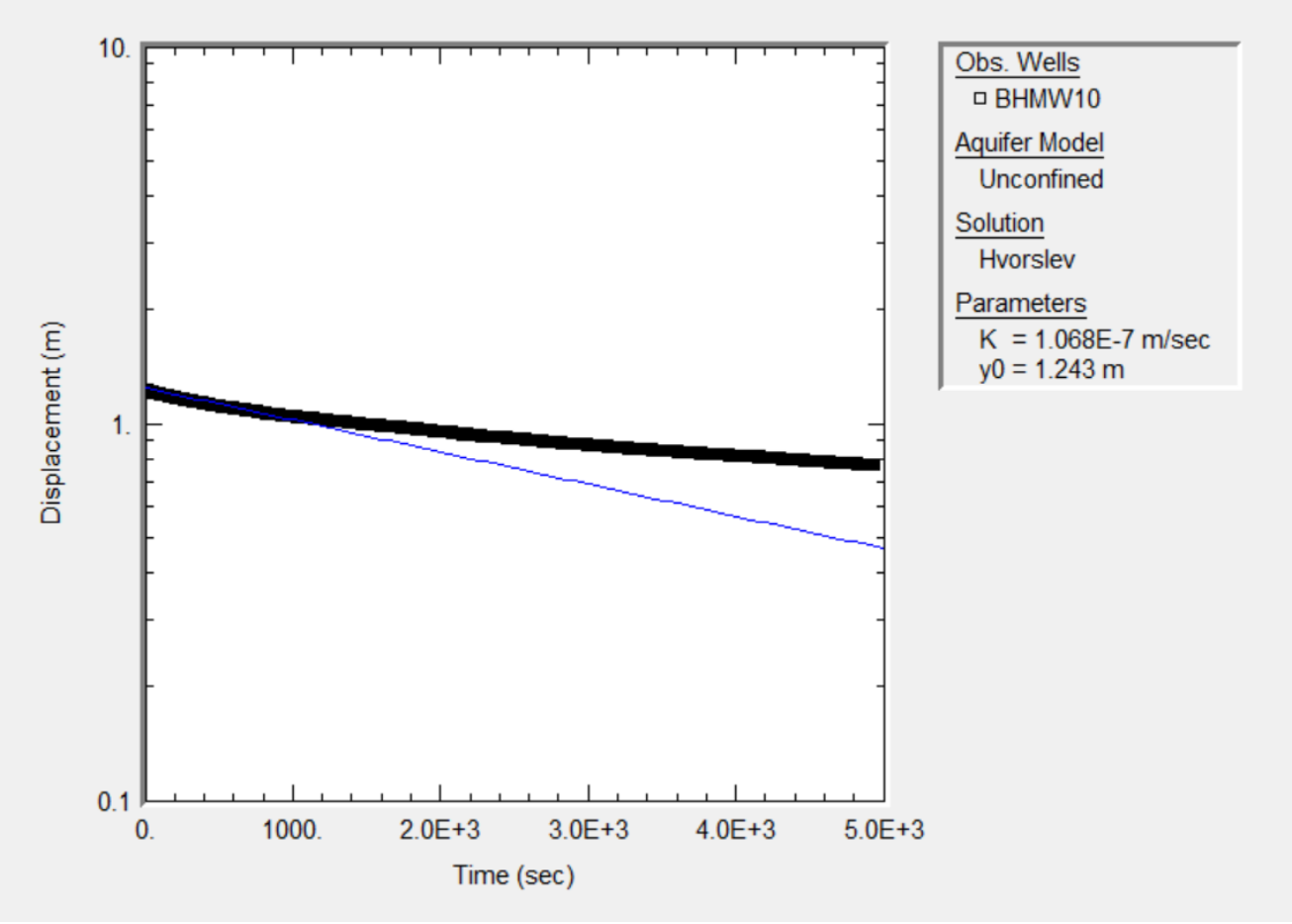


GEI Consultants

Estimation of K by Slug Test, based on Horslev equation

Date:	June 1, 2022
Conducted by:	S. Li

Well Number:	BH/MW10	
Well Screen Bottom:	8.55	mbgs
Top of Pipe:	0.09	mbgs
Well Casing Diameter:	5.08	cm
Well Elevation:	120.60	m
Static Water Level:	2.80	mbgs
$K = r^2\ln(L/R)/(2LTo)$ =	**1.1×10^{-7}**	m/s

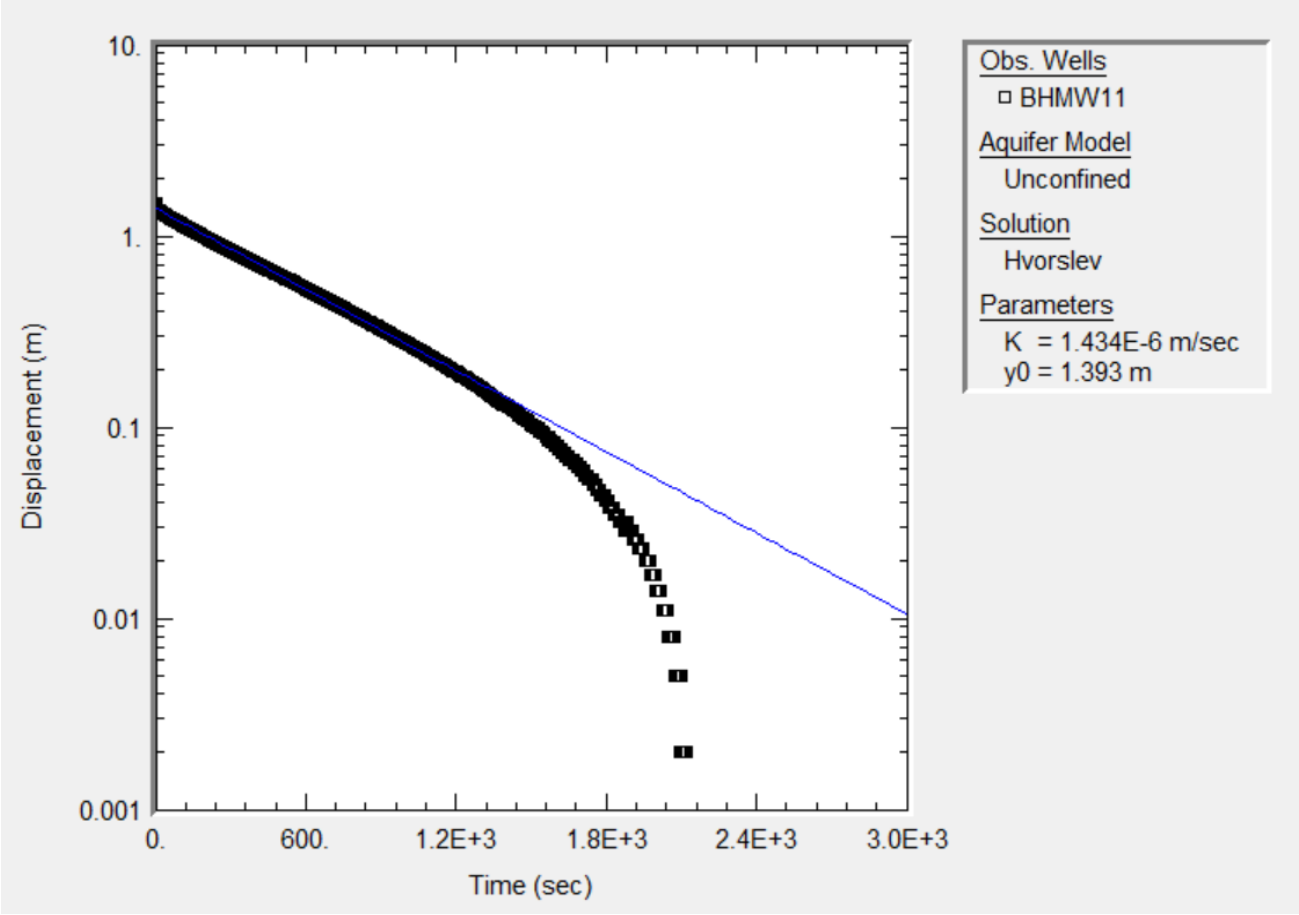


GEI Consultants

Estimation of K by Slug Test, based on Horslev equation

Date:	June 1, 2022
Conducted by:	S. Li

Well Number:	BH/MW11	
Well Screen Bottom:	7.68	mbgs
Top of Pipe:	0.12	mbgs
Well Casing Diameter:	5.08	cm
Well Elevation:	120.80	m
Static Water Level:	3.21	mbgs
$K = r^2\ln(L/R)/(2LTo)$ =	**$1.4x10^{-6}$**	m/s



Appendix E

Water Quality Laboratory Certificate Of Analysis And Chain Of Custody

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	1	Kingston	kwe	13-Jun-22	A-CN-001 (k)	SM 4500CN
Anions	1	Holly Lane	VK	09-Jun-22	A-IC-01 (o)	SM4110C
pH	1	Holly Lane	SYL	08-Jun-22	A-PH-01 (o)	SM 4500H
A - Wet Chem	1	Kingston	ach	08-Jun-22	A-TPTKN-001 (N)(k)	E3516.2
A - Wet Chem	1	Kingston	ach	08-Jun-22	A-TPTKN-001 (P)(k)	E3516.2
Total Suspended Solids	2	Kingston	TK	09-Jun-22	A-TSS-001 (k)	SM2540D
Comment	1	Default Site	CS	08-Jun-22	C-Arochlor Comment	-
BOD	1	Kingston	JWF	08-Jun-22	C-BOD-001 (k)	SM 5210B
SVOC	1	Kingston	esi	10-Jun-22	C-NAB-W-001 (k)	EPA 8270
Oil & Grease	1	Kingston	MTY	09-Jun-22	C-O&G-001 (k)	SM 5520
PCB's	1	Kingston	CS	08-Jun-22	C-PCB-03 K	EPA 8082
Phenolics (4-aap)	1	Kingston	kwe	08-Jun-22	C-PHEN-01 (k)	MOEE 3179
VOC's	1	Richmond Hill	FAL	07-Jun-22	C-VOC-02 (rh)	EPA 8260
Chromium (VI)	2	Holly Lane	CWp	16-Jun-22	D-CRVI-01 (o)	MOE E3056
Mercury	2	Holly Lane	PBK	13-Jun-22	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	2	Holly Lane	NHG	13-Jun-22	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	2	Holly Lane	TPR	09-Jun-22	D-ICPMS-01 (o)	EPA 200.8
Subcontracted	1	Default Site	CWp	15-Jun-22	S-Nonylphenols	Subcontract

Peel Sanitary/Storm - Peek Sanitary/Storm Sewer
Peel Sanitary Sewer - Peel Sanitary Sewer
Peel Storm Sewer - Peel Storm Sewer

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Peel Sanitary/Storm	
	Sample I.D.		B22-16928-1	B22-16928-2			Peel Sanitary Sewer	Peel Storm Sewer
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.20				10.0	9.0
BOD(5 day)	mg/L	3	< 3				300	15
Cyanide (Total)	mg/L	0.005	< 0.005				2	0.02
Fluoride	mg/L	0.1	< 10				10	
Total Kjeldahl Nitrogen	mg/L	0.1	**6.2**				100	1
Oil and Grease-Anim/Veg. (Calculation)	mg/L	1.0	< 1.0				150	
Oil and Grease-Mineral	mg/L	1.0	< 1.0				15	
Oil & Grease-Total	mg/L	1.0	< 1.0					
Phenolics	mg/L	0.001	< 0.001				1.0	0.008
Phosphorus-Total	mg/L	0.01	**1.14**				10	0.4
Total Suspended Solids	mg/L	3	**250**	7			350	15
Aluminum (total)	mg/L	0.01	3.27	0.10			50	
Antimony	mg/L	0.0001	0.0004	0.0002			5	
Arsenic	mg/L	0.0001	0.0023	0.0013			1	0.02
Cadmium	mg/L	0.005	< 0.005	< 0.005			0.7	0.008
Chromium	mg/L	0.002	0.004	< 0.002			5	0.08
Chromium (VI)	mg/L	0.01	< 0.01 [1]	< 0.01 [1]				
Cobalt	mg/L	0.005	0.013	0.010			5	
Copper	mg/L	0.002	0.029	0.020			3	0.05
Lead	mg/L	0.02	< 0.02	< 0.02			3	0.120
Manganese (Total)	mg/L	0.001	**2.44**	**2.48**			5	0.05
Mercury	mg/L	0.00002	0.00004	0.00004			0.01	0.0004
Molybdenum	mg/L	0.01	< 0.01	< 0.01			5	

Peel Sanitary/Storm - Peek Sanitary/Storm Sewer
Peel Sanitary Sewer - Peel Sanitary Sewer
Peel Storm Sewer - Peel Storm Sewer

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Peel Sanitary/Storm	
	Sample I.D.		B22-16928-1	B22-16928-2			Peel Sanitary Sewer	Peel Storm Sewer
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
Nickel	mg/L	0.01	< 0.01	< 0.01			3	0.08
Selenium	mg/L	0.001	0.004	0.004			1	0.02
Silver	mg/L	0.0001	< 0.0001	< 0.0001			5	0.12
Sulphate	mg/L	1	219				1500	
Chloroform	mg/L	0.001	< 0.001				0.04	0.002
Dichlorobenzene,1,2-	mg/L	0.0005	< 0.0005				0.05	0.0056
Dichlorobenzene,1,4-	mg/L	0.0005	< 0.0005				0.08	0.0068
Dichloroethene, cis-1,2-	mg/L	0.0005	< 0.0005				4	0.0056
Dichloropropene, trans-1,3-	mg/L	0.0005	< 0.0005				0.14	0.0056
Ethylbenzene	mg/L	0.0005	< 0.0005				0.16	0.002
Silver	mg/L	0.005	< 0.005	< 0.005			5	0.12
Tin	mg/L	0.05	< 0.05	< 0.05			5	
Titanium	mg/L	0.005	0.063	< 0.005			5	
Zinc	mg/L	0.005	0.019	< 0.005			3	0.04
Benzene	mg/L	0.0005	< 0.0005				0.01	0.002
Dichloromethane (Methylene Chloride)	mg/L	0.005	< 0.005				2	0.0052
Tetrachloroethane,1,1,2,2-	mg/L	0.0005	< 0.0005				1.4	0.017
Tetrachloroethylene	mg/L	0.0005	< 0.0005				1	0.0044
Toluene	mg/L	0.0005	< 0.0005				0.27	0.002
Trichloroethylene	mg/L	0.0005	< 0.0005				0.4	0.008
Xylene, m,p,o-	mg/L	0.0011	< 0.0011				1.4	0.0044

Peel Sanitary/Storm - Peek Sanitary/Storm Sewer
Peel Sanitary Sewer - Peel Sanitary Sewer
Peel Storm Sewer - Peel Storm Sewer

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Peel Sanitary/Storm	
	Sample I.D.		B22-16928-1	B22-16928-2			Peel Sanitary Sewer	Peel Storm Sewer
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
Xylene, m,p-	µg/L	1.0	< 1.0					
Xylene, o-	µg/L	0.5	< 0.5					
Poly-Chlorinated Biphenyls (PCB's)	mg/L	0.00005	< 0.00005				0.001	0.0004
Aroclor	-		-					
Methyl Ethyl Ketone	mg/L	0.02	< 0.02				8	
Styrene	mg/L	0.0005	< 0.0005				0.2	
Nonylphenols	mg/L	0.001	< 0.001 [2]				0.02	
Nonylphenol Ethoxylates	mg/L	0.01	< 0.01 [2]				0.2	
Nonylphenol Monoethoxylate	µg/L	10	< 10 [2]					
Nonylphenol Diethoxylate	µg/L	10	< 10 [2]					
Bis(2-ethylhexyl) Phthalate	mg/L	0.005	< 0.005				0.012	0.0088
Di-n-butyl Phthalate	mg/L	0.001	< 0.001				0.08	0.015
Total PAH	mg/L	0.0001	< 0.0001					
Acenaphthene	µg/L	0.05	< 0.05					
Acenaphthylene	µg/L	0.05	< 0.05					
Anthracene	µg/L	0.05	< 0.05					
Benzo(a)anthracene	µg/L	0.05	< 0.05					
Benzo(a)pyrene	µg/L	0.01	< 0.01					
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1					
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05					
Chrysene	µg/L	0.05	< 0.05					

Peel Sanitary/Storm - Peek Sanitary/Storm Sewer
Peel Sanitary Sewer - Peel Sanitary Sewer
Peel Storm Sewer - Peel Storm Sewer

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Peel Sanitary/Storm	
	Sample I.D.		B22-16928-1	B22-16928-2			Peel Sanitary Sewer	Peel Storm Sewer
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05					
Fluoranthene	µg/L	0.05	< 0.05					
Fluorene	µg/L	0.05	< 0.05					
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05					
Methylnaphthalene,1-	µg/L	0.05	< 0.05					
Methylnaphthalene,2-	µg/L	0.05	< 0.05					
Naphthalene	µg/L	0.05	< 0.05					
Phenanthrene	µg/L	0.05	< 0.05					
Pyrene	µg/L	0.05	< 0.05					

1 . Chromium (VI) result is based on total Chromium
2 . Subcontracted to SGS Lakefield

Peel Sanitary/Storm - Peek Sanitary/Storm Sewer
Peel Sanitary Sewer - Peel Sanitary Sewer
Peel Storm Sewer - Peel Storm Sewer

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: --- **REPORT No. B22-16928**

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

Summary of Exceedances

Peel Storm Sewer		
MW5	Found Value	Limit
Total Suspended Solids (mg/L)	250	15
Total Kjeldahl Nitrogen (mg/L)	6.2	1
Phosphorus-Total (mg/L)	1.14	0.4
Manganese (Total) (mg/L)	2.44	0.05
MW5 - filtered	Found Value	Limit
Manganese (Total) (mg/L)	2.48	0.05

Peel Sanitary/Storm - Peek Sanitary/Storm Sewer
Peel Sanitary Sewer - Peel Sanitary Sewer
Peel Storm Sewer - Peel Storm Sewer

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	1	Kingston	kwe	13-Jun-22	A-CN-001 (k)	SM 4500CN
Anions	1	Holly Lane	VK	09-Jun-22	A-IC-01 (o)	SM4110C
pH	1	Holly Lane	SYL	08-Jun-22	A-PH-01 (o)	SM 4500H
A - Wet Chem	1	Kingston	ach	08-Jun-22	A-TPTKN-001 (N)(k)	E3516.2
A - Wet Chem	1	Kingston	ach	08-Jun-22	A-TPTKN-001 (P)(k)	E3516.2
Total Suspended Solids	2	Kingston	TK	09-Jun-22	A-TSS-001 (k)	SM2540D
Comment	1	Default Site	CS	08-Jun-22	C-Arochlor Comment	-
BOD	1	Kingston	JWF	08-Jun-22	C-BOD-001 (k)	SM 5210B
SVOC	1	Kingston	esi	10-Jun-22	C-NAB-W-001 (k)	EPA 8270
Oil & Grease	1	Kingston	MTY	09-Jun-22	C-O&G-001 (k)	SM 5520
PCB's	1	Kingston	CS	08-Jun-22	C-PCB-03 K	EPA 8082
Phenolics (4-aap)	1	Kingston	kwe	08-Jun-22	C-PHEN-01 (k)	MOEE 3179
VOC's	1	Richmond Hill	FAL	07-Jun-22	C-VOC-02 (rh)	EPA 8260
Chromium (VI)	2	Holly Lane	CWp	16-Jun-22	D-CRVI-01 (o)	MOE E3056
Mercury	2	Holly Lane	PBK	13-Jun-22	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	2	Holly Lane	NHG	13-Jun-22	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	2	Holly Lane	TPR	09-Jun-22	D-ICPMS-01 (o)	EPA 200.8
Subcontracted	1	Default Site	CWp	15-Jun-22	S-Nonylphenols	Subcontract

Mississauga Storm Sewer - Mississauga Storm Sewer Guidelines
Mississauga - Storm Sewer - City of Mississauga Storm Sewer Guidelines

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Mississauga Storm Sewer	
	Sample I.D.		B22-16928-1	B22-16928-2			Mississauga - Storm Sewer	
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.20				9.0	
BOD(5 day)	mg/L	3	< 3				15	
Cyanide (Total)	mg/L	0.005	< 0.005				0.02	
Fluoride	mg/L	0.1	< 10					
Total Kjeldahl Nitrogen	mg/L	0.1	**6.2**				1	
Oil and Grease-Anim/Veg. (Calculation)	mg/L	1.0	< 1.0					
Oil and Grease-Mineral	mg/L	1.0	< 1.0					
Oil & Grease-Total	mg/L	1.0	< 1.0					
Phenolics	mg/L	0.001	< 0.001				0.008	
Phosphorus-Total	mg/L	0.01	**1.14**				0.4	
Total Suspended Solids	mg/L	3	**250**	7			15	
Aluminum (total)	mg/L	0.01	**3.27**	0.10			1.0	
Antimony	mg/L	0.0001	0.0004	0.0002				
Arsenic	mg/L	0.0001	0.0023	0.0013			0.02	
Cadmium	mg/L	0.005	< 0.005	< 0.005			0.008	
Chromium	mg/L	0.002	0.004	< 0.002			0.08	
Chromium (VI)	mg/L	0.01	< 0.01 [1]	< 0.01 [1]			0.04	
Cobalt	mg/L	0.005	0.013	0.010				
Copper	mg/L	0.002	0.029	0.020			0.04	
Lead	mg/L	0.02	< 0.02	< 0.02			0.12	
Manganese (Total)	mg/L	0.001	**2.44**	**2.48**			0.05	
Mercury	mg/L	0.00002	0.00004	0.00004			0.0004	
Molybdenum	mg/L	0.01	< 0.01	< 0.01				

Mississauga Storm Sewer - Mississauga Storm Sewer Guidelines
Mississauga - Storm Sewer - City of Mississauga Storm Sewer Guidelines

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Mississauga Storm Sewer	
	Sample I.D.		B22-16928-1	B22-16928-2			Mississauga - Storm Sewer	
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
Nickel	mg/L	0.01	< 0.01	< 0.01			0.08	
Selenium	mg/L	0.001	0.004	0.004			0.02	
Silver	mg/L	0.0001	< 0.0001	< 0.0001			0.12	
Sulphate	mg/L	1	219					
Chloroform	mg/L	0.001	< 0.001					
Dichlorobenzene,1,2-	mg/L	0.0005	< 0.0005					
Dichlorobenzene,1,4-	mg/L	0.0005	< 0.0005					
Dichloroethene, cis-1,2-	mg/L	0.0005	< 0.0005					
Dichloropropene, trans-1,3-	mg/L	0.0005	< 0.0005					
Ethylbenzene	mg/L	0.0005	< 0.0005				0.002	
Silver	mg/L	0.005	< 0.005	< 0.005			0.12	
Tin	mg/L	0.05	< 0.05	< 0.05				
Titanium	mg/L	0.005	0.063	< 0.005				
Zinc	mg/L	0.005	0.019	< 0.005			0.04	
Benzene	mg/L	0.0005	< 0.0005				0.002	
Dichloromethane (Methylene Chloride)	mg/L	0.005	< 0.005					
Tetrachloroethane,1,1,2,2-	mg/L	0.0005	< 0.0005					
Tetrachloroethylene	mg/L	0.0005	< 0.0005					
Toluene	mg/L	0.0005	< 0.0005				0.002	
Trichloroethylene	mg/L	0.0005	< 0.0005					
Xylene, m,p,o-	mg/L	0.0011	< 0.0011				0.0044	

Mississauga Storm Sewer - Mississauga Storm Sewer Guidelines
Mississauga - Storm Sewer - City of Mississauga Storm Sewer Guidelines

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Mississauga Storm Sewer	
	Sample I.D.		B22-16928-1	B22-16928-2			Mississauga - Storm Sewer	
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
Xylene, m,p-	µg/L	1.0	< 1.0					
Xylene, o-	µg/L	0.5	< 0.5					
Poly-Chlorinated Biphenyls (PCB's)	mg/L	0.00005	< 0.00005					
Aroclor	-		-					
Methyl Ethyl Ketone	mg/L	0.02	< 0.02					
Styrene	mg/L	0.0005	< 0.0005					
Nonylphenols	mg/L	0.001	< 0.001 [2]					
Nonylphenol Ethoxylates	mg/L	0.01	< 0.01 [2]					
Nonylphenol Monoethoxylate	µg/L	10	< 10 [2]					
Nonylphenol Diethoxylate	µg/L	10	< 10 [2]					
Bis(2-ethylhexyl) Phthalate	mg/L	0.005	< 0.005					
Di-n-butyl Phthalate	mg/L	0.001	< 0.001					
Total PAH	mg/L	0.0001	< 0.0001				0.002	
Acenaphthene	µg/L	0.05	< 0.05					
Acenaphthylene	µg/L	0.05	< 0.05					
Anthracene	µg/L	0.05	< 0.05					
Benzo(a)anthracene	µg/L	0.05	< 0.05					
Benzo(a)pyrene	µg/L	0.01	< 0.01					
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1					
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05					
Chrysene	µg/L	0.05	< 0.05					

Mississauga Storm Sewer - Mississauga Storm Sewer Guidelines
Mississauga - Storm Sewer - City of Mississauga Storm Sewer Guidelines

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

	Client I.D.		MW5	MW5 - filtered			Mississauga Storm Sewer	
	Sample I.D.		B22-16928-1	B22-16928-2			Mississauga - Storm Sewer	
	Date Collected		06-Jun-22	06-Jun-22				
Parameter	**Units**	**R.L.**						
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05					
Fluoranthene	µg/L	0.05	< 0.05					
Fluorene	µg/L	0.05	< 0.05					
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05					
Methylnaphthalene,1-	µg/L	0.05	< 0.05					
Methylnaphthalene,2-	µg/L	0.05	< 0.05					
Naphthalene	µg/L	0.05	< 0.05					
Phenanthrene	µg/L	0.05	< 0.05					
Pyrene	µg/L	0.05	< 0.05					

1 . Chromium (VI) result is based on total Chromium

2 . Subcontracted to SGS Lakefield

Mississauga Storm Sewer - Mississauga Storm Sewer Guidelines
Mississauga - Storm Sewer - City of Mississauga Storm Sewer Guidelines

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B22-16928

Rev. 1

Report To:

GEI Consultants
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Shirley Li

Caduceon Environmental Laboratories
110 West Beaver Creek Rd Unit 14
Richmond Hill ON L4B 1J9
Tel: 289-475-5442
Fax: 289-562-1963

DATE RECEIVED: 06-Jun-22
DATE REPORTED: 16-Jun-22
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: 1225 Dundas
P.O. NUMBER: 2202029
WATERWORKS NO.

Summary of Exceedances

City of Mississauga Storm Sewer Guidelines		
MW5	Found Value	Limit
Total Suspended Solids (mg/L)	250	15
Total Kjeldahl Nitrogen (mg/L)	6.2	1
Phosphorus-Total (mg/L)	1.14	0.4
Manganese (Total) (mg/L)	2.44	0.05
Aluminum (total) (mg/L)	3.27	1.0
MW5 - filtered	Found Value	Limit
Manganese (Total) (mg/L)	2.48	0.05

Mississauga Storm Sewer - Mississauga Storm Sewer Guidelines
Mississauga - Storm Sewer - City of Mississauga Storm Sewer Guidelines

Christine Burke
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured

TESTING REQUIREMENTS

- ☐ O.Reg 153 — Table ____ — ☐ Medium/Fine ☐ Coarse — ☐ MISA Guidelines
- ☐ RPI ☐ ICC — ☐ Agricultural (O.Reg 153) — ☐ O.Reg 558 Leachate Analysis
- ☐ Yes ☐ No — Record of Site Condition (O.Reg 153) — Disposal Site: ____
- ☐ Provincial Water Quality Objectives — ☐ Landfill Monitoring
- ☒ Sewer Use By-Law: Mississauga/Peel — ☐ Other: ____

REPORT NUMBER (Lab Use): BJJ-16928

Are any samples to be submitted intended for Human Consumption under any Drinking Water Regulations? ☐ Yes ☒ No (If yes, submit all Drinking Water Samples on a Drinking Water Chain of Custody)

Indicate Laboratory Samples are submitted to: ☐ Kingston ☐ Ottawa ☑ Richmond Hill ☐ Windsor ☒ Barrie ☐ London

Organization: GEI Consultants	**Address and Invoicing Address (if different):** 647 Welham Road, Unit 14, Barrie, Ontario, L4N 0B7
Contact: Shirley Li	
Tel: 6479620307	
Fax: -	**Quote No.:** 2021_EPD
Email: sli@geiconsultants.com	**P.O. No.:** 220209
	Project Name: 1225 Dundas St E, Mississauga
	Additional Info: -

ANALYSES REQUESTED (Print Test in Boxes)

Mississauga/Peel Sewer Use By-Law | Metals Suite 2 | TSS | Suspected Highly Contaminated

TURNAROUND SERVICE REQUESTED (see back page)

- ☐ Platinum 200% Surcharge
- ☐ Gold 100% Surcharge
- ☐ Silver 50% Surcharge
- ☐ Bronze 25% Surcharge
- ☒ Standard 5-7 days
- ☐ Specific Date: ____

* Sample Matrix Legend: WW=Waste Water, SW=Surface Water, GW=Groundwater, LS=Liquid Sludge, SS=Solid Sludge, S=Soil, Sed=Sediment, PC=Paint Chips, F=Filter, Oil = Oil

Lab No:	Sample Identification	S.P.L.	Sample Matrix *	Date Collected (yy-mm-dd)	Time Collected	Indicate Test For Each Sample By Using A Check Mark In The Box Provided	✓	Field pH	Field Temp.	# Bottles/ Sample	Field Filtered(Y/N)
1	MW5	-	GW	22-06-06	AM	✓		-	-	B	N
2	MW5 — filtered	-	GW	22-06-06	AM	✓ ✓		-	-	4	Y
						→ ~~York~~ Peel Region Sanitary/Storm		-	-		-
								-	-		-
								-	-		-
								-	-		-
								-	-		-
	K → 1L amber (x3), gen chem, nutrients, phenols, CN (1,2)							-			-
	O → gen chem, metals, mercury,							-	-		-
	RH → VOC VIALS							-	-		-
	SGS → 1L NP/NPE							-	-		-
								-	-		-

SAMPLE SUBMISSION INFORMATION

	Sampled by:	Submitted by:
Print:	Shirley Li	Shirley Li
Sign:		
	22-06-06	22-06-06
	Date (yy-mm-dd)/Time:	Date (yy-mm-dd)/Time:

SHIPPING INFORMATION

- Client's Courier ☐
- Caduceon's Courier ☐
- Drop Off ☒
- Caduceon (Pick-up) ☐
- Invoice ☐
- # of Pieces

REPORTING / INVOICING

- Report by Fax ☐
- Report by Email ☒
- Invoice by Email ☒
- Invoice by Mail ☐

SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)

- Received By (print): SHERI — Signature:
- Date Received (yy-mm-dd): 22-06-06 — Time Received: 1145
- Laboratory Prepared Bottles: ☑ Yes ☐ No
- Sample Temperature °C: 12 — Labeled by:

Comments:

Page 1 of 1

G

White: Lab Copy / Yellow: Invoicing Copy / Pink: Client Copy

CofC, May 2019, Revision No: 22

Appendix F

Dewatering Calculations

Hydrogeological Investigation
1225 Dundas Street East - SmartCentre, Mississauga, ON
Project No.: 2202029

Equivalent Well Radius Method

Construction Dewatering

Inputs

Rs (m)	Ro (m)	H (m)	h (m)	k (m/s)	Trench Length, x (m)	Trench Width, b (m)
64.9	6.1	2.9	0.0	5.00E-07	135	98

Elevations (m)	
Ground Surface	120.3
Highest Water Level	118.16
Base of Excavation	115.3
Drawdown Target	115.3
Aquifer Bottom	115.3

Groundwater Flows		
Flow Rate, Q=	0.0002	m3/s
Q=	20,284	L/day
Safety Factor	2	
Q factored =	**40,567**	L/day

Precipitation		
Rainfall Event	10	mm
Excavation Area	13230	m2
Rainfall Q =	**132,300**	L/day

TOTAL Factored Q =	**172,867**	**L/day**

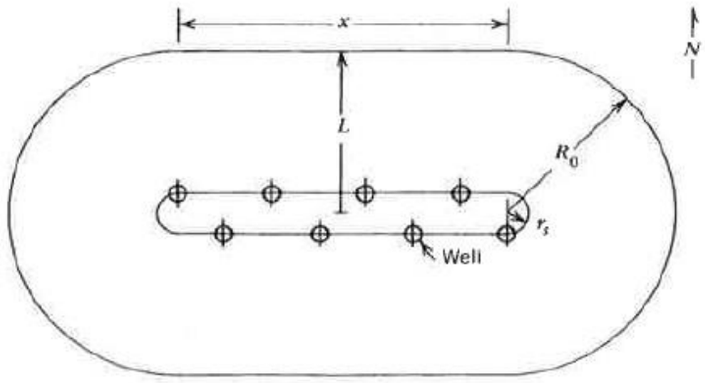


Figure 6.8 Approximate analysis of long, narrow systems.

of the actual system is finite, the end effects must be considered. This can be done by assuming that at each end of the system there is a flow equal to one half the flow to a circular well of radius r_s. The total flow to the system may be approximated by adding Eqs. 6.1 and 6.6 for a confined aquifer, or Eqs. 6.3 and 6.7 for a water table aquifer:

$$Q = \frac{2\pi KB(H - h)}{\ln R_0/r_s} + 2\left[\frac{xKB(H - h)}{L}\right] \qquad (6.10a)$$

$$Q = \frac{\pi K(H^2 - h^2)}{\ln R_0/r_s} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right] \qquad (6.10b)$$

Foundation Drain Flow Rate Estimate

1225 Dundas Street East

Permanent Dewatering Estimates

Description	Symbol	Value	Unit	Explanation
Input Data				
Ground Floor Elevation		120.2	m asl	Based on BH Logs
Highest Groundwater Level		118.2	m asl	Highest measured groundwater level
Lowest BFE		116.0	m bgs	P1 Slab @ 116 m
Aquifer Bottom		115.5	m asl	
Hydraulic Conductivity	K	5.00E-07	m/s	Highest K value
Length of Excavation	a	135.0	m	Based on Provided Architectrual Drawings
Width of Excavation	b	98.0	m	Based on Provided Architectrual Drawings
Output				
Top of Aquifer		118.2	m asl	Water Table for unconfined aquifer
Target Water Level		115.5	masl	Assumed 0.5 m below basement floor level
Water Level above aquifer bottom before dewatering	H	2.7	m	
Water Level above target water level	h	0.0	m	
Duration	t	31536000	s	Assumed 10 years
Copper-Jacob Radius of Influence	R_{cj}	10.8		
Effective Radius	r_e	74.2	m	
Radius of Influence	L (R_0)	85.0	m	Copper-Jacobs
Foundation Drain Flow Rate - Steady State	Q	7.1	m^3/day	Long-term flow rate - Dupuit Equation
Maximum Foundation Drain Flow Rate (safety factor of 2)	2Q	14.1	m^3/day	during the initial period and after rains
Estimated Long-term Foundation Drain Flow Rate		**7,100**	L/day	
Estimated Maximum Foundation Drain Flow Rate		**14,100**	L/day	

Appendix G

Water Taking Plan

Construction Dewatering Discharge Rate and Zone of Influence

The Radius of Influence and temporary dewatering discharge rate were estimated in Section 5.1 and the details are summarized below.

Location	Construction Dewatering Flow Rate Without Safety Factor	Construction Dewatering Flow Rate Including Safety Factor of 2	Construction Dewatering Flow Rate Including Safety Factor of 2 and a 10 mm Rainfall Event
	L/day	L/day	L/day
Construction Dewatering – One Level of Below Grade Parking	20,284	40,567	172,867

Potential Settlement and Monitoring

Based on the borehole results and groundwater level measurements, the groundwater table is at approximately Elev. 116.9 to 118.2 m, or about 2.1 to 3.5 metres below grade, and is entirely within the bedrock formation. There will be no drawdown of groundwater from the soil overburden, and therefore no increases in effective stress within the soil from reducing the pore water pressures. The bedrock will not settle due to dewatering activities. There will be no settlement related impacts to nearby lands, structures, or buried utilities.

Another cause of significant dewatering related settlement is due to pumping of fines through the system. It is imperative that any dewatering systems shall be designed and installed adequately to ensure no soil is conveyed through the system. Sufficient filtering techniques are incorporated at the entry point to avoid migration fines in the pumping/dewatering system.

Potential Impact on Other Water Users

The site lies within an urban area of Mississauga, based on the MECP Water Well Record database, no supply water wells were identified. Given the area is serviced by municipal system, no private well water user is expected. There are no potential impacts to nearby groundwater users due to construction dewatering or long-term dewatering is expected.

Reduction of Ground Water Flow to Waterbodies

Little Etobicoke Creek lies approximately 400 m north of the site, which is outside of the anticipated ROI. Further the dewatering will be of short duration and the water removed will ultimately return to watershed after treatment and discharge. Therefore, it is not anticipated that the construction dewatering will negatively impact the groundwater flow to Little Etobicoke Creek and/or Etobicoke Creek.

Water Quantity, Quality and Ground Water Level Monitoring Program

If the dewatering discharge water is treated by filtration (a silt bag at a minimum) to remove sediment and fines, the water quality is expected to improve to meet the applicable Sewer Use By-Law Criteria.

Discharge Options

Based on the results of the water quality analyses of the discharge, the following dewatering discharge options can be selected in the order of preference:

i. Discharge to existing storm sewers, provided water quality results comply with the applicable Storm Sewer Use By-Law Criteria.
ii. Discharge to existing sanitary sewers, provided water quality results comply with the applicable Sanitary Sewer Use By-Law Criteria.

If the groundwater quality of the construction dewatering discharge does not meet the applicable standards treatment options should be evaluated and/or the system should be shut down.

Water Quality Monitoring and Potential Treatment Plan

The monitoring plan for discharge to storm sewer system is outlined on Table G-1.

Ground Water Level Monitoring Program

The ground water level monitoring program is outlined on Table G-1.

Discharge Rate Monitoring

In accordance with O.Reg.63/16 daily ground water takings are to be measured and recorded by the dewatering contractor using a flow measuring device.

For each day of water taking a total daily water taking volume must be recorded. All water taking volumes for the duration of the EASR must be submitted annual through the MECP online reporting system.

Summary of Qualifications

Alicia Kimberley, MSc, P.Geo.

Ms. Alicia Kimberley is a licensed professional geoscientist with a Bachelor's and Master's degree in Earth Sciences from McMaster University and the University of Waterloo, respectively. She has eight years of professional experiences with geoenvironmental and hydrogeological assessments.

Her experiences include the design and execution of aquifer testing, in-situ ground water sampling, groundwater modelling, and preparation of hydrogeological reports to support PTTW reports.

Date of Plan Preparation

This plan prepared on the date June 24, 2022.

TABLE G-1
WATER QUALITY MONITORING PLAN FOR DEWATERING DISCHARGE TO A STORM OR SANITARY SEWER[1,2]

Period	Monitoring Location	Parameters[3]	Monitoring Frequency	Trigger For Mitigation	Mitigation Measures / Comments
Trial Dewatering	Dewatering discharge	○ City of Mississauga Storm Sewer Use By-Law Criteria ○ Region of Peel Storm and Sanitary Sewer Use By-Law Criteria	Once during trial dewatering	Exceeds the applicable Storm and/or Sanitary Sewer Use By-Law Criteria	Modify treatment method and/or shut down.
During Construction	Dewatering discharge	○ City of Mississauga Storm Sewer Use By-Law Criteria ○ Region of Peel Storm and Sanitary Sewer Use By-Law Criteria	Weekly then every four weeks after 3 consecutive weekly compliant samples[3]	Exceeds the applicable Storm and/or Sanitary Sewer Use By-Law Criteria	Change treatment method and/or shut down.
		○ Turbidity	Daily until stable (minimum 5 samples) then weekly[3]	Exceeds 15 NTU.	
	Discharge point	○ Impact Assessment	At each sampling event	Sedimentation, erosion	Reduce pumping and/or improve sediment/erosion control measures

Notes:
(1) It is recommended that discharge be treated by a sediment control facility such as a decantation tank or filtration bags.
(2) Parameters may be removed from future testing after three consecutive compliant results and with agreement by QP. If dewatering moves to a different location all initial parameters must be retested.
(3) If dewatering moves to a different location or a non-compliant result is detected, the sampling will return to the initial frequency.

Appendix H

Discharge Plan

Construction Dewatering Discharge Rate and Zone of Influence

The Radius of Influence and temporary dewatering discharge rate were estimated in Section 5.1 and the details are summarized below.

Location	Construction Dewatering Flow Rate Without Safety Factor	Construction Dewatering Flow Rate Including Safety Factor of 2	Construction Dewatering Flow Rate Including Safety Factor of 2 and a 10 mm Rainfall Event
	L/day	L/day	L/day
Construction Dewatering – One Level of Below Grade Parking	20,284	40,567	172,867

Proposed Discharge Method and Location

It is understood that the preferred discharge location would be to the existing storm and/or sanitary sewers. Dewatering discharge will be directed to the existing sewers by hose or pipe from the dewatering system to any pre-treatment systems (i.e. silt bag and/or sediment tank), and then by hose or pipe to the preferred discharge location.

In the event of a significant rainfall event (100-year storm event), on-site excavation will cease until the dewatering system can be re-evaluated and/or storm water flow subsides.

Erosion and Sediment Control Measures

The construction dewatering setup will include sediment and erosion control measures, and sufficient filtration to ensure removal of suspended solids prior to discharge in accordance with typical Best Management Practices.

Statements

If discharge is directed to the surface and/or existing storm sewers with adherence to the water quantity and quality monitoring program outlined in the Water Taking Plan in Appendix G, no adverse effect on the environment is expected.

The discharge water temperature was considered in determining the method of transfer and discharge and is not expected to have an adverse impact.

Summary of Qualifications

Alicia Kimberley, MSc, P.Geo.

Ms. Alicia Kimberley is a licensed professional geoscientist with a Bachelor's and Master's degree in Earth Sciences from McMaster University and the University of Waterloo, respectively. She has eight (8) years of professional experiences with geoenvironmental and hydrogeological assessments.

Her experiences include the design and execution of aquifer testing, in-situ ground water sampling, groundwater modelling, and preparation of hydrogeological reports to support PTTW reports.

Date of Plan Preparation

This plan prepared on the date June 24, 2022.