MASTER FUNCTIONAL SERVICING REPORT

RANGEVIEW DEVELOPMENT MASTER PLANS

CITY OF MISSISSAUGA
PROJECT 2020-4938 **SEPTEMBER 2023**

Revision	Description	Prepared		Checked	
		By	Date	By	Date
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1 INTRODUCTION

1.1 Objective and Location

Schaeffer and Associates Ltd. (SCE) has been retained to prepare a Master Functional Servicing Report (MFSR) to facilitate the design of the proposed municipal roads and infrastructure to service the Rangeview Development on Lakeshore Rd. East and Lakefront Promenade, in the City of Mississauga, Region of Peel. The proposed development herein referred to as 'Rangeview Development' falls within the jurisdictional boundary of the Credit Valley Conservation Authority (CVC).

The subject site is approximately 25.7 ha including public roadways and is bound by Lakeshore Road to the northwest, Hydro Rd. to the northeast, East Avenue to the southwest, and Lakeview Park and Douglas Kennedy Park to the southeast. A location plan is provided in **Figure 1.1**. The majority of the site currently consists of employment land. The master plan proposes future right-of-way (ROW), residential site plans, and park areas. The following sections of this report provide strategic information regarding the municipal servicing of the proposed re-developments.

1.2 Existing Site Conditions

Existing site conditions were reviewed using previous planning documents for the subject site. Under existing conditions, the site's land use is predominantly commercial and industrial employment lands. The site land area is also mostly paved impervious spaces (commercial and industrial) with some grassed landscaped areas within the municipal ROW. The site generally grades southwest, ultimately discharging to Lake Ontario.

A preliminary geotechnical and hydrogeological investigation was completed by DS Consultants Ltd (Dated September 22, 2023). This investigation revealed that the predominant underlying soils consist of silty clay till and clayey silt till. Based on the monitoring program carried out for the study, water levels were observed at depths within the range of 1.57 m to 1.64 meters as well as some dry readings in boreholes. As such, the proposed low-impact development (LID) should consider groundwater levels. Please see **Appendix A** for the preliminary geotechnical and hydrogeological report.

1.3 Background Studies and Documentation

The following material has been reviewed in order to identify environmental compliance, existing topography, target release rates, and stormwater management criteria, which govern the proposed development within the area of the subject land and form the basis of this report.

- *Development Requirements Manual*, Transportation and Works Department, City of Mississauga, dated November 2020
- *Stormwater Management Criteria*, Credit Valley Conservation, dated August 2012.
- *Lakeview Village Functional Servicing Report*, Lakeview Community Partners Ltd., dated June 2021.
- *Lakeview Village Drainage Drawings*, Urbantech., dated October 2022.

1.4 Proposed Development

Based on the current development plans for the site, the following development features have been considered:

- Twenty-eight (28) site plan catchments with a mix of residential units;
- Nine (9) Park Blocks;
- Additional public right of way (ROW);

The specific design of each of the proposed blocks is subject to change in the future; however, this report intends to establish the servicing requirements of the study area such that the aforementioned developments may be supported by existing infrastructure and to verify if there will be any requirements for necessary infrastructure improvements in the future. The details of the proposed servicing scheme are provided in the remainder of the report. Refer to **Figure 1.2** for the development plan (ultimate full buildout scenario with all site areas participating).

Access to the subject site is currently provided from Lakeshore Road East, Hydro Road, East Avenue, Lakefront Promenade, and Rangeview Road. It should be noted that the proposed development includes the existing public roads; Rangeview Road, Lakefront Promenade, and East Avenue. It is to note, road widening and road re-alignment may be required on Rangeview Road and East Avenue as per the Lakeview master plan. As shown in **Figure 1.2**, three (3) additional municipal ROW are proposed, one of the proposed municipal ROW is north of Rangeview Road,

parallel to Lakeshore Rd. East, connecting to East Avenue and Hydro Road (Street L). While the second proposed municipal ROW runs parallel with Lakefront Promenade on the east side, connecting to Lakeshore Rd. East and the future Lakeview Village development (Ogden Ave). The third proposed ROW will intersect Rangeview Road and connect to the Lakeview Village development (Street G).

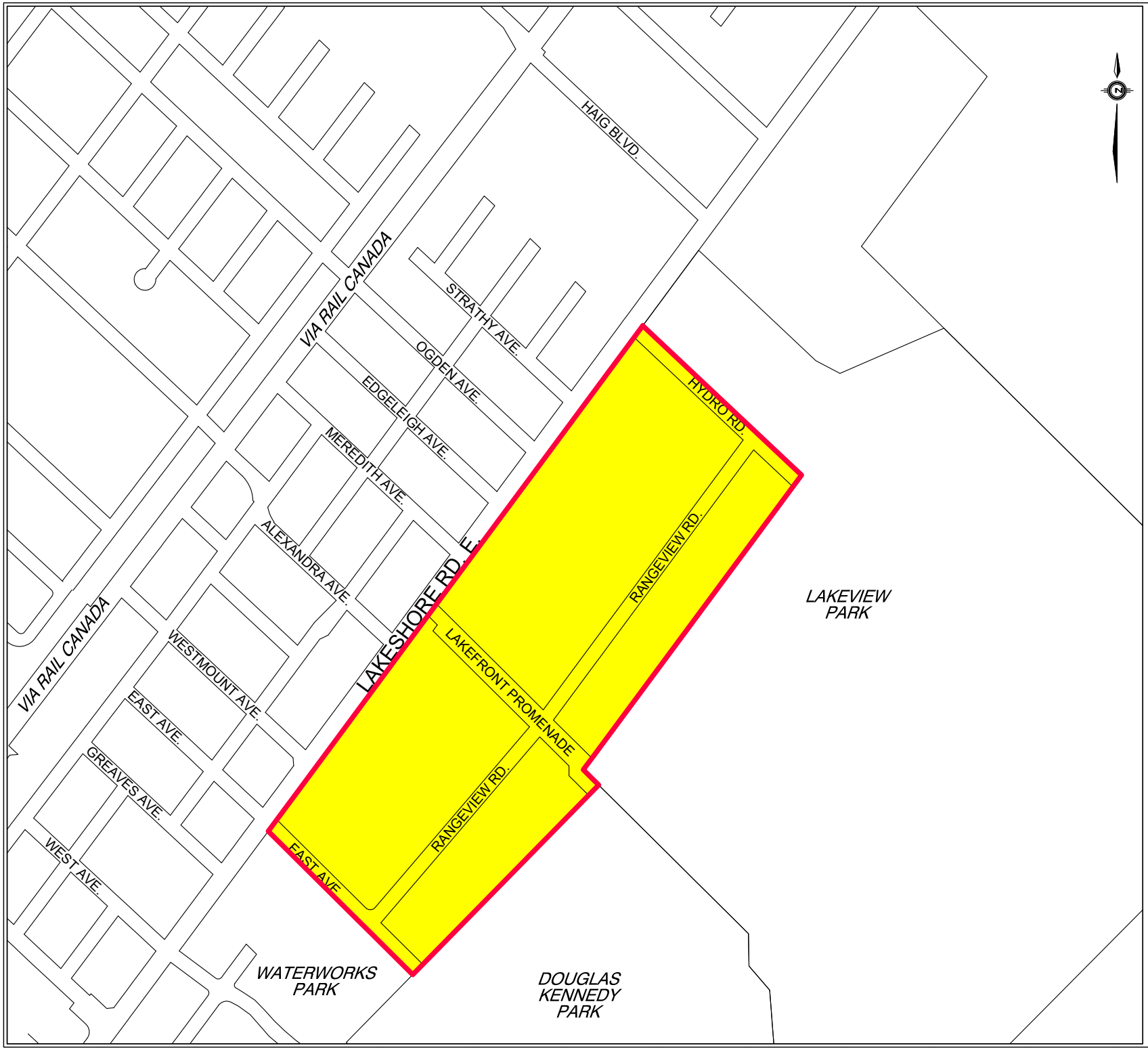
A summary of the approximate area of development and proposed unit count is presented in **Table 1-1** below. At the behest of the Region of Peel, a population density of 2.7 people/unit for apartments and 3.5 people/unit for townhouses was considered. The servicing sections below will discuss interim conditions based on cost sharing and participating land agreements and the ultimate condition in which all landowners are participating.

Table 1-1: Estimated Population

Parcel	**Parcel Area (Gross)**	*Townhouses*	*Apartment*	**Equivalent Population***			
		(Up to 4-Storey)	**(4-Storeys +)**	**Commercial + Institutional**	**Townhouses**	**Apartments**	**Total**
	ha	*Units*	*Units*	*persons*	*persons*	*persons*	***persons***
	21.94**	**576**	**4615**	**494**	**2,007**	**12,775**	**15,276**

** The population estimate was performed based on Peel Region criteria and correspondence with Peel Region. [2.7 persons per apartment unit and 3.5 persons per townhouse unit]*

***Area excludes East Avenue and Hydro Road Right of Way*



RANGEVIEW ESTATES PRECINCT AREA
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LEGEND

SUBJECT AREA

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FIGURE 1.1
LOCATION PLAN

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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FIGURE 1.2
PROPOSED DEVELOPMENT PLAN

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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2 WATER SUPPLY SERVICING

2.1 Existing Water Supply Servicing

The subject site is located in the Region's Pressure District 1 (PD1). Existing water supply infrastructure proximate to the subject site includes:

- 600 mm diameter CPP along Lakeshore Road East;
- 2,400 mm diameter CPP watermain along Lakeshore Road East and Lakeshore Promenade;
- 300 mm diameter PVC watermains along East Avenue and Hydro Road;
- 300 mm diameter PVC watermain along Rangeview Road from East Avenue to Lakefront Promenade; and,
- 250 mm diameter PVC watermain along Rangeview Road from Lakefront Promenade to Hydro Road.

The Lakeview Community, located to the south of the Rangeview development, is currently under construction. At the time the Rangeview development is to be constructed, it is expected that the water servicing infrastructure, including 400 mm diameter watermains proposed along Lakefront Promenade and Hydro Road, to service the Lakeview community will be constructed. **Figure 2.1** shows the existing watermain layout.

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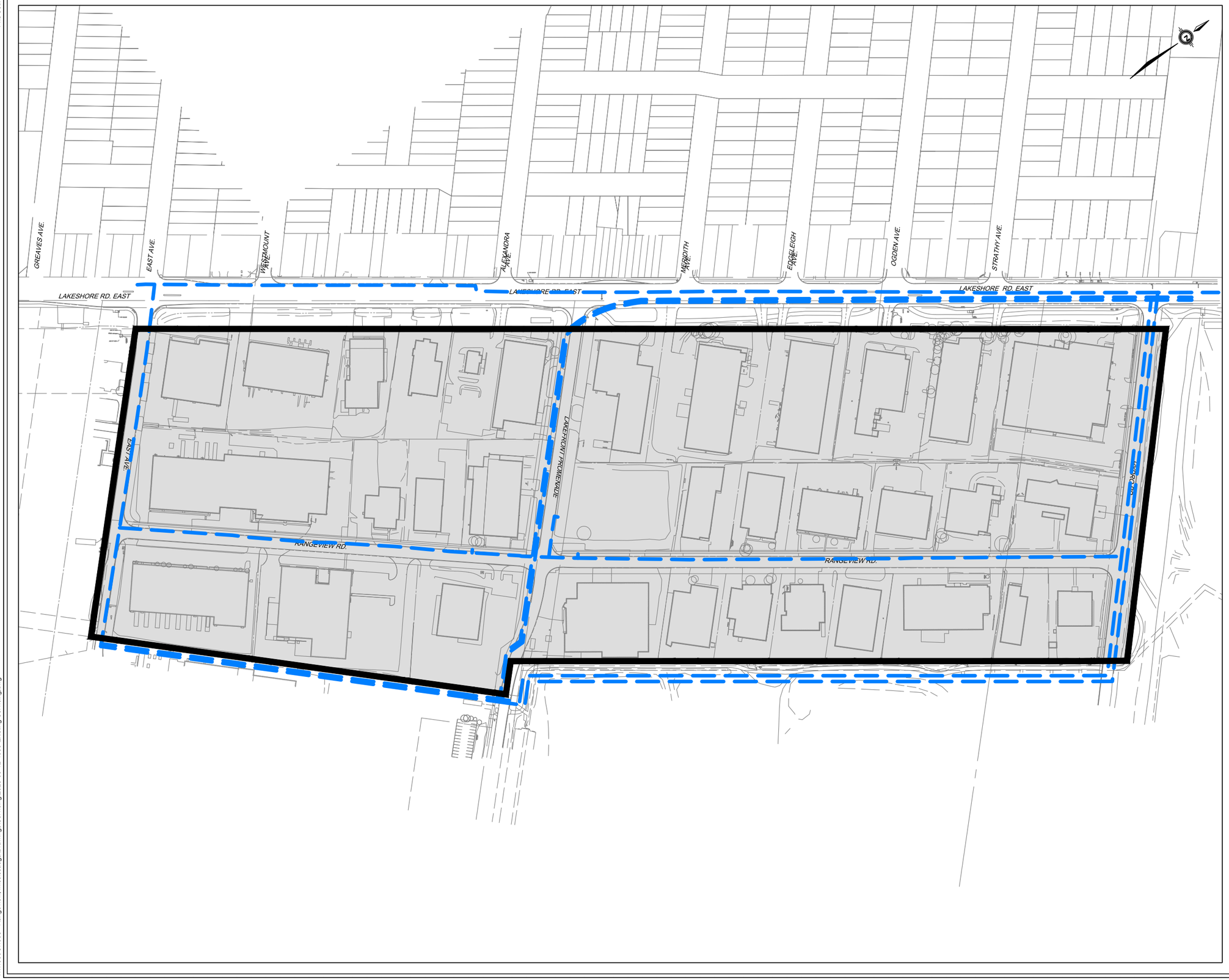

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EXISTING WATERMAIN

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FIGURE 2.1
EXISTING WATER SUPPLY SERVICES

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2.2 Water Supply Servicing Design Criteria

The following criteria were utilized in the design of the subject site's water distribution system:

- Region of Peel's Design, Specifications & Procedures Manual – Watermain Design Criteria (June 2010)
- Ministry of Environment, Conservation and Parks' (MECP) Design Guidelines for Drinking Water Systems (2019)
- City of Mississauga Development Requirements Manual (September 2016)
- Technical memorandum for the Lakeview Community development: "Lakeview Community – Water Modelling Methodology and Analysis" (TMIG, 2021) (Lakeview Community Technical Memorandum)
- E-mail correspondence with the Region

For fire flow demands, the Region's design guidelines do not provide a minimum fire flow demand for townhouses and apartment complexes. Furthermore, building construction and floor area data was not available, so Fire Underwriter Survey (FUS) methods could not be utilized to determine fire flow demands. As such, the City of Vaughan's Engineering Design Criteria & Standard Drawings (December 2020) were referenced for fire flow demand requirements. Once architectural plans become available, calculations shall be performed per FUS standards and the fire flow analysis shall be updated accordingly. For the Lakeview Community south of the subject site, fire flow demands were based on the technical memorandum for the Lakeview Community development, "Lakeview Community – Water Modelling Methodology and Analysis" (TMIG, 2021), and can be referred to in **Appendix B**.

- Equivalent population density of 3.5 persons per unit for townhouses and 2.7 persons per unit for apartments, per e-mail correspondence with the Region (refer to **Appendix B**);
- Equivalent population density of 175 persons per hectare for townhouses and 475 persons per hectare for apartments
- Average Day Demand of 280 L/capita/day for residential developments and 300 L/capita/day for institutional, commercial, and industrial (ICI) developments;

- For residential land use, the Maximum Day Demand and Peak Hour Demand peaking factors shall be 2.0 and 3.0, respectively;
- For commercial land use, the Maximum Day Demand and Peak Hour Demand peaking factors shall be 1.4 and 3.0, respectively;
- Minimum Fire Flow Demand of 317 L/s for multi-unit apartment buildings per City of Vaughan Engineering Design Criteria & Standard Drawings (December 2020)
- Fire Flow Demand of 300 L/s for all buildings within the Lakeview Community development per Technical Memorandum: Lakeview Community – Water Modelling Methodology and Analysis (TMIG, 2021)
- The system shall be designed to provide sufficient flow and pressure to meet the greater of the Fire Flow plus Maximum Day Demand, or the Peak Hourly Demand;
- The minimum pressure under any non-fire demand scenario shall not be less than 275 kPa (40 psi). The minimum residual pressure during the Fire Flow plus Maximum Day Demand scenario shall not be less than 140 kPa (20 psi) at any location in the water distribution system;
- Hazen-Williams coefficients below table:

Pipe Diameter (mm dia.)	Hazen-Williams 'C' Coefficient
150	100
200-250	110
300-600	120
Over 600	130

2.3 Proposed Water Supply Servicing Plan

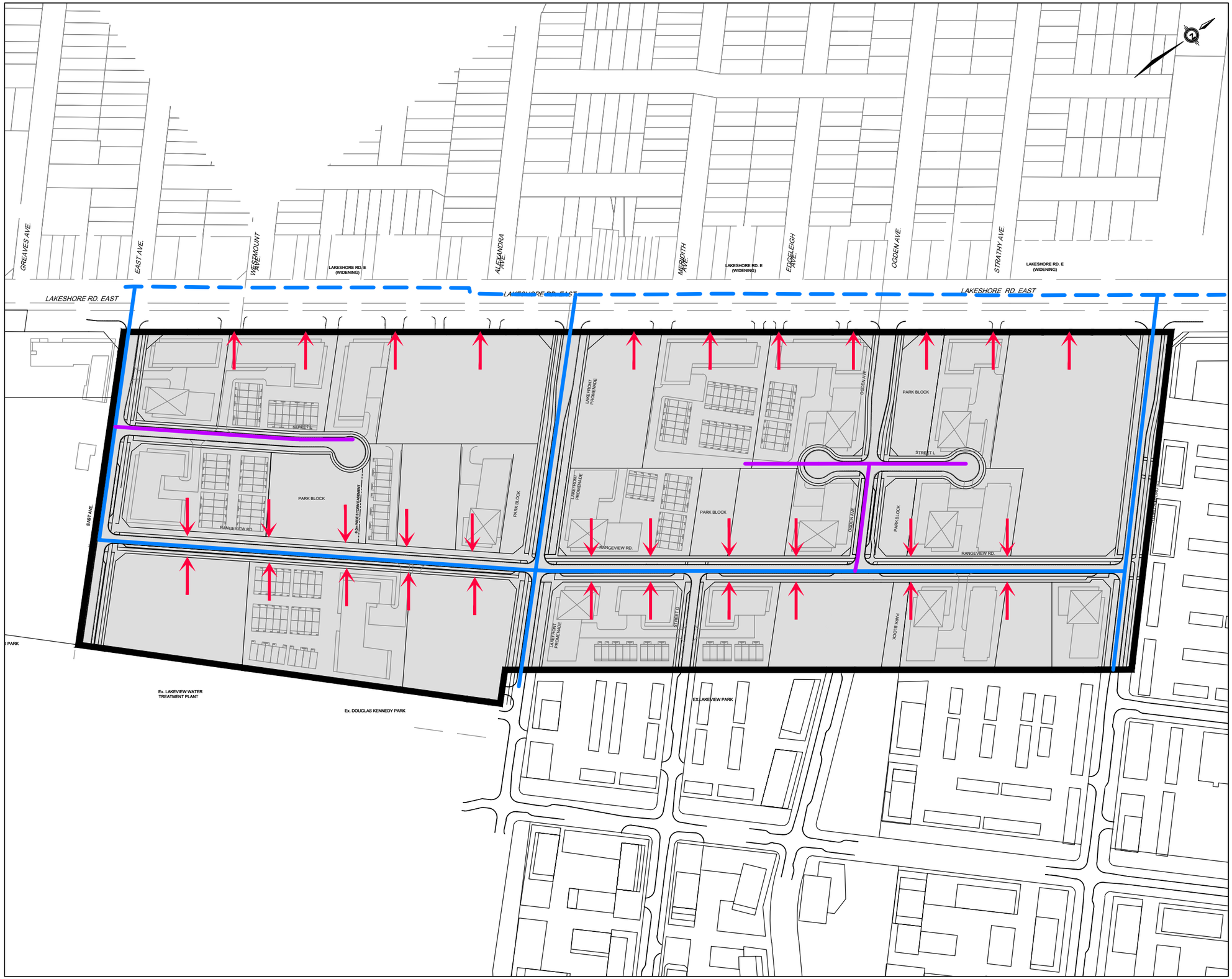
2.3.1 Interim Scenario

Under the interim scenario, infrastructure cannot be built along the entirety of Street 'L' due to the presence of non-participating landowners within the Rangeview site. As a result, 2 alternatives shall be considered for water supply servicing under interim conditions. Option 1 involves servicing the parcels fronting Rangeview Road via existing 250 mm diameter and 300 mm

diameter watermains along Rangeview Road. Parcels fronting Lakeshore Road East shall be serviced directly from the existing 600 mm diameter watermain along Lakeshore Road East. Option 2 involves servicing the parcels fronting Lakeshore Road East by connecting the existing Rangeview Road watermains to 300 mm diameter watermains along the reaches of Street 'L' where only participating landowners are present. Temporary easements would be required to loop these watermains back to Rangeview Road to limit dead-ends in the system. Parcels fronting Rangeview Road would be serviced via existing 250 mm diameter and 300 mm diameter watermains along Rangeview Road. Watermains connecting the Rangeview and Lakeview developments along Street 'G" and Ogden Avenue are not required for the system to be compliant with design guidelines, and thus these connections have been excluded. Water supply analysis of the interim water servicing scenario will be completed once the participating and non-participating landowners are confirmed. Refer to **Figure 2.2** and **Figure 2.3** depicting the proposed watermain layouts for interim scenario options 1 and 2, respectively.

2.3.2 Ultimate Scenario

The subject site is proposed to be serviced by connecting to existing watermains along Lakeshore Road East, Rangeview Road and East Avenue, as well as the 400 mm diameter watermain along Lakefront Promenade proposed as part of the Lakeview Community development. It is proposed to connect the watermains along Rangview Road and Street "L" to a new 300 mm diameter watermain along Hydro Road, as opposed to the 400 mm watermain proposed as part of the Lakeview Community development. A 300 mm diameter watermain is proposed along Street 'L', extending from East Avenue to Hydro Road. In addition, a 300 mm diameter watermain is proposed along Ogden Avenue, connecting to the existing 600 mm diameter watermain along Lakeshore Road East and the existing 250 mm diameter watermain along Rangeview Road. Watermains connecting the Rangeview and Lakeview developments along Street 'G" and Ogden Avenue are not required for the system to be compliant with design guidelines, and thus these connections have been excluded. Refer to **Figure 2.4** depicting the proposed watermain layout for the ultimate scenario.



RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

LEGEND

SUBJECT AREA

PROPOSED WATERMAIN

PROPOSED CLOSED WATERMAIN IN INTERIM CONDITION

EXISTING WATERMAIN

DIRECTION OF SERVICE CONNECTION

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FIGURE 2.2
INTERIM
WATER SUPPLY SERVICES - OPTION 1

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RANGEVIEW ESTATES PRECINCT AREA
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- SUBJECT AREA
- PROPOSED WATERMAIN
- TEMPORARY EASEMENT
- EXISTING WATERMAIN

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FIGURE 2.3
INTERIM
WATER SUPPLY SERVICES - OPTION 2

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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RANGEVIEW ESTATES PRECINCT AREA
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LEGEND

- SUBJECT AREA
- PROPOSED WATERMAIN
- EXISTING WATERMAIN



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FIGURE 2.4
ULTIMATE
WATER SUPPLY SERVICES

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2.4 Water Demands

Water demands for the proposed development were calculated based on Rangeview site statistics provided by Bousfields Inc., dated July 17, 2023. Equivalent populations were calculated using 2 population density methods: population per hectare, per the Region's Design, Specifications & Procedures Manual – Watermain Design Criteria (June 2010), and population per unit type, per correspondence with the Region on October 3, 2022. The equivalent population calculated using unit type yielded a higher value, thus, to be conservative this value was carried forward for water demand calculations.

Water demands for the Lakeview Community south of the subject site and external lands east of the subject site were calculated using population data from the Lakeview Community Technical Memorandum (TMIG, 2021). Per capita water demands and peaking factors were updated to reflect the latest Region design standards.

Table 2-1 below summarizes the water demands for the Rangeview development. Refer to the detailed water demand calculations for the Rangeview development, Lakeview Community, and external lands in **Appendix B.**

Table 2-1: Summary of Water Demands – Rangeview Development

Land Use	Equivalent Population	Demand			Fire Flow
		Average Day	Max Day	Peak Hour	
		L/s	*L/s*	*L/s*	*L/s*
Residential	15,276	49.51	99.01	148.52	317

2.5 Hydraulic Modeling

An InfoWater model was prepared using elevation data from the Lakeview Community Technical Memorandum (TMIG, 2021) and the latest grading plan by SCE. Demands were assigned to the nearest junction within the proposed development.

The following boundary condition was assumed for the water supply analysis:

- The boundary condition utilized in the hydraulic model was sourced from a hydrant test

completed by EBAL Engineering Ltd. on April 23, 2021. The hydrant test, performed at 1000 Lakeshore Road East, Mississauga, yielded a static pressure of 82 psi. The boundary condition was modeled as a fixed-head reservoir with a head of 144.11 m, calculated as the sum of the ground elevation at the residual hydrant of 86.44 m (per the latest grading plan) and the measured static pressure of 82 psi (57.67 m head). Refer to **Appendix B** for the hydrant test results and analysis.

The InfoWater model was used to analyze the post-development system under the following demand scenarios: Average Day Demand, Maximum Day Demand, Peak Hour Demand, and Maximum Day plus Fire Flow Demand. The modeling results demonstrate the water supply system can provide sufficient pressure and flow to the proposed development under normal operational and fire flow scenarios in accordance with MECP and Region design guidelines.

Table 2-2 below summarizes the pressures for each demand scenario. Detailed model outputs are provided in **Appendix B**.

Table 2-2: Summary of Modelled System Pressures

Scenario	**Minimum Pressure** (psi)	**Maximum Pressure** (psi)
Average Day	81.98	96.58
Maximum Day	81.98	95.80
Peak Hour	81.98	94.20

Fire flow (Max Day plus Fire Flow Demand) scenario modeling showed that a minimum residual pressure of 20 psi could be maintained for all nodes in the system proximate to the subject site. **Table 2-3** below summarizes the pressure range under the Maximum Day plus Fire Flow scenario.

Table 2-3: Pressure Range (MDD plus Fire Flow Scenario)

	Minimum Pressure (psi)	**Maximum Pressure** (psi)
Node ID (Min/Max Location)	J124	J152
Residual Pressure	54.87	89.85

2.6 Water Age Analysis

A water age analysis was performed to ensure the proposed system is compliant with water age guidelines. Water turnover was calculated for the entirety of the modeled network as there are no proposed watermains that terminate at dead ends.

To be conservative, an occupancy rate of 20% and the minimum consumption rate (70% of the average day demand) were assumed for the purposes of calculating water age. Given these parameters, a water age of 0.47 days was determined for the entirety of the Rangeview and Lakeview Community water supply systems. Per "Effects of Water Age on Distribution System Water Quality" (AWWA, 2002), a maximum water turnover rate of 3 days was observed in distribution systems. With a water age of 0.47 days, the proposed system is less than the maximum observed turnover rate and therefore meets water age requirements. Refer to the water age analysis in **Appendix B**.

3 SANITARY SERVICING

3.1 Existing Sanitary Servicing

The majority of the site discharges sanitary flow westerly to the Beach Street Pumping Station (PS) via the existing 250mmØ sewers along Rangeview Road and the existing 250mmØ sewer on East Avenue. The remainder of the site, which includes the lots east of Lakeshore Road East and Lakefront Promenade, discharges easterly to the G.E. Booth Wastewater Treatment Facility (WWTF) via the existing 300mmØ sewers along Lakeshore Road East.

It is to be noted that there is another pumping station (Beechwood SPS), located north of Lakeshore Road East and east of Enola Avenue.

For further details, reference can be made to **Figure 3.1** for the existing sanitary services.

3.2 Background Information

SCE previously completed a high-level downstream sanitary sewer analysis for the proposed lands, with an estimated population per parcel. The results of this analysis were presented in a meeting with the Region of Peel in April 2021. The Region recommended that all future flows from the proposed development lands were to be discharged to the Beechwood PS and none of the flows were to be discharged to the Beach Street PS or Lakeview PS. The Region informed SCE that the Beach Street PS would be decommissioned. Therefore, reliance on the Beach Street PS for ultimate servicing is not feasible. The Region further informed SCE that they would be commencing the design of a Capital Project to decommission the Beach Street PS and install a new sewer along Lakeshore Road East to direct the flow from the Beach Street PS to Beechwood PS.

SCE previously contacted the Region to determine if a preliminary design was completed for the proposed sewer located west of Rangeview Road. The Region informed SCE that the preliminary design of this new system has not progressed and design information is unavailable at this time. SCE completed a preliminary high-level analysis to determine if servicing the new trunk sewer on Lakeshore Road East would be feasible to connect to the Beechwood PS. Based on the collected information from the Region's plan and profile drawings, it was noted that connection would be feasible with a flat slope. Reference can be made to **Appendix C** for the profile for this new sewer.

3.3 Sanitary Design Criteria

Reference has been made to the Region of Peel Public Works Design, Specifications & Procedures Manual (March 2017) and correspondence from the Region for the sanitary servicing portion of

this report. Please note, the Region informed SCE that a density of 3.5 persons/unit and 2.7 persons/unit were to be considered for townhouses and apartments respectively. The relevant design criteria applicable to the development are summarized below:

- Average Domestic Flow — q = 302.80 L/person/day
- Infiltration Allowance — i = 0.20 L/s/ha
- Population (Townhouse) — P = 3.5 Persons/Unit
- Population (Apartment) — P = 2.7 Persons/Unit
- Population (Commercial) — P = 50 Persons/ha
- Population (Industrial) — P = 70 Persons/ha
- Harmon Peaking Factor — $M = [1+(14/(4+P(total)^{1/2}))]$

3.4 Proposed Sanitary Servicing Plan

3.4.1 Interim Conditions

Under the interim conditions, infrastructure cannot be built along the entirety of Street 'L' due to some of the non-participating landowners along Rangeview Road. Please note that the configuration of the sanitary servicing for the ultimate (full build-out) conditions is based on the interim conditions. The servicing for the interim conditions will be updated on the release of the phasing plan for the Rangeview Estates Development. Reference can be made to **Figure 3.2** for the interim serving plan.

It is to be noted that there are upgrades recommended during the ultimate conditions and once a phasing plan has been issued, an interim servicing plan can be completed to determine the capacity of the sewers at that stage.

3.4.2 Ultimate Conditions

During ultimate conditions, the site is proposed to service 33 parcels of high-rise buildings, townhouses, and commercial properties. The full build-out of the site is expected to have a design population of approximately 15,276 people. As seen in the ultimate servicing plan in **Figure 3.3**, all future sanitary flows from the site will discharge only to the proposed internal sewers located within the subject site. Therefore, there will be no future flows discharging into the existing sewers along Lakeshore Road East.

As discussed in the existing conditions section, a portion of the site discharges to the existing

sewers along Lakeshore Road East. Since flows from the proposed development will only discharge into the new sewers, located within the boundary of the site, the existing flows to the sewers along Lakeshore Road East will be eliminated. This will result in the Lakeshore Road East sewers having greater capacity than the existing conditions. In the event, the Rangeview Estates Development proposes to have more population, discharging some of the flow to the existing Lakeshore Road East sewers can be considered as a potential servicing option since there would be greater capacity.

3.4.3 Sanitary Demand

The proposed sanitary demand for the subject site is presented in the table below.

Table 3-1 Sanitary Demand

Site Discharge	Population	Average Demand (L/S)	Harmon's Peaking Factor	Flow (L/s)	Infiltration (L/s)	Total Peak Flow (L/s)
Townhouse	2007	7.03	3.58	25.21	4.39	**25.21**
Apartment	12775	44.77	2.85	127.53		**127.53**
Commercial	494	1.73	3.98	6.89		**6.89**
					Total Flow =	**164.01**

3.5 Downstream Capacity Analysis

A downstream sanitary sewer capacity analysis has been completed using theoretical design sheets to determine the pre-development and ultimate conditions. Reference has been made to the Region's design criteria to complete the downstream analysis. The purpose of the analysis is to analyze the capacity within the existing downstream sewers and determine if the existing infrastructure can support the flows from the proposed development. The outcome of this analysis will ensure that the sewers can safely convey the flow from the subject site to the outlet location.

Based on the ultimate servicing plan provided in **Figure 3.3**, the existing sewers along Rangeview Road will require upgrades to ensure that there is sufficient capacity to support the anticipated flows from future development. Approximately eight of the existing 250mmØ sewer legs, with a length of 642m, on Rangeview Road will require to be upgraded to 375mmØ and 450mmØ sewers. It is to be noted that a sub-trunk sewer, approximately 108 m) is proposed to be constructed along East Avenue (from Rangeview Road to Lakeshore Avenue East). This sub-trunk sewer is proposed to connect to the new trunk sewer on Lakeshore Avenue East, which, as previously discussed, will be designed and constructed by the Region. As per the design sheet analysis, the 205m sub trunk

sewer on East Avenue is required to be 525mmØ.

Reference can be made to **Appendix C** for the design sheet analysis.

Phil Gotfried



RANGEVIEW ESTATES PRECINCT AREA
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LEGEND

SUBJECT AREA

EXISTING SANITARY SEWER

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FIGURE 3.1
EXISTING SANITARY SERVICES

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RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

LEGEND

SUBJECT AREA

PROPOSED SANITARY SEWER

SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

FIGURE 3.2
INTERIM
SANITARY SERVICES

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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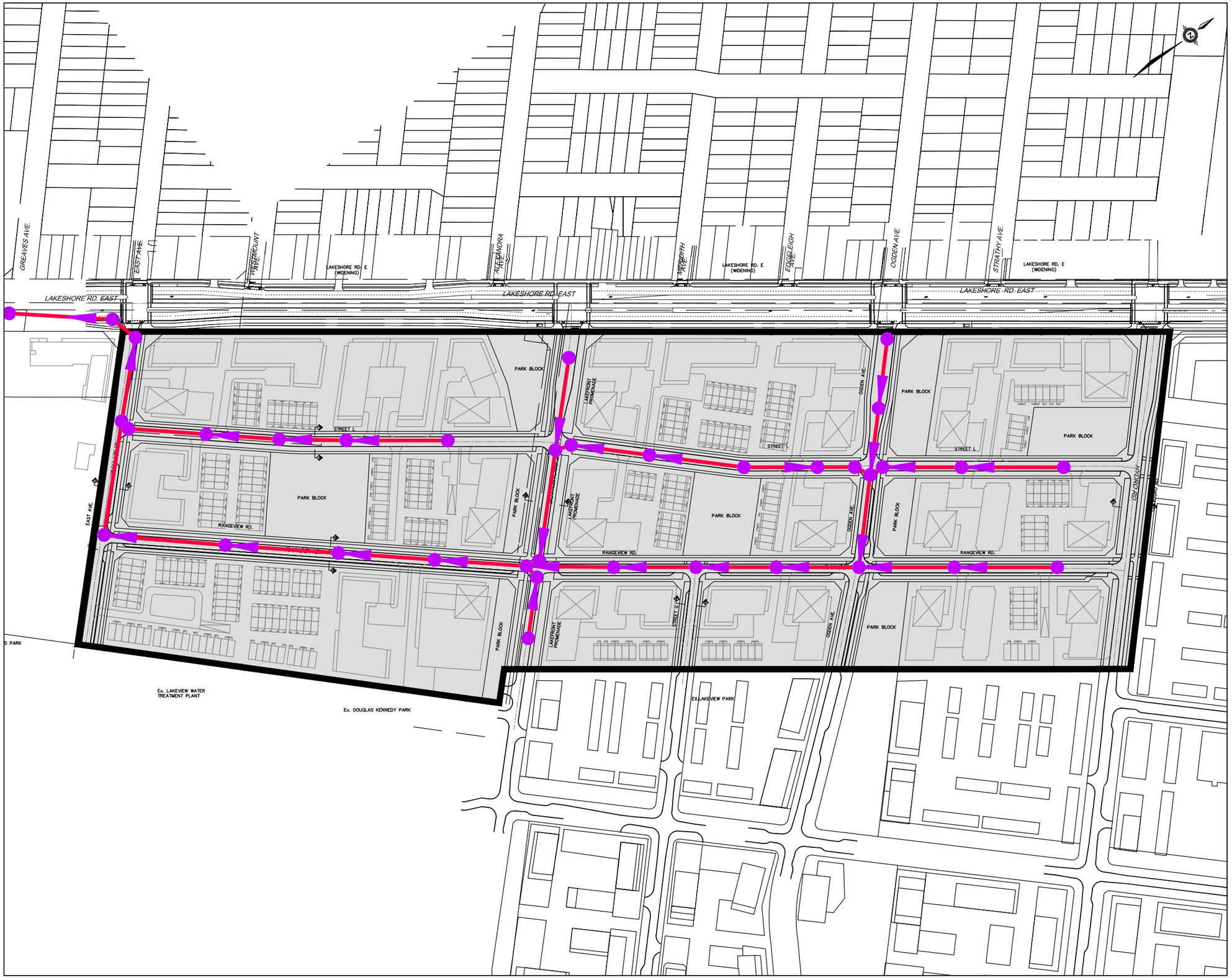
Logan Yule



RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

LEGEND

SUBJECT AREA

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FIGURE 3.3
ULTIMATE SANITARY
SERVICES

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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4 STORMWATER MANAGEMENT

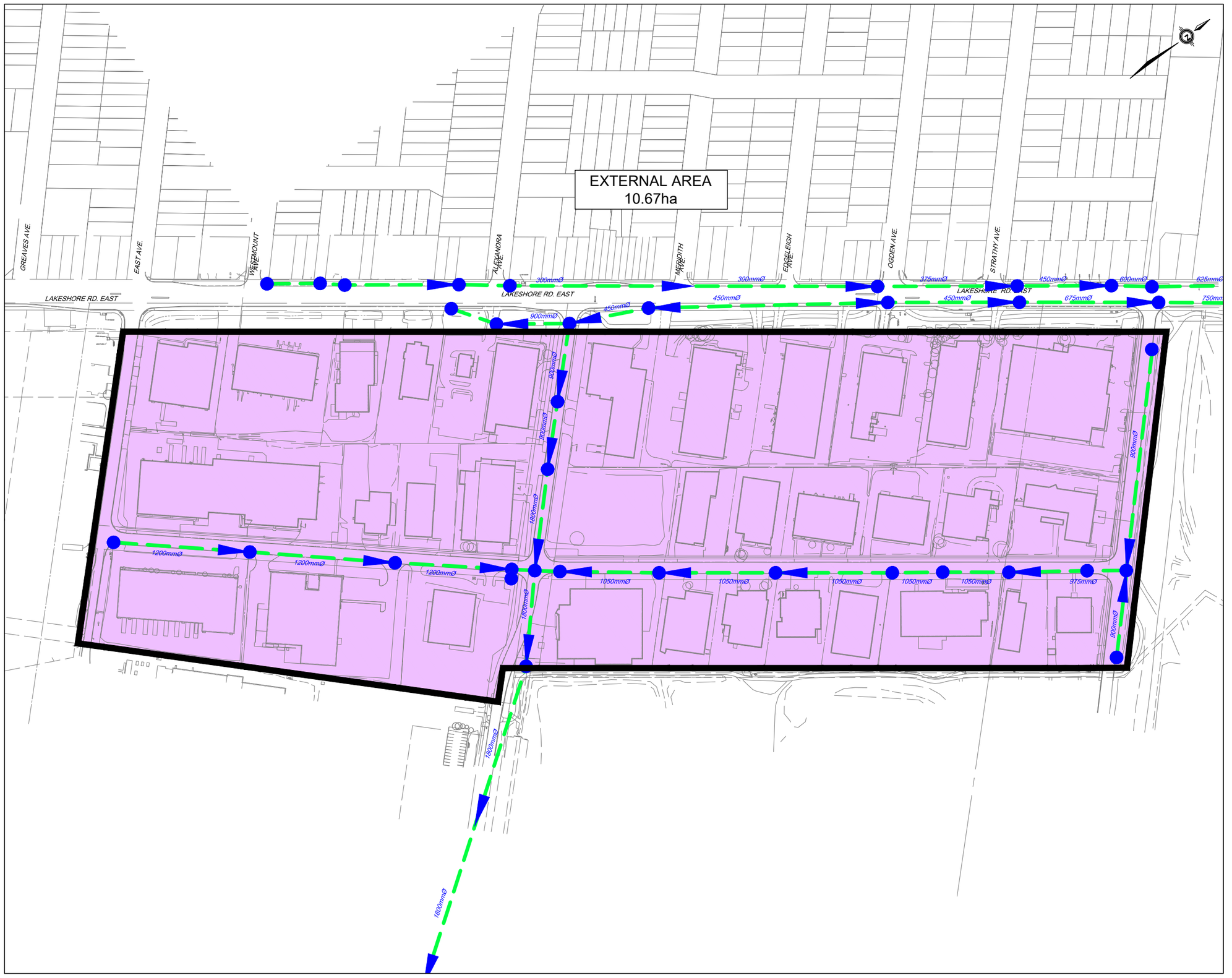
4.1 Existing Condition & Stormwater Infrastructure

The subject site is approximately 25.7 ha including municipal roadways, predominantly commercial and industrial area which is serviced by an existing major and minor system. Based on available topographic surveys and existing drainage, the current minor system consists of a storm sewer network, with primary servicing located within Lakeshore Rd. East, Lakefront Promenade, Rangeview Rd., and Hydro Road. Refer to **Figure 4.1** for the existing drainage and storm servicing. The existing municipal storm sewers around the site are as follows:

1) 300mmØ - 675mmØ and a 450mmØ-750 mmØ storm sewers in parallel at opposite ends of the road along Lakeshore Road East
2) 450mmØ-950mmØ along Hydro Road
3) 975mmØ-1200mmØ along Rangeview Road
4) 450mmØ-1800mmØ along Lakefront Promenade

Based on the topography and previous planning documents, it was determined the subject site ultimately drains to Lake Ontario. Given the proposed developments' proximity to Lake Ontario, quantity control is not required as per City and CVC criteria. However, quantity control and the allowable release rates for the proposed site plans will be restricted based on the 10-year minor flows to storm sewers, as per the City of Mississauga Development Requirements Manual, dated 2020. As per background studies from the Lakeview Village development to the south, an external area of 10.67ha north of the subject site drains into the site area to Lakefront Promenade. The existing external drainage pattern is expected to be maintained in post-development conditions.

Phil Gotfried



RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

LEGEND

SUBJECT AREA

EXISTING STORM SEWER

EXISTING DRAINAGE AREA
AREA = 25.7ha
RUNOFF COEFFICIENT = 0.50

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FIGURE 4.1
PRE-DEVELOPMENT DRAINAGE
& EXISTING STORM SERVICING

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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4.2 Stormwater Management Criteria

Stormwater management criteria for the subject site are to be in accordance with the City of Mississauga, Peel Region, and the Credit Valley Conservation Authority (CVC) design criteria listed below.

Based on the City of Mississauga design criteria:

- Storm sewers shall be designed to convey at least the 10-year return frequency storm without surcharging during any storm return frequency event;
- The minimum pipe diameter for storm sewers is 300mmØ;
- For estimating flows using the Rational Method from storms larger than the 10-year return, the runoff coefficients were increased to account for the increase in runoff due to saturation of the soil as per equations provided in the City of Mississauga design criteria.
- Storm sewers shall be designed using the Rational Method: Q =A*I*R/360, where 'Q' is the flow rate in [m^3/s], 'R' is the runoff coefficient (dimensionless), 'A' is the area in [ha], 'I' is rainfall intensity in mm/hr;

Table 4-1 City of Mississauga IDF Curve

Design Storm Event	A	B	C	I (mm/hr)
2-Year	610.0	4.6	0.78	59.9
5-Year	820.0	4.6	0.78	80.5
10-Year	1010.0	4.6	0.78	99.2
25-Year	1160.0	4.6	0.78	113.9
50-Year	1300.0	4.7	0.78	127.1
100-Year	1450.0	4.9	0.78	140.7

I= A/(B+Tc)^C, where minimum time of concentration as per Mississauga Guidelines is Tc = 15mins

- **Water Quantity**–Site plans to be controlled to the post-development 10-year minor flows;
- **Water Quality**–Level 1 water quality (enhanced) protection (80% TSS removal) is required;
- **Water Balance-**The development is not located in the source protection plan's Q1, Q2 wellhead protection area. There is a lake within the vicinity of the proposed development.

Therefore, there is no requirement for a water balance analysis;

- **Volumetric Controls –** 5mm infiltration, filtration, or evapotranspiration is required.

The following sections describe how the subject site area will satisfy the above-mentioned stormwater management criteria.

4.3 Proposed Stormwater Management Plan

The following sections discuss in detail the proposed stormwater management solutions to be incorporated on-site to meet the applicable stormwater management criteria identified in **Section 4.2.**

The subject site is proposed to ultimately discharge in Lake Ontario as per existing conditions. The proposed SWM scheme considers the ultimate condition and complies with the Lakeview servicing proposed to the south of the subject site. Quantity control, quality control, and volumetric controls are proposed at the site plan level. As per the grading plans, a safe overland flow route is provided within the municipal roadways.

Quality control at the site plan level is proposed to be achieved via Jellyfish filters or equivalent measures. For the municipal right of way, quality control is proposed via a treatment train approach with tree pits in conjunction with OGS units to satisfy the required 80% TSS removal. Further details about quality control are presented in **Section 4.3.4**.

Considering the site's close proximity to the Lake, meeting the pre-development water balance is not a required criterion. However, 5mm retention via filtration or infiltration, or re-use is required for volumetric controls as per the City of Mississauga SWM criteria. Additional details about the 5mm retention on-site are presented in **Section 4.3.5**.

4.3.1 Allowable Release Rates

Allowable release rates were established based on the City of Mississauga's IDF parameters. The Rational method was used to calculate release rates as the total development discharges runoff to storm sewers. The allowable release rates for all site plans were established based on the 10-year storm events using a pre-development runoff coefficient of 0.50, summarized in **Table 4.2**. A minimum time of concentration of 15 minutes was considered as per the City of Mississauga guidelines.

As per background studies from the Lakeview Village development to the south, an external area of 10.67ha north of the subject site drains into the site to Lakefront Promenade. The existing external drainage pattern is expected to be maintained in post-development conditions.

Long-term foundation drainage can be discharged to the storm sewer system provided suitable pre-treatment is provided. The hydrogeological report estimated long-term dewatering rates based on the parcels, it was noted a block-wide detailed hydrogeological investigation is required to be completed to recommend the actual design dewatering requirements. The allowable release rates for the site plans were adjusted to consider an assumed groundwater pump rate of 2 L/s for each site plan (higher than the recommendation from the hydrogeological report). This groundwater pump rate is considered to be a conservative dewatering rate estimate, which can be revisited at the site plan approval stage throughout the SPA process. Therefore, the allowable discharge for the site plans was calculated by reducing the 10-year minor flows by the assumed 2 L/s groundwater pumping rate. The release rate can be adjusted based on the final recommendations of the hydrogeological reports and mechanical engineer on an individual site plan basis throughout the SPA process.

Table 4-2 Allowable Release Rate for Site Plans

Catchment #	Area (ha)	Pre Development Runoff Coefficient	Post Development Runoff Coefficient	Allowable Discharge (10-year minor flows) (L/s)*	Groundwater Dewatering Rate (L/s)	Adjusted Allowable Release Rate (10-year flows – Groundwater pumping) (L/s)**
				A	B	C = A -B
201	0.52	0.50	0.90	71.62	2.00	69.62
202	0.76	0.50	0.90	104.67	2.00	102.67
203	0.39	0.50	0.90	53.71	2.00	51.71
204	0.39	0.50	0.90	53.71	2.00	51.71
205	0.48	0.50	0.90	66.11	2.00	64.11
206	0.54	0.50	0.90	74.37	2.00	72.37
207	0.93	0.50	0.90	128.09	2.00	126.09
208	0.92	0.50	0.90	126.71	2.00	124.71
209	0.58	0.50	0.90	79.88	2.00	77.88
210	0.84	0.50	0.90	115.69	2.00	113.69
211	0.86	0.50	0.90	118.45	2.00	116.45
212	0.20	0.50	0.90	27.55	2.00	25.55
213	0.40	0.50	0.90	55.09	2.00	53.09
214	0.34	0.50	0.90	46.83	2.00	44.83
215	0.86	0.50	0.90	112.94	2.00	110.94
216	0.19	0.50	0.90	26.17	2.00	24.17
217	0.36	0.50	0.90	49.58	2.00	47.58
218	0.58	0.50	0.90	79.88	2.00	77.88
219	0.57	0.50	0.90	78.51	2.00	76.51

Catchment #	Area (ha)	Pre Development Runoff Coefficient	Post Development Runoff Coefficient	Allowable Discharge (10-year minor flows) (L/s)*	Groundwater Dewatering Rate (L/s)	Adjusted Allowable Release Rate (10-year flows – Groundwater pumping) (L/s)**
				A	B	C = A -B
220	1.00	0.50	0.90	137.73	2.00	135.73
221	1.30	0.50	0.90	179.05	2.00	177.05
222	0.74	0.50	0.90	101.92	2.00	99.92
223	0.82	0.50	0.90	112.94	2.00	110.94
224	0.46	0.50	0.90	63.36	2.00	61.36
225	0.38	0.50	0.90	52.34	2.00	50.34
226	0.61	0.50	0.90	84.02	2.00	82.02
227	0.32	0.50	0.90	44.07	2.00	42.07
228	0.35	0.50	0.90	48.21	2.00	46.21

*The allowable Discharge was calculated using a pre-development runoff coefficient of 0.50.
**The adjusted allowable release rate = 10-year minor flows – Groundwater pumping rate

4.3.2 Quantity Control

In order to achieve the release rates, set up in **Section 4.3.1**, quantity control is proposed at the site plan level. Due to the close proximity of Lake Ontario, no quantity control is proposed for the park and municipal right of way. The established release rate for each site plan and the required storage are presented in **Table 4-3** below. The quantity control requirement on the site plan can be met via underground storage combined with an orifice control device.

Table 4-3 Storage Summary

Catchment #	Area (ha)	Post-Development Runoff Coefficient	Adjusted Allowable Discharge (L/s)	Required On-site storage (m^3)
201	0.52	0.90	69.62	121.68
202	0.76	0.90	102.67	176.84
203	0.39	0.90	51.71	91.80
204	0.39	0.90	51.71	91.80
205	0.52	0.90	64.11	112.48
206	0.54	0.90	72.37	126.27
207	0.93	0.90	126.09	215.91
208	0.92	0.90	124.71	213.61
209	0.58	0.90	77.88	135.47
210	0.84	0.90	113.69	195.22
211	0.86	0.90	116.45	199.82
212	0.20	0.90	25.55	48.18
213	0.40	0.90	53.09	94.10
214	0.34	0.90	44.83	80.31

Catchment #	Area (ha)	Post-Development Runoff Coefficient	Adjusted Allowable Discharge (L/s)	Required On-site storage (m^3)
215	0.82	0.90	110.94	190.63
216	0.19	0.90	24.17	45.89
217	0.36	0.90	47.58	84.90
218	0.58	0.90	77.88	135.47
219	0.57	0.90	76.51	133.17
220	1.00	0.90	135.73	232.00
221	1.30	0.90	177.05	300.95
222	0.74	0.90	99.92	172.24
223	0.82	0.90	110.94	190.63
224	0.46	0.90	61.36	107.89
225	0.38	0.90	50.34	89.50
226	0.61	0.90	82.02	142.36
227	0.32	0.90	42.07	75.72
228	0.35	0.90	46.21	82.61

4.3.3 Quality Control

As per the quality control requirements of the City of Mississauga and CVC, the proposed developments require the provision of an enhanced level of quality treatment (i.e., 80% TSS removal) on-site.

In order to achieve an enhanced level of treatment for the site, different strategies have been proposed based on each block's land use. The strategies for each land-use type are described in the following sections below.

4.3.3.1 Private Site Plan Block Treatment

Within the private site plan blocks, treatment can be provided through various options based on the proposed land use. Given the variety of options for treatment within private developments, it is proposed that all site plan blocks provide 80% TSS removal (enhanced level) at the site level.

1. Treatment Train Approach (i.e. Bioswale/Retention/Infiltration Unit + OGS Unit)
2. Centralized Filtration Units (ie: jellyfish or equivalent)

Note that the use of the above-mentioned options should be considered on a per-site plan basis and

should be further explored during each block's specific design. Considerations for each site plan block option are further discussed in this section.

Option 1. Bioswale/Retention/Infiltration Unit + OGS Unit

In option 1, site plans where spatial factors are favourable, flows can be directed to surface-level bioretention facilities (such as bioswales or rain gardens) where an initial treatment layer can be provided. These facilities can be sized to provide a minimum of 60% TSS removal. Flows that have been treated by these facilities can then be directed to an on-site OGS for an additional layer of treatment (50% TSS removal). This approach would provide a treatment train to provide a minimum of 80% TSS prior to flows leaving the site.

Option 2. Centralized Filtration Units

In cases where infiltration-based treatment is not feasible, a centralized proprietary treatment unit can be provided within the private site and sized to provide an enhanced level of treatment (80% TSS removal) to site flows before discharging to the municipal sewers. Any proposed treatment units should be sized as per each block's specific site plan design.

Groundwater Treatment

It was determined from the hydrogeological report groundwater discharge to the storm sewers requires treatment. Treatment options for groundwater discharge include but are not limited to the settlement of suspended solids and specialized filtration. Groundwater treatment for each site plan block can be finalized throughout the SPA process when detailed information from a mechanical engineer and treatment specialists becomes available.

4.3.3.2 Public Park Block Treatment

In general, public park blocks are considered to be made up of predominantly clean vegetated pervious areas. The proposed parks will enhance the area as it is increasing the green space from existing conditions. As a result, it is expected that limited to no treatment will be required to achieve 80% TSS removal. Should some level of treatment be required, LID measures such as vegetated filter strips or swales can be incorporated into the park's design in order to ensure an enhanced level of quality treatment is obtained.

4.3.3.3 Public Right-of-Way Treatment

Within the public right-of-way areas, quality treatment is generally more constrained as a result of paved roadway areas which occupy the majority of the ROW.

Since an enhanced level of quality treatment is required, various options were developed based on the detailed review of the feasible LID measures and groundwater levels on site. These options include:

1. Centralized OGS units and tree pits/tree trenches;
2. Perforated catchbasin lead and OGS;

The final selection of these options will be made based on discussions with the City. These options are discussed in further detail in the following sections.

Option 1 – Tree Pits/Tree Trenches within Boulevards + OGS

The inclusion of infiltration within the City's public right of way allows for both quality treatment and stormwater retention, which assists in reducing the erosion potential and impact on water balance as a result of development.

Based on the review of the preliminary hydrogeological report by DS Consultants Ltd on September 22, 2023, the groundwater levels varied between 1.57 m to 1.64 m under the existing ground elevation and some dry readings; thus, it is anticipated an infiltration-based tree pit wouldn't be feasible; therefore, a filter-based tree pit is proposed.

A typical tree pit filter design will be incorporated within areas with ample boulevard room for planting space and placed along the roadway, upstream of proposed catch basins. In this scheme, flows will first be directed to a tree pit via a curb cut along the road. Once the flows are diverted to the tree pits, they can filter through the proposed engineered soil media (sized to provide a minimum 60% TSS removal based on volumes prescribed by MOE Table 3-2), from where the flows can be collected and diverted to the storm sewer system or be infiltrated.

Based on the MOE Table 3.2, the filter beds need to be sized for 20m^3/ha to achieve 60% TSS removal. A downstream OGS unit will be provided to ensure that a minimum of 50% TSS removal is achieved, providing a total of 80% TSS removal when used in conjunction with tree pits (50% + (1.0 – 0.5) x 60%) = 80%). The sizing of the OGS units will be completed in the detailed design stage.

For ROW areas that are not treated by the OGS, the tree pits are to be sized to provide the entire 80% TSS removal as per MOE Table 3.2.

LIDs along Lakefront Promenade are proposed to satisfy the higher of the 5mm retention for volumetric controls or required TSS removal for quality. See **Appendix D** for details. Refer to the table below Summary of Retention Targets for the Municipal ROW.

Option 2 – Perforated CB lead + OGS

Flows captured by a typical roadside catch basin can be infiltrated via a perforated pipe system. to provide 60% TSS removal. The catch basin lead can be perforated and appropriately sized to enable infiltration with the excess draining directly to the sewer system. Alternatively, an exfiltration pipe can be proposed at the catch basin with excess flow overflowing to the storm sewer system via a CB lead placed strategically at a higher location.

Paired with the perforated CB lead and an OGS sized for 50% TSS removal to complete the treatment train in achieving 80% TSS removal (50% + (1.0 – 0.5) x 60%) = 80%).

4.3.4 Water Balance and Volumetric Controls

The Rangeview Development area was checked as per the Ontario Source Water Protection areas; the site was found to be outside of any source water well-head protection areas. Given the proximity of the site to Lake Ontario, there is no requirement for a water balance analysis. Furthermore, most of the subject site is developed under existing conditions and mainly consists of impervious commercial and industrial areas. Since it is proposed to provide nine park blocks and various landscaped areas within the subject site, it is expected that the development will provide a net reduction in impervious areas and an overall benefit to the water balance.

However, as stipulated in the City of Mississauga, on-site retention via infiltration, filtration, or water re-use of the first 5mm of rainfall should be retained on-site to mitigate water balance and volumetric impacts of development. The sections below discuss strategies to satisfy the volumetric requirements. The table below summarizes the required retention volumes for each portion of the proposed development.

Table 4-4 Summary of Retention Targets

Description	Catchment #	Area (ha)	Runoff Coefficient	Volumetric Requirement (m^3)*
Site Plan	201	0.52	0.90	26.00
Site Plan	202	0.76	0.90	38.00
Site Plan	203	0.39	0.90	19.50
Site Plan	204	0.39	0.90	19.50
Site Plan	205	0.48	0.90	24.00
Site Plan	206	0.54	0.90	27.00
Site Plan	207	0.93	0.90	46.50
Site Plan	208	0.92	0.90	46.00
Site Plan	209	0.58	0.90	29.00
Site Plan	210	0.84	0.90	42.00
Site Plan	211	0.86	0.90	43.00
Site Plan	212	0.20	0.90	10.00
Site Plan	213	0.40	0.90	20.00
Site Plan	214	0.34	0.90	17.00
Site Plan	215	0.82	0.90	41.00
Site Plan	216	0.19	0.90	9.50
Site Plan	217	0.36	0.90	18.00
Site Plan	218	0.58	0.90	29.00
Site Plan	219	0.57	0.90	28.50
Site Plan	220	1.00	0.90	50.00
Site Plan	221	1.30	0.90	65.00
Site Plan	222	0.74	0.90	37.00
Site Plan	223	0.82	0.90	41.00
Site Plan	224	0.46	0.90	23.00
Site Plan	225	0.38	0.90	19.00
Site Plan	226	0.61	0.90	30.50
Site Plan	227	0.32	0.90	16.00

Description	Catchment #	Area (ha)	Runoff Coefficient	Volumetric Requirement (m^3)*
Site Plan	228	0.35	0.90	17.50
Municipal ROW	401	0.20	0.90	10.00
Municipal ROW	402	0.19	0.90	9.50
Municipal ROW	403	0.18	0.90	9.00
Municipal ROW	404	0.71	0.90	35.50
Municipal ROW	405	0.82	0.90	41.00
Municipal ROW	406	0.23	0.90	11.50
Municipal ROW	407	0.27	0.90	13.50
Municipal ROW	408	0.29	0.90	14.50
Municipal ROW	409	0.52	0.90	26.00
Municipal ROW	410	0.61	0.90	30.50
Municipal ROW	411	0.18	0.90	9.00
Municipal ROW	412	0.16	0.90	8.00
Municipal ROW	413	0.32	0.90	16.00
Municipal ROW	414	0.44	0.90	22.00
Municipal ROW	415	0.50	0.90	25.00
Municipal ROW	416	0.21	0.90	10.50
Municipal ROW	417	0.21	0.90	10.50
Municipal ROW	418	0.34	0.90	17.00
Municipal ROW	419	0.15	0.90	7.50

*Volumetric Requirement= TIMP x 5mm x Area x 10

4.3.4.1 Private Site Plan Block Retention

Runoff can be infiltrated via infiltration-based LIDs or reused within private site plans via rainwater harvesting tanks. Site reuse can include a combination of irrigation, greywater, mechanical cooling, or infiltration where possible. The specific site uses and retention designs should be confirmed per each private site plan block's specific servicing design. Infiltration-based LIDs should be supported by site-specific groundwater conditions.

4.3.4.2 Public Park Block Retention

Due to the nature of the park design, with the increased landscape and reduced level of imperviousness from existing conditions, it is not proposed to provide any retention on the park blocks.

4.3.4.3 Public Right of Way Retention

In order to achieve the required retention volume presented in **Table 4.4** the use of infiltration or filtration-based techniques within the public boulevard is required.

LIDs to be used along the public right of way can include tree pits (as described in Section 5.3.2) which can be sized to retain the greater of 5mm retention volumes or quality control. However, considering the site consists of high groundwater levels, the use of infiltration LIDs may be challenging. In scenarios where groundwater constraints present infiltration concerns, the tree pits can be designed for filtration.

4.3.5 Interim Conditions

Under the interim scenario, infrastructure cannot be built along the entirety of Street 'L' due to the presence of non-participating landowners. The configuration of storm servicing for the ultimate (full buildout) scenario is based on the interim condition of current participating lands. Thus, as shown in **Figure 4.3**, there are three (3) proposed cul-du sacs on Street L based on the current participating lands. The proposed SWM scheme considers the interim phase and ensures no impediment to the drainage flow from the existing developments. The interim condition is subject to meeting the applicable stormwater management criteria identified in **Section 4.2**.

It is to be noted that during the interim phase to support servicing for the development, a 6m wide easement is proposed through the park block catchment 303. This easement is to be decommissioned in ultimate conditions.

Logan Yule

EXTERNAL AREA
10.67ha

GREAVES AVE.
EAST AVE.
WESTMOUNT AVE.
ALEXANDRA AVE.
MEREDITH AVE.
EAGLEIGH AVE.
OGDEN AVE.
STRATHY AVE.
LAKESHORE RD. EAST
LAKESHORE RD. EAST
LAKESHORE RD. EAST
EAST AVE.
FRONTENAC CIR.
OGDEN RD.
RANGEVIEW RD.
RANGEVIEW RD.

| | | |

Logan Yule



RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

LEGEND

- SUBJECT AREA
- PROPOSED STORM SEWER
- PROPOSED OGS
- * STORM SEWER SHOWN ON OGDEN RD. AND STREET 'G', SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.

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FIGURE 4.3
INTERIM
STORM SERVICES

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

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Logan Yule

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

LEGEND

- SUBJECT AREA
- PROPOSED STORM SEWER
- PROPOSED OGS
- * STORM SEWER SHOWN ON OGDEN RD. AND STREET 'G', SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.

LAKESHORE RD. EAST
LAKESHORE RD. E (WIDENING)
GREAVES AVE.
EAST AVE.
WATERMOUNT AVE.
ALEXANDRA AVE.
MEREDITH AVE.
EAGLEIGH AVE.
OGDEN AVE.
STRATHY AVE.
RANGEVIEW RD.
LAKEFRONT PROMENADE
STREET 'L'
STREET 'G'
PARK BLOCK
Ex. LAKEVIEW WATER TREATMENT PLANT
Ex. DOUGLAS KENNEDY PARK
Ex. LAKEVIEW PARK

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FIGURE 4.4
ULTIMATE
STORM SERVICES

2020-4938	SEPTEMBER 2023	SCALE: N.T.S.

W:\4900's\4938 - Rangeview, Mississauga\Drawings\Servicing\2023-09-22-4938-Proposed Servicing Ultimate.dwg

5 CLOSING REMARKS

This report illustrates the comprehensive servicing strategy for the Rangeview study area. The proposed municipal servicing strategy has been proposed to satisfy the City of Mississauga and CVC guidelines, and this strategy will be used by future developments for their respective detailed servicing designs. The key servicing components are summarized below.

Water Supply Servicing

- The subject site is proposed to be serviced by connecting to existing watermains along Lakeshore Road East, Rangeview Road, and East Avenue, as well as 400 mm diameter watermains along Lakefront Promenade and Hydro Road, proposed as part of the Lakefront Community development;
- A 300 mm diameter watermain is proposed along Street 'L', extending from East Avenue to Hydro Road;
- A 300 mm diameter watermain is proposed along Ogden Avenue, connecting to the existing 600 mm diameter watermain along Lakeshore Road East and the existing 250 mm diameter watermain along Rangeview Road;
- Two interim conditions have been proposed depending on the agreements with the nonparticipating landowners.

Sanitary Servicing

- The subject site will be serviced as per the details outlined in the Interim and Ultimate Servicing Plan.
- A downstream sanitary capacity analysis has been completed to analyze the sewers during the Ultimate Servicing Plan. As discussed in **Section 3.5**, upgrades will be required for the existing sewers along Rangeview Road and a pipe size has been provided for the new sub trunk sewer along East Avenue.

Storm Servicing

- Quantity control is proposed at a site plan level. Quantity controls for proposed site plan developments will include the capture and control of peak flows from storm events up to and including the 100-year storm to the 10-year sewer capacity.

- Quality controls will be provided within each site plan block to meet the enhanced level of treatment. For the public right of way, various options were reviewed to provide an enhanced level of treatment. Currently, it is proposed to implement a tree pit filtration/infiltration strategy with an end-of-pipe OGS to achieve an enhanced level of treatment.
- The retention of 5mm on-site can be achieved in each block through the use of infiltration or re-use systems within site plans, while the ROW can make use of infiltration/filtration via roadside tree pits.

We trust that you will find this material satisfactory, and we are looking forward to receiving your comments soon. Should you have any questions or comments, please do not hesitate to contact us.

Respectfully Submitted,

SCHAEFFER & ASSOCIATES LTD.



Ishraque Chandan, EIT.
Water Resource Analyst

Heather Milukow, M.Eng., P.Eng.
MESP and Site Plan Group Manager

s

Appendix A
Background Information

MASTER PLAN V6.2

Concept Plan



Legend Rangeview Estates Precinct Area — — Existing Parcel Lines

Preliminary Hydrogeological Investigation
Proposed Residential and Commercial Buildings
Rangeview Estates Precinct Development
Mississauga, Ontario

PREPARED FOR:
Rangeview Landowners Group Inc.

Project #: 22-200-100
Date: September 22, 2023

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22-200-100 September 22, 2023

Rangeview Estates Precinct Development
C/O Rangeview Landowners Group Inc.
Rangeview Road
Mississauga, ON

RE: Preliminary Hydrogeological Investigation-Rangeview Estates Precinct Development, Rangeview Road and Surrounding Area, Mississauga, ON

DS Consultants Limited (DS) was retained by Rangeview Landowners Group Inc. to complete a preliminary hydrogeological investigation of the proposed development on Rangeview Road and the surrounding area in Mississauga, Ontario (Site). The site is located nearby about 3.5 kilometers east of Port Credit. The site is currently occupied by commercial and industrial buildings. Based on the conceptual plan, the site will be developed with low to mid-rise residential and commercial buildings with 1 to 3 levels of underground parking/basement. Also, it is DS's understanding installation of local site servicing will be part of the larger development. The report includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area and provides a preliminary assessment of the hydrogeological constraints and impacts of the proposed development on the local groundwater.

Based on the results of our investigation, the following summary of conclusions and recommendations are presented:

1. Based on the MECP water wells records search, there are 244 water wells registered within 500 meters of the Site. One (1) water well is noted as a water supply for industrial use. All other well records as registered as test hole, monitoring well, not in use, dewatering well or unknown. DS conducted a door-to-door survey to confirm the water supply well. No wells were confirmed to have existed during the survey. The study area is fully serviced with municipal water and therefore, no groundwater users are expected in the area.

2. In total, 22 boreholes were drilled across the site by DS Consultants Ltd. (DS) as part of the preliminary hydrogeological investigation concurrently with the geotechnical investigation in August 2022. All boreholes were advanced to depths ranging from 2.5 to 8.2 meters below the ground surface (mbgs). A total of nine (9) drilled boreholes were converted into monitoring wells and screened in overburden and shale bedrock at depths ranging from 3.0 to 8.2 mbgs.

3. The study area (500 m radius) lies within the Iroquois Plain physiographic region of southern Ontario and is characterized by the Bevelled Till Plains physiographic landform. The surficial geology in the study area is dominated by clayey silt till deposits and coarse-textured glaciolacustrine deposits of sand, gravel, silt, and clay. The soils at the Site consist of asphalt and heterogeneous fill materials, followed by clayey silt till/ silty clay with interbedded sandy silt/silty sand seam and shale bedrock of the Georgian Bay Formation. Bedrock depth varies from about 2.2 m to 6.1 meters below the existing ground surface at the Site.

4. DS measured the groundwater levels in all wells on September 20, 2022. Groundwater levels in overburden monitoring wells were found between 1.57 mbgs and 1.64 mbgs and in bedrock wells at 2.29 mbgs. The groundwater levels at the Site can be subject to seasonal fluctuations. Groundwater flow direction is expected to be south towards Lake Ontario.

5. Single well response tests (SWRTs) were completed at three (3) monitoring wells with sufficient water to estimate hydraulic conductivity (k) for the representative geological units in which the wells are completed. The reported hydraulic conductivity values (k) for overburden range between 5.3 X 10^{-6} and 1.1 × 10^{-7} m/s and weathered shale/ shale bedrock is 2.5 X10^{-6} m/s.

6. Construction Dewatering: Short-term and Long-term Discharge

   - DS understands that the proposed development concept will have up to three (3) levels of underground parking (P3). It is estimated that a conventional pile/lag shoring system will be used up to weathered shale bedrock and the excavation within the shale bedrock will be open cut (unsealed) for the proposed underground construction.

   - Based on the k-values of soils or rock for the site and surrounding areas, the dewatering flow rates within the assumed excavation area are expected to be low to medium. However, flow rates can be affected by any recharge from near Lake Ontario. Also, a secondary permeability of bedrock can contribute higher flow rate.

   - It is DS's understanding that a parcel/block-wise detailed hydrogeological investigation will be carried out in the future as per the actual design to estimate dewatering requirements. The preliminary estimated short-term and long-term discharge rates are presented in the table below.

Parcel	Area m^2	UG Level	Short-term Discharge				Long-term Discharge	
			Flow Rate(Q) without a Safety factor L/day	Flow Rate with a Safety factor x 1.5 L/day	Stormwater (10 mm/24 hrs.) L/day	Total Flow Rate L/day	Flow Rate(Q) without a Safety factor L/day	Flow Rate with a Safety factor x 1.5 L/day
Parcel 1	5,200	3	30,000	45,000	52,000	97,000	23,000	34,500
Parcel 2	7,700	2	23,000	34,500	77,000	111,500	16,000	24,000
Parcel 3	3,800	3	27,000	40,500	38,000	78,500	20,000	30,000
Parcel 4	3,800	3	27,000	40,500	38,000	78,500	20,000	30,000
Parcel 5	4,700	3	29,000	43,500	47,000	90,500	22,000	33,000
Parcel 6	5,400	3	31,000	46,500	54,000	100,500	23,000	34,500
Parcel 7	9,300	2	25,000	37,500	93,000	130,500	17,000	25,500
Parcel 8-9	9,200	2	25,000	37,500	92,000	129,500	17,000	25,500

Parcel	Area m^2	UG Level	Short-term Discharge				Long-term Discharge	
			Flow Rate(Q) without a Safety factor L/day	Flow Rate with a Safety factor x 1.5 L/day	Stormwater (10 mm/24 hrs.) L/day	Total Flow Rate L/day	Flow Rate(Q) without a Safety factor L/day	Flow Rate with a Safety factor x 1.5 L/day
Parcel 10	5,900	3	32,000	48,000	59,000	107,000	24,000	36,000
Parcel 11	8,300	2	24,000	36,000	83,000	119,000	16,000	24,000
Parcel 12	8,600	2	25,000	37,500	86,000	123,500	16,000	24,000
Parcel 13	2,000	-	-	-	-	-	-	-
Parcel 14	4,000	1	9,000	13,500	40,000	53,500	4,000	6,000
Parcel 15	3,800	3	27,000	40,500	38,000	78,500	20,000	30,000
Parcels 16-17	8,200	2	24,000	36,000	82,000	118,000	16,000	24,000
Parcel 18	1,800	-	-	-	-	-	-	-
Parcel 19	3,600	3	26,000	39,000	36,000	75,000	20,000	30,000
Parcels 20-21	5,800	2	21,000	31,500	58,000	89,500	14,000	21,000
Parcel 22	5,700	2	20,000	30,000	57,000	87,000	14,000	21,000
Parcel 23	10,000	1	13,000	19,500	100,000	119,500	6,000	9,000
Parcel 24	12,900	2	30,000	45,000	129,000	174,000	20,000	30,000
Parcel 25	7,400	3	35,000	52,500	74,000	126,500	27,000	40,500
Parcels 26-27	8,300	2	24,000	36,000	83,000	119,000	16,000	24,000
Parcels 27-28	4,600	2	19,000	28,500	46,000	74,500	12,000	18,000
Parcels 29-30	3,700	3	27,000	40,500	37,000	77,500	20,000	30,000
Parcel 31	6,000	2	21,000	31,500	60,000	91,500	14,000	21,000
Parcel 32	3,300	1	8,000	12,000	33,000	45,000	3,000	4,500
Parcel 33	3,400	3	26,000	39,000	34,000	73,000	19,000	28,500

7. Construction Dewatering: Public ROW (Site Servicing):

- An assumed 100 m long and 2 m wide open cut section was considered for dewatering estimation during the installation of underground utilities such as water main, storm and sanitary sewer and utility access holes. Based on the site servicing drawings provided to DS, the proposed bottom of underground utilities varies between 5-6 mbgs. The highest shallow groundwater level for the site is 84 masl.

- The estimated dewatering rate (short-term) during the installation of underground utilities for the trench (30 m x 2 m) is 14,000 L/day without a safety factor and 21,000 L/day with a safety factor of x1.5. The additional flow rate that may be needed to be removed because of precipitation events (assuming 10 mm/24 hours) would be an additional 1,000 L/day.

The dewatering volume for the section can be change depending on the existing grade and the actual groundwater level encountered during the excavation of the section.

8. Permits Requirements:

In the absence of drawings/site plans and construction sequencing details, DS anticipates that the construction of the proposed construction will be phased. Therefore, permit requirements can be determined once the final design, revised dewatering rates, and construction sequences are available. Below are the regulatory dewatering permit requirements regarding estimated daily discharge volume.

- An EASR or a PTTW is not required for water taking less than 50,000 L/day.
- An Environmental Activity Sector Registration (EASR) is required to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if the taking of groundwater and stormwater for a temporary construction project is between 50,000 L/day and 400,000 L/ day. The EASR application is an online registry and should be submitted to the MECP before any construction dewatering.
- A PTTW is required to be submitted to the MECP if the taking of groundwater and stormwater for a temporary construction project is more than 400,000 L/ day. The PTTW application is also an online registry and should be submitted to the MECP 90 days from the start of construction.
- A discharge permit may be required from the City of Mississauga if groundwater is to be sent to the sewer system for short-term (during construction)

9. One (1) unfiltered groundwater sample was collected from the monitoring well BH 22-9 on September 22, 2022, and another water sample was collected from monitoring well BH 22-14 between April 17 and May 3, 2023. The groundwater samples were analyzed and compared against the parameters listed in the Region of Peel Wastewater Bylaw (53-2010) and the City of Mississauga Storm Sewer Use Bylaw.

10. Groundwater quality analysis indicates that TSS, various total metals and cis- 1,2-Dichloroethene exceeded the sanitary or storm criteria under the Region of Peel's Wastewater Bylaw (53-2010) and the City's Sewer Use Bylaw. Therefore, groundwater at the Site is not suitable for direct discharge to the Region's or the City's sewer system without pre-treatment. Treatment options include but are not limited to the settlement of suspended solids and specialized filtration to remove fines and associated metals.

11. The area is fully serviced by a municipal water supply. It is not expected to have any use of groundwater as a source of drinking water within a radius of 500 meters therefore, there will be no short-term impacts on private water wells occurring from dewatering activities.

12. Baseline groundwater quality has been assessed and established before construction. However, groundwater quality can change based on several factors (land-use change, spills, natural

variations, site remediation activities, etc.) and should be monitored during construction dewatering and after construction to ensure that water quality meets the guideline or regulations associated with any permits from the MECP and the City/Region.

13. In conformance with Regulation 903 of the Ontario Water Resources Act, the decommissioning of any dewatering system and monitoring wells should be conducted by a licensed contractor under the supervision of a licensed water well technician.

Should you have any questions regarding these findings, please contact the undersigned.

DS Consultants Ltd.

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FIGURES

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FIGURE 2 Surficial Geology Map

FIGURE 3 Borehole and Monitoring Well Locations

Figure 4A Geological Cross Section (A-A')

Figure 4B Geological Cross Section (B-B')

APPENDICES:

Appendix A Borehole Logs

Appendix B MECP Water Wells Records

Appendix C Hydraulic Conductivity Analysis

Appendix D Groundwater Quality Certificate of Analysis

Appendix E Conceptual Development Plan

1.0 INTRODUCTION

DS Consultants Limited (DS) was retained by Rangeview Landowners Group Inc. to complete a preliminary hydrogeological investigation of the proposed development on Rangeview Road and the surrounding area in Mississauga, Ontario (Site). The site is located nearby about 3.5 kilometers east of Port Credit. The site is currently occupied by commercial and industrial buildings. Based on the conceptual plan, the site will be developed with low to mid-rise residential and commercial buildings with 1 to 3 levels of underground parking/basement. Also, it is DS's understanding that the installation of local site servicing will be part of the overall development.

The report includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area and provides an assessment of the hydrogeological constraints and impacts of the proposed development on the local groundwater. The preliminary hydrogeological investigation is based on boreholes and monitoring wells drilled and installed by DS on the Site concurrently with the geotechnical investigations.

1.1 Purpose

The purpose of this investigation was to review and determine the need for dewatering, estimate dewatering rates, assess groundwater quality, and determine the need for a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the Ministry of Environment and Climate Change (MECP) in addition to requirements to obtain discharge permits from the Region of the Peel Region/the City of Mississauga. Potential impacts related to construction dewatering and associated monitoring/mitigation measures were also to be investigated.

1.2 Scope of Work

The scope of work for this investigation included:

(i) Site visits;

(ii) Collecting and interpreting available reports and data including the MECP Water Well Records (WWR), geotechnical, hydrogeological and environmental studies completed at the site and in the site's vicinity;

(iii) In-situ hydraulic conductivity testing of newly installed monitoring wells;

(iv) Assessing groundwater quantity and quality to evaluate discharge options;

(v) Assessing potential impacts due to dewatering activities; and,

(vi) Data analyses and report preparation.

2.0 FIELD INVESTIGATION

- In total, 22 boreholes were drilled across the site by DS Consultants Ltd. (DS) as part of the preliminary hydrogeological investigation concurrently with the geotechnical investigation in August 2022. All boreholes were advanced to depths ranging from 2.5 to 8.2 meters below the ground surface (mbgs).

- A total of nine (9) drilled boreholes were converted into monitoring wells and screened in overburden and shale bedrock at depths ranging from 3.0 to 8.2 mbgs. All monitoring wells were developed before any use to allow for groundwater level monitoring, hydraulic conductivity testing, and to assess groundwater quality.

- A total of nine (9) single well response tests (SWRTs) were completed into wells by performing a rising head test to estimate hydraulic conductivity values of formations/soils at the Site.

- Two unfiltered groundwater samples were collected and analyzed for the parameters listed under the Region of Peel and City of Mississauga Sewer Use By-law to assess groundwater quality before any discharge to the City's sewers system.

3.0 PHYSICAL SETTING

Available topographic maps and environmental, geotechnical, and hydrogeological reports were used to develop an understanding of the physical setting of the study area. The borehole logs from all investigations at the Site, as well as the Ministry of the Environment, Conservation and Parks Water Wells Records (MECP WWRs), were used to interpret the geological and hydrogeological conditions at the Site.

3.1 Physiography and Drainage

The general topography at the study area and the Site has a gentle slope south towards Lake Ontario, with elevations decreasing from 85 m to 77 m. Drainage at the site is follow the local topography controlled by artificial channels and underground utilities such as sewers. The nearest surface water body Lake Ontario is located at the southern boundary of the Site.

3.2 Geology

The following presents a brief description of regional and Site geological and hydrogeological conditions based on the review of available information and site-specific investigations.

3.2.1 Quaternary Geology

The study area (500 m radius) lies within the Iroquois Plain physiographic region of southern Ontario and is characterized by the Bevelled Till Plains physiographic landform. The surficial geology in the study area is

dominated by clayey to silt textured till (Halton till) and fined-textured glaciolacustrine deposits of silt, clay and minor sand and gravel. The surficial geology map is shown in **Figure 2.**

3.2.2 Bedrock Geology

Available published mapping shows that bedrock in the area is predominantly shales and limestones of the Georgian Bay Formation (MNDM Map 2544 Bedrock Geology of Ontario). Based on the review of local boreholes and well record information, the depth to bedrock in the study area is estimated to be at an elevation of 70 to 80 masl.

3.2.3 Site Geology/Subsurface Soils

Subsurface soils/Site geology on the site was interpreted from the existing boreholes/monitoring wells (BHs/MWs) drilled by DS. The locations of the BHs/MWs are shown in **Figure 3** and detailed subsurface conditions are presented on the borehole Logs in **Appendix A**. The subsurface conditions in the boreholes are summarized in the following paragraphs.

Fill Materials:

Fill material was found in all boreholes extending to depths ranging from 0.8 to 2.5 m below the ground surface. The fill material was heterogeneous and consisted of sandy silt and clayey silt to silty clay, with inclusions of topsoil/organics in varying proportions and trace limestone & shale fragments.

Clayey Silt to Silty Clay Till/ Clayey Silt to Silty Clay:

Below the fill materials, silty clay to clay silt till and interbedded clayey silt to silty clay deposits were encountered in all boreholes at varying depths and extended to the depth of 2.2- 8.2 mbgs.

Shale Bedrock:

Weathered shale/Shale bedrock belonging to Georgian Bay Formation was found at approximate depths varying from 2.2 to 6.1 m below the existing surface.

3.3 Hydrogeology

The hydrogeology at the Site was evaluated using the on-Site monitoring wells installed by DS as part of geotechnical, environmental, and hydrogeological investigations, local domestic wells, and existing hydrogeological reports for the area.

3.3.1 Hydrostratigraphy

The review of sub-surface soils indicates that there are three (3) major hydrostratigraphic units in the vicinity of the site: Glacial Till (Halton till), glaciolacustrine deposits and Shale bedrock of Georgian Bay Formation. These three (3) units are further described below.

- Glacial till is clayey to silty, textured till and known to be interbedded with minor sand deposits. This unit is considered as low permeable or an aquitard.

- The shale bedrock of the Georgian Bay Formation is not considered to be an aquifer and has limited groundwater movement. The upper weathered/fractured shale can have some local groundwater movement.

3.3.2 Local Groundwater Use

As part of the hydrogeological study, DS completed a search of the Ministry of the Environment, Conservation and Parks (MECP) Water Wells Records (WWRs) database. Based on the MECP water wells records search, there are 244 water wells registered within 500 meters of the Site (**Appendix B**). One (1) water well is noted as a water supply for industrial use. All other well records as registered as test hole, monitoring well, not in use, dewatering well or unknown. **Figure 1** shows the MECP water well location plan.

3.3.3 Groundwater Conditions

DS measured the groundwater level in all wells on September 15, 2022. Groundwater levels in overburden monitoring wells were found between 1.57 mbgs and 1.64 mbgs and in bedrock well at 2.29 mbgs. A summary of the measured groundwater levels in all monitoring wells is provided in **Table 3-1.**

Table 3-1: Groundwater Levels in Monitoring Wells

Well ID	Ground Elevation (masl)	Well Depth (mbgs)	Screened Interval (mbgs)	Screened Formation	Depth to Water (mbgs)	Groundwater Elevation (masl)
BH 22-3	81.80	3.1	1.5-3.1	Silty Clay to Clayey Silt till	Dry	-
BH 22-6	83.00	3.0	1.5-3.0	Silty Clay to Clayey Silt till	1.63	81.4
BH 22-9	85.80	6.0	3.0-6.0	Shale	2.29	83.5
BH 22-12	81.60	7.7	4.7-7.7	Silty Clay to Clayey Silt till	Dry	-
BH 22-13	85.40	3.7	2.5-3.7	Clay silty to Sandy Silt/Silty	1.57	83.8
BH 22-14	83.90	6.1	3.1-6.1	Silty Clay to Clayey Silt till	Dry	-
BH 22-17	85.50	3.0	1.5-3.0	Silty Clay to Clayey Silt till	1.64	83.9
BH 22-22	84.30	6.1	3.1-6.1	Silty Clay to Clayey Silt till	Dry	-

3.3.4 Hydraulic Conductivity

A single well response test (SWRT) was completed at three monitoring wells with sufficient water to estimate hydraulic conductivity (k) for the representative geological units in which the wells are completed. The reported hydraulic conductivity values (k) for overburden range between 5.3 X 10^{-6} and 1.1 × 10^{-7} m/s and weathered shale/ shale bedrock is 2.5 X10^{-6} m/s. The test results are summarised in Table 3-2 and the hydraulic testing analysis is provided in **Appendix C.**

Table 3-2: Hydraulic Conductivity (k) Test Results

Well ID	Screen Interval	Screened Formation	K- Value(m/s)
BH 22-6	1.5-3.0	Silty Clay to Clayey Silt till	5.3×10^{-9}
BH 22-9	9.2-12.2	Shale	2.5×10^{-6}
BH 22-13	9.2-12.2	Clay silty to Sandy Silt/Silty Sand(Till)	1.1×10^{-7}

3.3.5 Groundwater Quality

One unfiltered groundwater sample was collected from monitoring well BH 22-9 on September 22, 2022, and from monitoring well BH 22-14 between April 17 and May 3, 2023. The groundwater samples were analyzed and compared against the parameters listed in the Region of Peel Wastewater Bylaw (53-2010) and the City of Mississauga Storm Sewer Use Bylaw.

Groundwater quality analysis indicates that TSS, various total metals and cis- 1,2-Dichloroethene exceeded the sanitary or storm criteria under the Region of Peel's Wastewater Bylaw (53-2010) and the City's Sewer Use Bylaw. The selected certificates of analysis are provided in **Appendix D.**

Table 3-4: Parameters in Groundwater Exceeding the Sewer Use By-law

Parameter Exceeded	Unit	Peel Sanitary Sewer Use Criteria	Mississauga Storm Sewer Use Criteria	BH/MW 22-9 Concentration	BH/MW 22-14 Concentration
Total Suspended Solids	mg/L	350	15	**9560**	**42**
Aluminum	mg/L	50	1	**63.5**	0.1
Arsenic	mg/L	1	0.02	**0.038**	<0.01
Chromium	mg/L	5	0.08	**0.117**	<0.01
Copper	mg/L	3	0.04	**0.129**	<0.01
Manganese	mg/L	5	2	**5.44**	0.018
Nickel	mg/L	3	0.08	**0.135**	<0.005
Phosphorus	mg/L	10	0.4	**3.76**	<0.05
Zinc	mg/L	3	0.2	**0.37**	<0.005
cis-1,2-Dichloroethene	mg/L	4	-	**0.0115**	-

Note: **Bold** – Exceeded Peel Storm Sewer Use, * Exceeded Mississauga Storm Sewer Use, Underline- Exceeded Peel Sanitary Sewer Use

4.0 CONSTRUCTION DEWATERING

DS understands that the proposed development concept **(Appendix E)** will have up to three (3) levels of underground parking (P3). It is estimated that a conventional pile/lag shoring system will be used up to weathered shale bedrock and the excavation within the shale bedrock will be open cut (unsealed) for the proposed underground construction. Based on the k-values of soils or rock for the site and

surrounding areas, the dewatering flow rates within the assumed excavation area are expected to be low to medium. However, flow rates can be affected by any recharge from near Lake Ontario. Also, a secondary permeability of bedrock can contribute higher flow rate. It is DS's understanding that a parcel/block-wise detailed hydrogeological investigation will be carried out as per the actual design to estimate dewatering requirements.

4.1 Short-term Dewatering Requirements- Buildings

No detailed design drawings were available at the time of drafting this report. Following parameters are assumed for the preliminary dewatering assessment for the proposed buildings.

a. Underground Structure: One (1) – Three (3) Levels
b. Assumed Established Ground Elevation: 83.5 masl
c. Assumed Lowest Finished Floor Level (P1-P3): 3-9 m below the established grade
d. Considered Deepest Excavation (including foundation): 5- 11 m below the established grade
e. Considered Average Groundwater Elevation: 82 masl
f. Considered Geomean K- value: 5 x 10^{-7} m/s

The estimated dewatering volumes(Q) using steady-state equations are presented in **Table 4.1**.

$$Q = (pi * K (H^2 – h^2)) / ln (R/r_e)$$

Where,

K – Hydraulic conductivity

H – Distance from static water level to the bottom of an aquifer

h – Depth of water in the well while pumping

r_e – equivalent radius [m] = $((a*b) / \pi)^{0.5}$ where a and b are excavation dimensions

R – Radius of the cone of depression = $r_e + 3000 * (H – h) * K^{0.5}$

Table: 4-1 Estimation of Flow Rate (Short-term Discharge)

Parcel	Area m^2	Under-ground level No.	H (m)	Flow Rate(Q) without a Safety factor L/day	Flow Rate with a Safety factor x 1.5 L/day	Stormwater (10 mm/24 hrs.) L/day	Total Flow Rate L/day
Parcel 1	5,200	3	9.5	30,000	45,000	52,000	97,000
Parcel 2	7,700	2	6.5	23,000	34,500	77,000	111,500
Parcel 3	3,800	3	9.5	27,000	40,500	38,000	78,500
Parcel 4	3,800	3	9.5	27,000	40,500	38,000	78,500
Parcel 5	4,700	3	9.5	29,000	43,500	47,000	90,500
Parcel 6	5,400	3	9.5	31,000	46,500	54,000	100,500

Parcel	Area m^2	Under-ground level No.	H (m)	Flow Rate(Q) without a Safety factor L/day	Flow Rate with a Safety factor x 1.5 L/day	Stormwater (10 mm/24 hrs.) L/day	Total Flow Rate L/day
Parcel 7	9,300	2	6.5	25,000	37,500	93,000	130,500
Parcels 8-9	9,200	2	6.5	25,000	37,500	92,000	129,500
Parcel 10	5,900	3	9.5	32,000	48,000	59,000	107,000
Parcel 11	8,300	2	6.5	24,000	36,000	83,000	119,000
Parcel 12	8,600	2	6.5	25,000	37,500	86,000	123,500
Parcel 13	2,000	-	-	-	-	-	-
Parcel 14	4,000	1	3.5	9,000	13,500	40,000	53,500
Parcel 15	3,800	3	9.5	27,000	40,500	38,000	78,500
Parcels 16-17	8,200	2	6.5	24,000	36,000	82,000	118,000
Parcel 18	1,800	-	-	-	-	-	-
Parcel 19	3,600	3	9.5	26,000	39,000	36,000	75,000
Parcels 20-21	5,800	2	6.5	21,000	31,500	58,000	89,500
Parcel 22	5,700	2	6.5	20,000	30,000	57,000	87,000
Parcel 23	10,000	1	3.5	13,000	19,500	100,000	119,500
Parcel 24	12,900	2	6.5	30,000	45,000	129,000	174,000
Parcel 25	7,400	3	9.5	35,000	52,500	74,000	126,500
Parcels 26-27	8,300	2	6.5	24,000	36,000	83,000	119,000
Parcels 27-28	4,600	2	6.5	19,000	28,500	46,000	74,500
Parcels 29-30	3,700	3	9.5	27,000	40,500	37,000	77,500
Parcel 31	6,000	2	6.5	21,000	31,500	60,000	91,500
Parcel 32	3,300	1	3.5	8,000	12,000	33,000	45,000
Parcel 33	3,400	3	9.5	26,000	39,000	34,000	73,000

The estimated dewatering rate(short-term) for a parcel range between 8,000 L/day and 35,000 L/day without a safety factor and 12,000 L/day and 52,500 L/day with a safety factor of x1.5. Additional water that may be needed to be removed because of precipitation events (assuming 10 mm/24 hours) would be between 33,000 and 129,000 L/day. The dewatering volume for the section can be changed depending on the existing grade, hydraulic conductivity of soils or rock and the actual groundwater level encountered during the excavation of a parcel.

4.2 Short-term Dewatering Requirements- Public ROW (Site Servicing)

No design drawings were available at the time of drafting this report. For the dewatering purpose, a theoretical 30 m long and 2 m wide and 5-6 m deep open cut trench was considered at any given time during the installation of underground utilities such as water main, storm and sanitary sewer and utility access holes as part of the Public ROW. Based on the existing ground levels at the site, the assumed

bottom of underground utilities is about 5-6 mbgs. The groundwater level for the site is between 1.57 and 2.29 mbgs. The requirements of dewatering for the sections will depend on the existing grade and the actual groundwater level encountered during the excavation of sections. The estimated dewatering volume for the assumed trench/section is as below.

$Q = (pi * K (H^2 – h^2)) / ln (R/r_e)$ = 6,000 L/day without a safety factor

Where,

K – Hydraulic conductivity= 2.5 x 10^{-6} m/s (highest k-value)

H – Distance from static water level to the bottom of an aquifer= 4.5

h – Depth of water in the well while pumping-0.0

r_e – equivalent radius [m] = $((a*b) / \pi)^{0.5}$ where a and b are excavation dimensions=

R – Radius of the cone of depression = $r_e + 3000 * (H – h) * K^{0.5}$

The estimated dewatering rate(short-term) during the installation of underground utilities for the assumed trench (30 m x 2 m) is 14,000 L/day without a safety factor and 21,000 L/day with a safety factor of x1.5. The additional flow rate that may be needed to be removed because of precipitation events (assuming 10 mm/24 hours) would be 1,000 L/day. The dewatering volume for a parcel can be changed depending on the existing grade and the actual groundwater level encountered during the excavation of a parcel.

4.3 Long-term Dewatering Requirements- Buildings

Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and drainage along the foundation wall. The estimated long-term drainage flow rate for a parcel with P1-P3 levels using a steady-state flow equation is summarised in **Table 4-2.**

Table 4-2: Estimation of Flow Rate (Long-term Discharge)

Parcel	Area m^2	Under-ground level- No.	H (m)	Flow Rate without a Safety Factor L/day	Flow Rate with a Safety factor x 1.5 L/day
Parcel 1	5,200	3	7.5	23,000	34,500
Parcel 2	7,700	2	4.5	16,000	24,000
Parcel 3	3,800	3	7.5	20,000	30,000
Parcel 4	3,800	3	7.5	20,000	30,000
Parcel 5	4,700	3	7.5	22,000	33,000
Parcel 6	5,400	3	7.5	23,000	34,500
Parcel 7	9,300	2	4.5	17,000	25,500
Parcel 8-9	9,200	2	4.5	17,000	25,500

Parcel	Area m^2	Under-ground level- No.	H (m)	Flow Rate without a Safety Factor L/day	Flow Rate with a Safety factor x 1.5 L/day
Parcel 10	5,900	3	7.5	24,000	36,000
Parcel 11	8,300	2	4.5	16,000	24,000
Parcel 12	8,600	2	4.5	16,000	24,000
Parcel 13	2,000	-	-	-	-
Parcel 14	4,000	1	1.5	4,000	6,000
Parcel 15	3,800	3	7.5	20,000	30,000
Parcels 16-17	8,200	2	4.5	16,000	24,000
Parcel 18	1,800	-	-	-	-
Parcel 19	3,600	3	7.5	20,000	30,000
Parcels 20-21	5,800	2	4.5	14,000	21,000
Parcel 22	5,700	2	4.5	14,000	21,000
Parcel 23	10,000	1	1.5	6,000	9,000
Parcel 24	12,900	2	4.5	20,000	30,000
Parcel 25	7,400	3	7.5	27,000	40,500
Parcels 26-27	8,300	2	4.5	16,000	24,000
Parcels 27-28	4,600	2	4.5	12,000	18,000
Parcels 29-30	3,700	3	7.5	20,000	30,000
Parcel 31	6,000	2	4.5	14,000	21,000
Parcel 32	3,300	1	1.5	3,000	4,500
Parcel 33	3,400	3	7.5	19,000	28,500

The estimated long-term discharge for a parcel range between 3,000 L/day and 27,000 L/day without a safety factor and 4,500 L/day and 40,500 L/day with a safety factor of x1.5. The dewatering volume for a parcel can be changed depending on the existing grade, sub-drainage depth, hydraulic conductivity of soils or rock and the actual groundwater level encountered during the excavation of a parcel.

4.4 Water-taking Permit Requirements

In the absence of drawings/site plans and construction sequences, DS anticipates that the construction of the proposed construction will be phased. Therefore, permit requirements can be determined once the final design, revised dewatering rates, and construction sequences are available. Below are the regulatory dewatering permit requirements concerning daily discharge volume.

- An EASR or a PTTW is not required for water taking less than 50,000 L/day.
- An Environmental Activity Sector Registration (EASR) is required to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if the taking of groundwater and

stormwater for a temporary construction project is between 50,000 L/day and 400,000 L/ day. The EASR application is an online registry and should be submitted to the MECP before any construction dewatering.

- A PTTW is required to be submitted to the MECP if the taking of groundwater and stormwater for a temporary construction project is more than 400,000 L/ day. The PTTW application is also an online registry and should be submitted to the MECP 90 days from the start of construction dewatering. Dewatering of up to 400,000 L/day is acceptable under an EASR registry.

5.0 POTENTIAL IMPACTS

The following are the predicted potential impacts because of construction dewatering:

5.1 Current PTTW Search

The MECP PTTW Open Data Catalogue was searched within a 1 km radius of the Site. The search indicated that there is one active PTTW within 1 km of the Site. The PTTW details are summarised below. The groundwater interferences from surrounding pumping activities are possible to occur depending on the radius of influence.

Permit Number	Permit Holder Name	Purpose	Specific Purpose	Max Litres per Day	Source Type	Distance (KM)
2216-BPJSE5	The Regional Municipality of Peel	Dewatering Construction	Construction	2590000	Ground Water	0.40

5.2 Source Protection Area

The site is located within the Credit Valley Source Protection Area (SPA). The Credit Valley Source Protection Plan contains policies aimed at protecting drinking water sources by reducing or eliminating significant threats to the source of municipal drinking water. The study area is serviced by municipal water. Therefore, no impacts are anticipated on the drinking water supply within the zone of influence.

5.3 Surface Water

Lake Ontario is not within the zone of influence during construction dewatering. Therefore, surface water impacts due to the short-term dewatering are not expected.

5.4 Local Groundwater Use

The area is fully serviced by a municipal water supply. It is not expected to have any use of groundwater as a source of drinking water within a radius of 500 meters and therefore, there will be no short-term or long-term predicted impacts on private water wells occurring from the proposed dewatering activities.

5.5 Point of Discharge and Groundwater Quality

Groundwater quality analysis indicates that TSS, various total metals and cis- 1,2-Dichloroethene exceeded the sanitary or storm criteria under the Region of Peel's Wastewater Bylaw (53-2010) and the City's Sewer Use Bylaw. Therefore, groundwater at the Site is not suitable for discharge to the Region's or the City's sewer system without treatment. Treatment options include but are not limited to the settlement of suspended solids and filtration to remove fines and associated metals. Discharge permits and agreements are required from the Region of the Peel/City of Mississauga to discharge groundwater into the sewer system.

6.0 MONITORING AND MITIGATION

Based on the finding of hydrogeological assessment and associated potential impacts due to development, the following monitoring and mitigation program is provided:

- Baseline groundwater quality has been assessed and established before construction. However, groundwater quality can change based on several factors (land-use change, spills, etc.) and should be monitored during construction dewatering and after construction to ensure that water quality meets the guideline or regulations associated with any permits from the MECP and the City of Mississauga.

- if a groundwater dewatering system is set up at the Site, daily and weekly monitoring should be implemented to assess the groundwater conditions such as water levels, measurement of discharge flow, discharge water quality and any adverse impacts because of dewatering.

- Following the completion of construction activities, all dewatering wells, well points, eductors and monitoring wells installed at various stages of this project must be decommissioned. The installation and eventual decommissioning of the wells and the dewatering system must be conducted by a licenced water well contractor in accordance with Regulation 903 of the Ontario Water Resources Act.

7.0 LIMITATIONS

This report was prepared for the sole use of the addressee to provide an assessment of the hydrogeological conditions on the property. The information presented in this report is based on information collected during the completion of the hydrogeological investigation by DS Consultants Ltd. DS Consultants Ltd. was required to use and rely upon various information sources produced by other parties. The information provided in this report reflects DS's judgment considering the information available at the time of report preparation. This report may not be relied upon by any other person or entity without the written authorization of DS Consultants Ltd. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or findings, conclusions, and recommendations represented herein, is at the

sole risk of said users. The conclusions drawn from the Hydrogeological report were based on information at selected observation and sampling locations. Different conditions between and beyond these locations may become apparent during future investigations or on-Site work, which could not be detected or anticipated at the time of this investigation. DS Consultants Ltd. cannot be held responsible for hydrogeological conditions at the Site that was not apparent from the available information.

Should you have any questions regarding these findings, please contact the undersigned.

DS Consultants Ltd.

Prepared By:

P.A-Patel

Pradeep Patel, M.Sc. P.Geo.
Hydrogeologist

Reviewed By:

Martin Gedeon

Martin Gedeon, M.Sc., P.Geo.
Senior Hydrogeologist



8.0 CONSULTANTS QUALIFICATIONS

Martin Gedeon, M.Sc., P.Geo. is a Professional Geoscientist (P.Geo.) with over 26 years of experience as an environmental/hydrogeological consultant in the areas of groundwater and soil monitoring, environmental site assessments, environmental due diligence, and remediation. Martin has significant experience in physical and contaminant hydrogeology across Canada and overseas and has provided hydrogeological/environmental technical support on various projects. Martin has prepared hundreds of hydrogeological reports in support of permit applications for a private sector development application, municipal dewatering operations and provincial infrastructure projects across the province.

Pradeep Patel, M.Sc., P.Geo. is a hydrogeologist at DS Consultants Ltd. and has more than 9 years of experience working in the environmental industry. He participates in numerous Hydrogeological and Geotechnical investigation projects. His experience includes the preparation of construction dewatering activities and hydrogeological investigations in support of Environmental Activity and Sector Registry (EASR) and Permit to Take Water (PTTW) applications.

9.0 REFERENCES

Appendix F-Hydrogeology Final Report- Lake Ontario Integrated Shoreline Strategy Background Review and Data Gap Analysis by Credit Valley Conservation, September 12, 2011

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Freeze, R.A., and J.A. Cherry. "Groundwater". Prentice-Hall, Inc. Englewood Cliffs, NJ. 1979.

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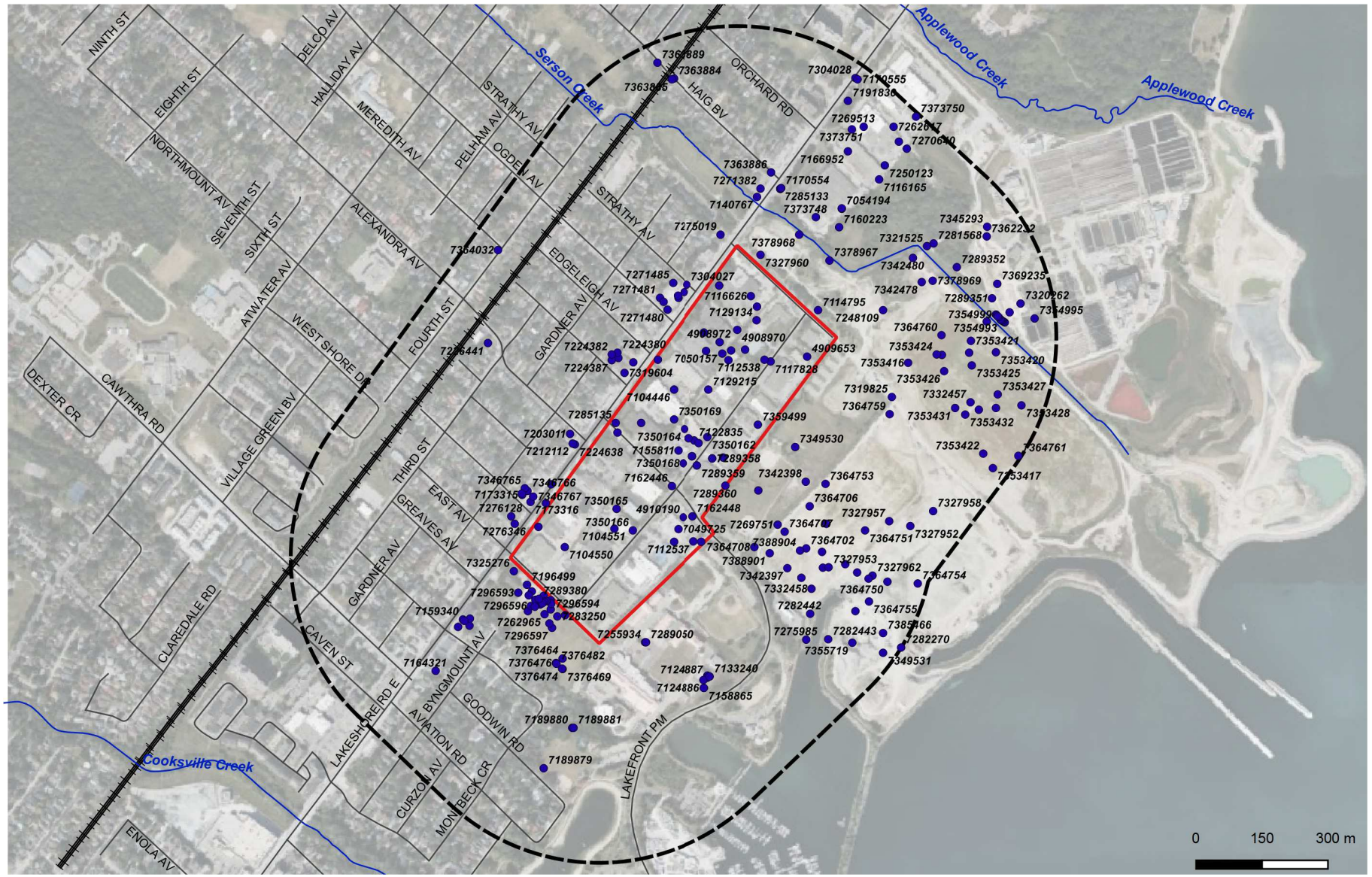
Powers, J. Patrick, P.E. (1992); Construction Dewatering: New Methods and Applications - Second Edition, New York: John Wiley & Sons.

Pat M. Cashman and Martin Preene; Groundwater Lowering in Construction- Second Edition, CRC Press.

The Region of Peel Wastewater Bylaw (53-2010).

FIGURES

C:\0Sharon\22-200-100 Rangeview Estate Precinct Development\1-QGIS\HydroG\Figure 1 – Site Location and MECP Well Records.qgs Oct-05 15:47



Legend

- Approx Property Boundary
- 500m Buffer
- Registered Water Well (MECP WWR)

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Client: RANGEVIEW LANDOWNERS GROUP INC.

Project: HYDROGEOLOGICAL INVESTIGATION
Rangeview Estate Precinct Development, City of Mississauga, ON

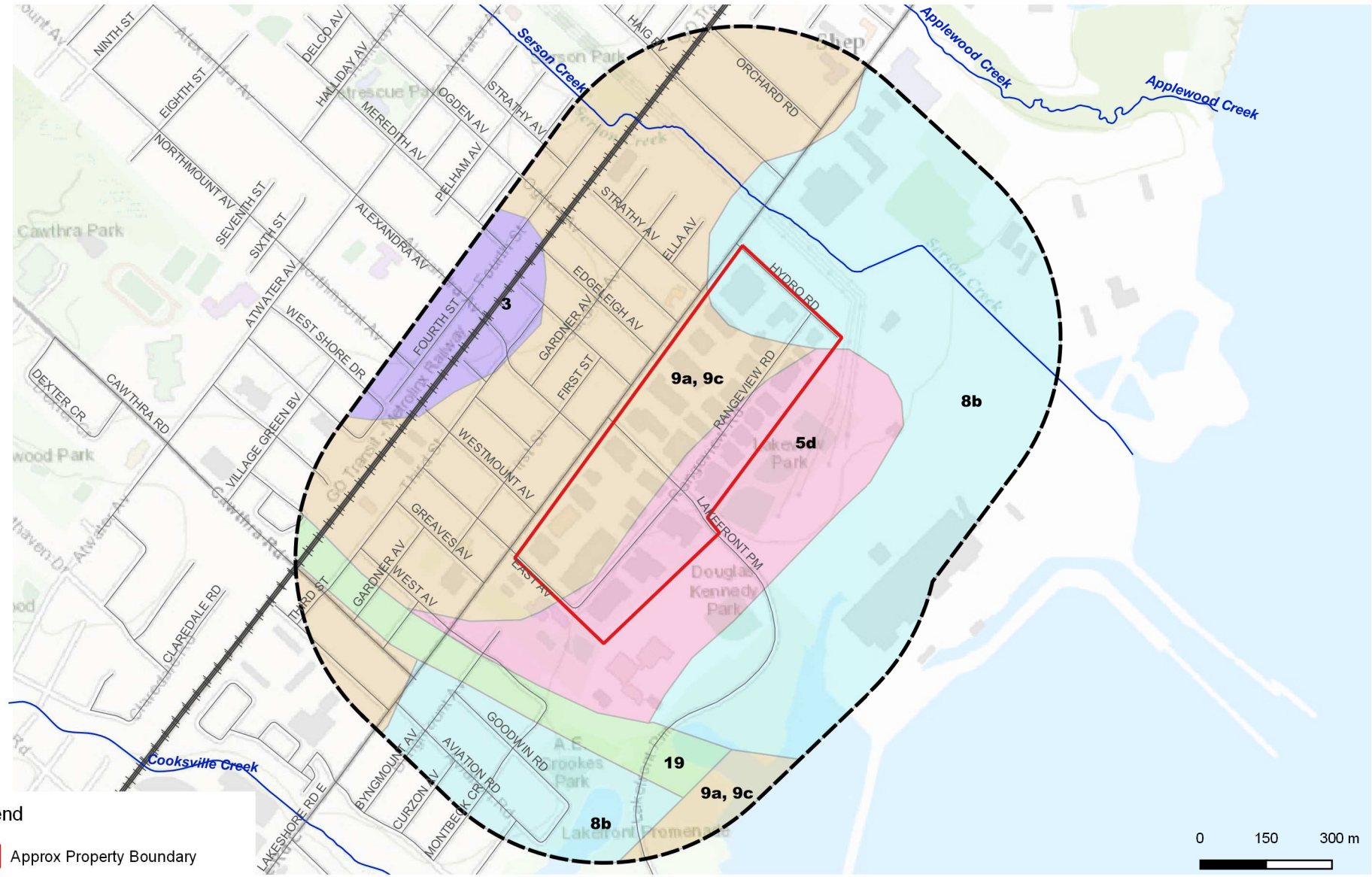
Title: **SITE LOCATION AND MECP WELL RECORDS**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	P.P	S.Y	October 2022
Rev: 0	Scale: As Shown	Project No.: 22-200-100	Figure No.: 1

Image/Map Source: *Bing Satellite Image*

C:\0Sharon\22-200-100 Rangeview Estate Precinct Development\1-QGIS\HydroG\Figure 2 – Surficial Geology Map.qgs Oct-05 16:06



Legend

- Approx Property Boundary
- 500m Buffer
- 19 - Modern Alluvium
- 3 - Bedrock
- 5d - Till
- 8b - Glaciolacustrine Deposits
- 9a & 9c - Coarse-textured Glacial Lake Deposits

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Project: HYDROGEOLOGICAL INVESTIGATION
Rangeview Estate Precinct Development, City of Mississauga, ON

Title: **SURFICIAL GEOLOGY MAP**

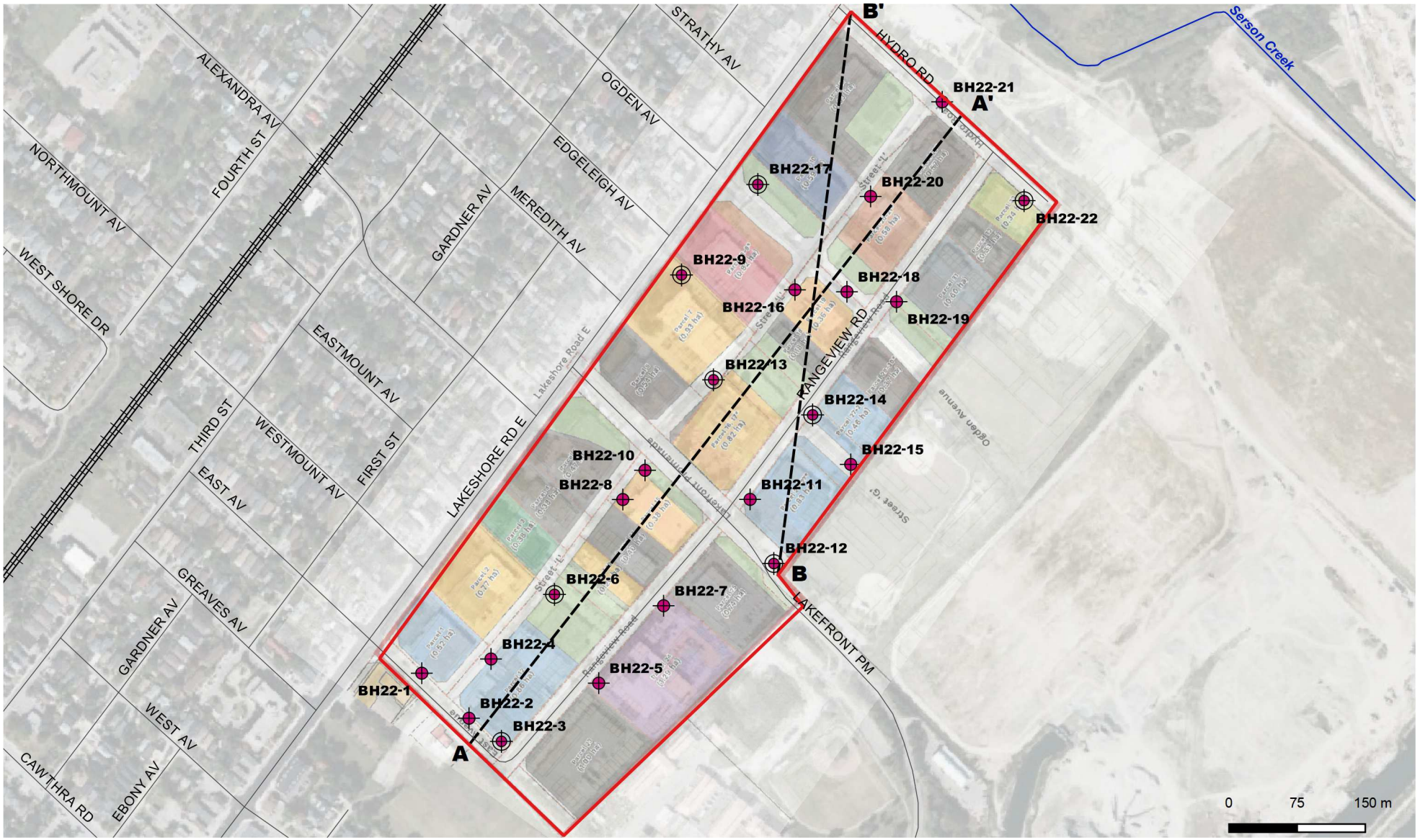
N

Client: RANGEVIEW LANDOWNERS GROUP INC.

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	P.P	S.Y	October 2022
Rev: 0	Scale: As Shown	Project No.: 22-200-100	Figure No.: 2

Image/Map Source: *Bing Satellite Image*

J:\-GIS\2022 PROJECTS\22-200-100 Rangeview Estate Precinct Development\1-QGIS\HydroG\Figure 3 – Borehole and Monitoring Well Locations.qgs May-16 22:18



Legend

- Approx Property Boundary
- Borehole
- Monitoring Well
- Cross Section

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Project: HYDROGEOLOGICAL INVESTIGATION
Rangeview Estate Precinct Development, City of Mississauga, ON

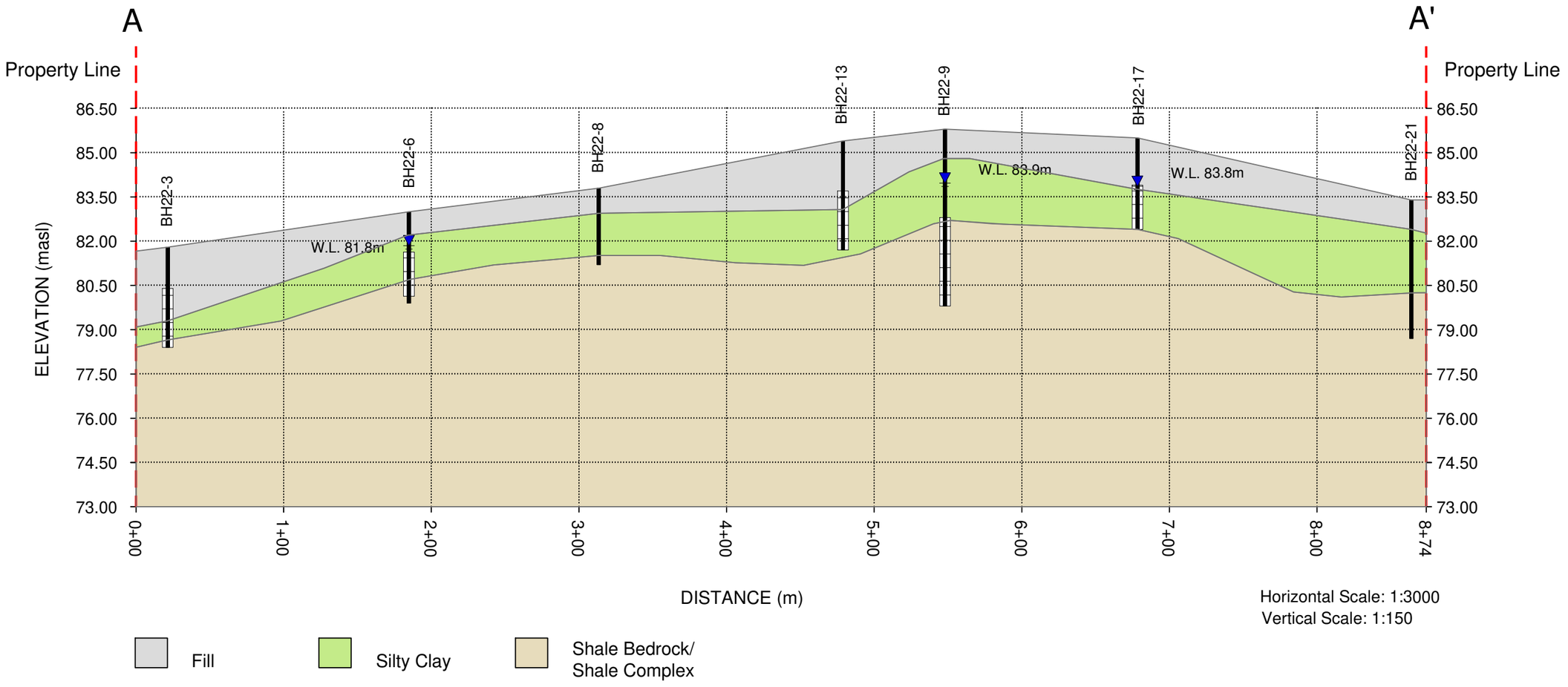
Title: **BOREHOLE AND MONITORING WELL LOCATIONS**

N

Client: RANGEVIEW LANDOWNERS GROUP INC.

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	P.P	S.Y	May 2023
Rev: 0	Scale: As Shown	Project No.: 22-200-100	Figure No.: 3

Image/Map Source: *Bing Satellite Image*



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Client: RANGEVIEW LANDOWNERS GROUP INC.

Project: HYDROGEOLOGICAL INVESTIGATION
Rangeview Estate Precinct Development City of Mississauga, ON

Title: **GEOLOGICAL CROSS SECTION A-A'**

Size:	Approved By:	Drawn By:	Date:
11 X 17	P.P	S.Y	October 2022
Rev.	Scale:	Project No:	Figure No.
	A Shown	22-200-100	**4A**

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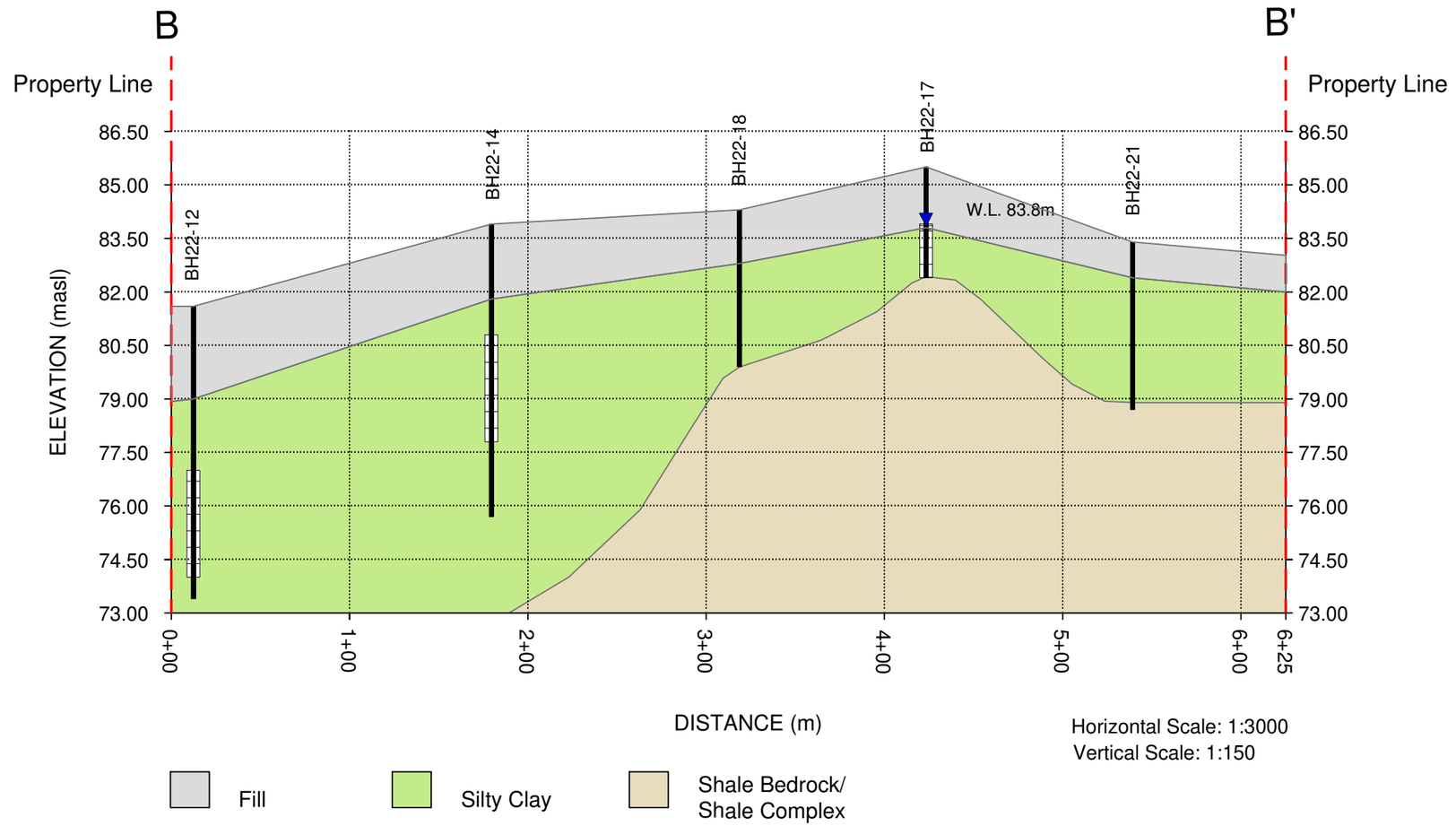

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Client: RANGEVIEW LANDOWNERS GROUP INC.

Project: HYDROGEOLOGICAL INVESTIGATION
Rangeview Estate Precinct Development City of Mississauga, ON

Title: **GEOLOGICAL CROSS SECTION B-B'**

Size:	Approved By:	Drawn By:	Date:
11 X 17	P.P	S.Y	October 2022
Rev.	Scale: A Shown	Project No: 22-200-100	Figure No. **4B**

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APPENDICES

Appendix A: Borehole Logs

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LOG OF BOREHOLE BH22-1

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825344.14 E 616049.35

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-19-2022

REF. NO.: 22-200-100
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.6												
82.6	**ASPHALT:** 150mm											
0.2	**GRANULAR BASE:** sand and gravel, 500mm		1	SS	13							
82.0												
0.8	**FILL:** sand, trace brick pieces, some clay, trace organics, trace gravel, brown, moist, compact		2	SS	8		82					
1	**FILL:** silty clay, trace sand, trace organics, trace gravel, brown, moist, stiff to very stiff		3	SS	17		81					4 7 62 27
2												
80.3												
2.3	**SILTY CLAY:** trace sand, trace gravel, greyish brown, moist, hard		4	SS	50/ 75mm		80					
3												
79.5												
3.1	**SHALE BEDROCK:** grey, weathered		5	SS	50/ 100mm							
79.3												
3.3	**END OF BOREHOLE:**											

Notes:
1) Borehole dry upon completion.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG-2021-FINAL 22-200-100 GEO COPY.GPJ DS.GDT 22-9-12

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LOG OF BOREHOLE BH22-2

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825294.58 E 616101.31

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-19-2022

REF. NO.: 22-200-100
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.7 / 0.0	**ASPHALT:** 130mm											
81.6 / 0.1	**GRANULAR BASE:** sand and gravel, 460mm		1	SS	8				○			
81.1 / 0.6	**FILL:** sand and gravel, trace silt, trace clay, trace asphalt pieces, grey, moist, loose						81					
80.9 / 0.8	**FILL:** silty clay, some organics, trace gravel, grey, moist, firm to hard		2	SS	7					○		
80.0 / 1.7	**SILTY CLAY:** trace sand, trace gravel, occasional cobble, brown, moist, hard		3	SS	50/ 100mm		80			○		
			4	SS	50/ 100mm		79			○		
78.5 / 3.2	**SHALE BEDROCK:** grey, weathered		5	SS	50/ 100mm							
78.1 / 3.6	**END OF BOREHOLE:** Notes: 1) Borehole dry upon completion.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-3

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825269.07 E 616136.98

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-22-2022

REF. NO.: 22-200-100
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.8												
81.7	**ASPHALT:** 100mm											
0.1	**GRANULAR BASE:** sand and gravel, 450mm		1	SS	7							
81.3												
0.6	**FILL:** silty clay, trace to some organics, trace concrete pieces, trace gravel, trace asphalt, grey, moist, firm to stiff		2	SS	5		81					
1												
2			3	SS	11		80					
79.3												
2.5	**SILTY CLAY TILL:** some sand, trace gravel, occasional cobble, brown, moist, hard		4	SS	57		79					8 18 48 26
3												
78.7												
3.1	**SHALE BEDROCK:** grey, weathered		5	SS	50/ 130mm							
78.4												
3.4	**END OF BOREHOLE:**											

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
Aug 25, 2022	dry

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-4

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825359.79 E 616125.51

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.3 / 0.0	**ASPHALT:** 180mm											
82.1 / 0.2	**GRANULAR BASE/SUB BASE:** sand and gravel, 460mm, crusher run limestone (160mm)		1	SS	4		82					
81.5 / 0.8	**SILTY CLAY:** trace sand, trace gravel, brown, moist, very stiff to hard		2	SS	17		81					2 8 62 28
			3	SS	30							
80.0 / 2.3	**SILTY CLAY TILL:** sandy, trace gravel, brown, moist, hard		4	SS	50/ 25mm		80					
79.9 / 2.4	**SHALE BEDROCK:** Georgian Bay Formation, grey, weathered TCR=75%, SCR=14%, RQD=0		R1	RC	50/ 75mm							
78.9 / 3.4	TCR=96%, SCR=98%, RQD=28% Hard layer=18%, Maximum hard layer thickness=50mm		R2	RC			79					
77.4 / 4.9	TCR=93%, SCR=90%, RQD=63% Hard layer=5%, Maximum hard layer thickness=25mm		R3	RC			78					
75.9 / 6.4	TCR=100%, SCR=98%, RQD=70% Hard layer=9%, Maximum hard layer thickness=25mm		R4	RC			77					
74.5 / 7.8	**END OF BOREHOLE:**						76					
							75					

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH22-5

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825333.22 E 616244.07

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-19-2022

REF. NO.: 22-200-100
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.7								
81.6	**ASPHALT:** 76mm							
0.1 / 81.2	**GRANULAR BASE:** sand and gravel, 400mm		1	SS	4			
0.5 / 80.3	**FILL:** silty clay, trace asphalt pieces, sandy, trace concrete pieces, greyish brown, moist, firm to very stiff		2	SS	18		81	
1.4 / 79.4	**FILL:** sand and gravel, cobbles and boulders, grey, moist, very dense		3	SS	50/ 75mm		80	Auger grinding
2.3 / 78.6	**SILTY CLAY TILL:** trace sand, some gravel, greyish brown, moist, hard		4	SS	50/ 25mm		79	14 9 57 20
78.5	**SHALE BEDROCK:** grey,		5	SS	50/ 50mm			
3.2	weathered **END OF BOREHOLE:** Notes: 1) Borehole dry at bottom upon completion.							

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100
PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30
POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

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LOG OF BOREHOLE BH22-6

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825430.9 E 616195.37

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
83.0 / 0.0	**ASPHALT:** 200mm						
82.8 / 0.2	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	8		
82.4 / 0.6	**FILL:** silty clay, trace sand, trace gravel, some organics, brown, moist, stiff						
82.2 / 0.8	**SILTY CLAY TILL:** some sand, trace gravel, brown, moist, stiff to hard		2	SS	11		82
	trace shale fragments below 1.5m		3	SS	50	W. L. 81.8 m Aug 25, 2022	81
80.7 / 2.3	**SHALE BEDROCK:** grey, weathered		4	SS	50/ 50mm		80
79.9 / 3.1	**END OF BOREHOLE:**						

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
Aug 25, 2022	1.15

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-7

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825418.42 E 616315.42

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-19-2022

REF. NO.: 22-200-100
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.0												
80.0 / 0.0	**ASPHALT:** 130mm											
0.1 / 81.6	**GRANULAR BASE:** sand and gravel, 400mm		1	SS	7							
0.4	**FILL:** silty clay, trace to some organics, trace concrete pieces, trace metal piece, cobbles, trace sand, grey, moist, firm to stiff		2	SS	8		81					Auger grinding @1.5m
80.5												
1.5	**SILT CLAY TILL:** some sand, some gravel, greyish brown, moist, hard		3	SS	73							19 17 43 21
			4	SS	43		80					
79.2												
2.8	**SHALE BEDROCK:** grey, weathered											
78.8			5	SS	50/ 130mm		79					
3.2	**END OF BOREHOLE:**											

Notes:
1) Borehole is dry at bottom upon completion after drilling.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-8

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825535.37 E 616270.56

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.: 9

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.8												
83.7 0.0	**ASPHALT:** 130mm											
0.1 83.3	**GRANULAR BASE:** sand and gravel, 330mm		1	SS	12							
0.5 83.0	**FILL:** silty clay, trace organics, trace gravel, brown, moist, stiff						83					
0.8	**CLAYEY SILT TILL/SHALE COMPLEX:** trace sand, trace gravel, brown to grey, moist, stiff to hard		2	SS	14							no recovery
			3	SS	53		82					
81.5												
2.3 81.2	**SHALE BEDROCK:** weathered, grey		4	SS	50/ 150mm							
2.6	**END OF BOREHOLE:** Notes: 1) Borehole is dry at bottom upon completion after drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-9

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825782.63 E 616335.18

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-23-2022

REF. NO.: 22-200-100
ENCL NO.: 10

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
85.8												
85.8 / 0.0	**ASPHALT:** 150mm											
85.6 / 0.2	**GRANULAR BASE:** sand and gravel, 330mm		1	SS	8				○			
85.3 / 0.5	**FILL:** silty clay, trace to some organics, trace gravel, grey, moist, stiff						85					
1 84.8 / 1.0	**SILTY CLAY TILL:** trace to some sand, trace gravel, brown, moist, very stiff to hard		2	SS	18				○			
			3	SS	50/ 130mm	▽	84		○			
2						W. L. 83.9 m Aug 25, 2022						
	trace shale fragments@2.3m		4	SS	50/ 130mm				○			
3 82.8							83					
82.7 / 3.1	**SHALE BEDROCK:** weathered, grey		5	SS	50/ 130mm							
82.5 / 3.3	TCR=100%, SCR=1%, RQD=0% Hard layer=0%, Maximum hard layer thickness=0mm		R1	RC								
	TCR=100%, SCR=86%, RQD=56% Hard layer=25%, Maximum hard layer thickness=100mm		R2	RC			82					
4 81.0 / 4.8	TCR=96%, SCR=86%, RQD=72% Hard layer=20%, Maximum hard layer thickness=100mm		R3	RC			81					
5												
6 79.8 / 6.0	**END OF BOREHOLE:** Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Aug 25, 2022 1.83						80					

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-10

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825567.54 E 616294.99

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-19-2022

REF. NO.: 22-200-100
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.9												
83.8	**ASPHALT:** 100mm											
0.1	**GRANULAR BASE:** sand and gravel, 480mm		1	SS	8							
83.4												
0.6	**FILL:** silty clay, trace organics, trace gravel, trace sand, grey, moist, stiff to very stiff											
1 82.9			2	SS	18		83					
1.0	**SILTY CLAY TILL:** sandy, trace gravel, grey, moist, very stiff to hard											
			3	SS	40							
2 81.7							82					
2.2	**CLAYEY SILT TILL/SHALE COMPLEX:** trace sand, trace gravel, trace cobbles, grey, moist, hard		4	SS	50/ 75mm							Water at 2.4m
3 80.8							81					
80.7	**SHALE BEDROCK:** grey,		5	SS	50/ 50mm							
3.2	weathered											
	END OF BOREHOLE:											
	Notes:											
	1) Borehole wet at the bottom upon completion adter drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-11

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825535.51 E 616410.91

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-23-2022

REF. NO.: 22-200-100
ENCL NO.: 12

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"
83.1 / 0.0	**TOPSOIL:** 250mm			
82.9 / 0.3	**FILL:** silty clay, trace organics, trace tospoil, trace rootlets, trace sand, brown, moist, firm to stiff	1	SS	9
		2	SS	7
81.6 / 1.5	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble, brown, moist, very stiff to hard	3	SS	50/ 75mm
	grey below 2.3m	4	SS	30
		5	SS	22
		6	SS	17
77.0				
76.9 / 6.2	**SHALE BEDROCK:** grey, weathered	7	SS	50/ 25mm
	END OF BOREHOLE:			
	Notes:			
	1) Borehole is wet at bottom upon completion after drilling.			

STRATA PLOT | GROUND WATER CONDITIONS | ELEVATION

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-12

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825464.89 E 616436.99

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-22-2022

REF. NO.: 22-200-100
ENCL NO.: 13

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
81.6 / 0.0	**ASPHALT:** 130mm				
0.1 / 81.2	**GRANULAR BASE:** sand and gravel, 400mm	1	SS	10	81
0.4 / 80.8	**FILL:** sand mixed with black organics, some silt, trace gravel, trace asphalt, black, moist, compact				
0.8 / 1	**FILL:** silty clay, some organics, trace sand, trace gravel, grey, moist, firm	2	SS	5	
		3	SS	6	80
2 / 79.2					
2.4	**SILTY CLAY TILL:** some sand to sandy, trace gravel, brown, moist, hard	4	SS	43	79
3	grey below 3.1m	5	SS	42	
					78
4		6	SS	35	
					77
5		7	SS	47	
					76
6		8	SS	39	
					75
7					
					74
8 / 73.4		9	SS	45	
8.2	**END OF BOREHOLE:**				

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
Aug 25, 2022	dry

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-13

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825667.17 E 616370.55

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-19-2022

REF. NO.: 22-200-100
ENCL NO.: 14

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
85.4												
85.2 0.0	**ASPHALT:** 180mm											
0.2	**GRANULAR BASE/SUB BASE:** sand and gravel, 380mm, crusher run limestone (200mm)		1	SS	23		85					
84.6												
1 0.8	**FILL:** silty clay, some organics, some sand, trace gravel, grey, moist, stiff to very stiff		2	SS	10		84					
			3	SS	22	W. L. 83.8 m Aug 25, 2022						
2 83.1												
2.3	**SILTY CLAY TILL:** some sand, some gravel, brown, moist, hard		4	SS	50		83					13 18 47 22
3	trace shale fragments below 3.0m		5	SS	75		82					
81.7												
3.7	**END OF BOREHOLE:** Notes: 1) Augar refusal @3.7m on possible boulder or bedrock. 2) 50mm dia. monitoring well installed upon completion. 3) Water Level Readings: Date: Water Level(mbgl): Aug 25, 2022 1.57											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-14

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825628.56 E 616479.7

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-23-2022

REF. NO.: 22-200-100
ENCL NO.: 15

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
83.9					
83.7 / 0.0	**ASPHALT:** 150mm				
83.5 / 0.2	**GRANULAR BASE:** sand and gravel, 430mm	1	SS	13	
0.4	**FILL:** silty clay, some organics, trace gravel, trace sand, trace asphalt, grey, moist, firm to very stiff	2	SS	4	83
		3	SS	26	82
81.8 / 2.1	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble, brown, moist, very stiff to hard	4	SS	42	
		5	SS	66	81
	grey below 3.9m				80
		6	SS	46	79
		7	SS	46	78
					77
75.7 / 8.2	**END OF BOREHOLE:**	8	SS	36	76

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date: Water level(mbgl):
Aug 25, 2022 dry

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-15

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825574.05 E 616521.61

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.: 16

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
83.3							
0.0 / 83.0	**GRANULAR FILL:** sand and gravel, 280mm		1	SS	21		83
0.3 / 82.5	**FILL:** sand & gravel, trace brick pieces, grey, moist, compact						
0.8 / 81.8	**FILL:** silty clay, trace to some organics, grey, moist, firm		2	SS	5		82
1.5 / 81.0	**SILTY CLAY:** trace sand, trace gravel, brown, moist, stiff		3	SS	11		
2.3	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble, brown, moist, hard		4	SS	44		81
			5	SS	86		80
			6	SS	47		79
	grey below 6.1m		7	SS	50		78
							77
8.2 / 75.1			8	SS	46		76
	END OF BOREHOLE: Notes: 1) Borehole is wet at bottom upon completion after drilling.						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-16

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825766.27 E 616460.23

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-18-2022

REF. NO.: 22-200-100
ENCL NO.: 17

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
84.6												
84.4	**ASPHALT:** 150mm											
0.2 / 84.2	**GRANULAR BASE:** sand and gravel, 250mm		1	SS	9							
0.4	**FILL:** silty clay, some organics, some sand, trace gravel, grey, moist, stiff						84					
1 / 83.4			2	SS	11							
1.2	**CLAYEY SILT TO SILT:** trace sand, brown, moist, stiff to hard						83					0 7 76 17
2 / 82.3			3	SS	30							
2.3	**CLAYEY SILT:**, trace sand, trace gravel, brown, moist, hard		4	SS	77		82					
3 / 81.5												
81.4	**SHALE BEDROCK:** grey,		5	SS	50/							
3.2	weathered				130mm							
	END OF BOREHOLE:											
	Notes:											
	1) Borehole is dry at bottom upon completion after drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-17

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825882.25 E 616419.37

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-18-2022

REF. NO.: 22-200-100
ENCL NO.: 18

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
85.5												
85.3	**ASPHALT:** 150mm											
0.2	**GRANULAR BASE/SUB BASE:** sand and gravel, 380mm, crusher run limestone (300mm)		1	SS	12		85					
84.7												
0.8	**FILL:** clayey silt, trace organics, grey, moist, firm to very stiff		2	SS	7		84					
83.8												
1.7	**SILTY CLAY TILL:** some sand, trace to some gravel, trace shale fragements, brown, moist, very stiff to hard		3	SS	29	W. L. 83.8 m Aug 25, 2022						
			4	SS	54		83					10 10 56 24
82.4	augar refusal at 3.1m on possible boulder or bedrock											
3.1	**END OF BOREHOLE:**											

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
Aug 25, 2022	1.64

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-18

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825764.09 E 616517.47

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-18-2022

REF. NO.: 22-200-100
ENCL NO.: 19

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
84.3 / 0.0	**ASPHALT:** 130mm						
0.1 / 83.8	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	16		84
0.5	**FILL:** silty clay, some organics, trace asphalt, grey, moist, firm to very stiff		2	SS	6		
1 / 82.8							83
1.5	**CLAYEY SILT TO SILT:** trace sand, trace gravel, brown to grey, moist, very stiff to hard		3	SS	15		
2			4	SS	31		82
3			5	SS	29		81
4 / 79.9			6	SS	50/ 25mm		80
4.4	**END OF BOREHOLE:** Notes: 1) No recovery@4.3m, augar refusal on possible boulder or bedrock at 4.4m. 2) Borehole was wet at botttom upon completion of drilling.						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-19

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825753.18 E 616572.03

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-23-2022

REF. NO.: 22-200-100
ENCL NO.: 20

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	BLOWS "N" 0.3 m	ELEVATION
83.6 / 0.0	**ASPHALT:** 150mm				
83.4 / 0.2	**GRANULAR BASE:** sand and gravel, 230mm	1	SS	23	83
83.3 / 0.4	**FILL:** clayey silt, sandy, trace gravel, greyish brown, moist, very stiff				
82.8 / 0.8	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble, brown, moist, hard	2	SS	31	
1		3	SS	50/100mm	82
2	grey below 2.3m	4	SS	56	81
3		5	SS	42	
4					80
		6	SS	34	79
5					
6		7	SS	41	78
7					77
8		8	SS	45	76
75.4 / 8.2	**END OF BOREHOLE:** Notes: 1) Borehole is wet at the bottom upon completion after drilling.				

SOIL PROFILE | SAMPLES | GROUND WATER CONDITIONS | ELEVATION

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-20

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825869.08 E 616543.51

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-23-2022

REF. NO.: 22-200-100
ENCL NO.: 21

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.7											
80.8 0.1	**GRANULAR FILL:** sand and gravel, 130mm										
	FILL: silty clay, trace sand, trace organics, greyish brown, moist, stiff to very stiff		1	SS	14		83		○		
1 82.7											
1.0	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble, brown, moist, very stiff to hard		2	SS	19				○		
			3	SS	50/ 50mm		82		○		
2 81.4											
2.3 81.2	**SHALE BEDROCK:** grey, weathered		4	SS	50/ 25mm						
2.5	**END OF BOREHOLE:**										
	Notes: 1) Borehole is dry at bottom upon completion after drilling.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-21

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825973.2 E 616622.29

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-19-2022

REF. NO.: 22-200-100
ENCL NO.: 22

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.4 / 0.0	**ASPHALT:** 150mm											
0.2 / 82.9	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	13		83					
0.5 / 82.4	**FILL:** sand, some asphalt pieces, trace gravel, dark brown, moist, loose to compact		2	SS	8							
1.0	**SILTY CLAY:** trace sand, brown, moist, stiff to very stiff		3	SS	20		82					0 4 68 28
80.3			4	SS	25		81					
3.1 / 78.9	**CLAYEY SILT TILL/SHALE COMPLEX:** trace sand, trace gravel, grey, moist, hard		5	SS	69		80					
4.5 / 78.7	**SHALE BEDROCK:** grey, weathered		6	SS	50/ 50mm		79					
4.7	**END OF BOREHOLE:** Notes: 1) Borehole is dry at bottom upon completion after drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-22

PROJECT: Geotechnical Investigation
CLIENT: Landowners Group Inc.
PROJECT LOCATION: Rangeview Estates Precinct Area, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825864.46 E 616712.36

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Aug-22-2022

REF. NO.: 22-200-100
ENCL NO.: 23

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
83.1 / 0.0	**ASPHALT:** 130mm				83
0.1 / 82.6	**GRANULAR BASE:** sand and gravel, 430mm	1	SS	4	
0.5	**FILL:** silty clay, trace to some organics, some sand, trace concrete piece, grey, moist, firm to stiff	2	SS	10	82
81.7					
1.4	**SILTY CLAY TILL:** some sand to sandy, trace gravel, occasional cobble, brown, moist, very stiff to hard	3	SS	40	
	grey below 2.3m	4	SS	41	81
		5	SS	32	80
		6	SS	28	79
		7	SS	40	78
	silt seams @7.6m	8	SS	48	77
74.9					76
8.2	**END OF BOREHOLE:**				75

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date:	Water Level(mbgl):
Aug 25, 2022	dry

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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Appendix B: MECP Water Wells Records

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

TOWNSHIP C	E	N	DATE CNTR	CASING	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
MISSISSAUGA CITY	616386	4825953	2016/08 3349	2					7271484	
MISSISSAUGA CITY	616374	4825987	2016/08 3349	2					7271485	
MISSISSAUGA CITY	616075	4825265	2016/09 7472	2			MO	0005 10	7272677	BRWN FILL 0005 BRWN SAND CLAY 0010 BRWN SAND 0015
MISSISSAUGA CITY	616484	4826097	2016/08 7075	2			MO	0010 10	7275019	BRWN SILT CLAY HARD 0008 GREY SILT CLAY HARD 0014 GREY SHLE HARD 0020
MISSISSAUGA CITY	616679	4825174	2016/08 7215	2	10		TH	0006 5	7275985	BRWN CLAY GRNT DRY 0005 GREY SHLE 0011
MISSISSAUGA CITY	616005	4825455	2016/08 7215						7276128	
MISSISSAUGA CITY	616013	4825438	2016/07 7215						7276346	
MISSISSAUGA CITY	616150	4825619	2014/05 6946						7224638	
MISSISSAUGA CITY	616895	4825156	2016/12 7464						7282270	
MISSISSAUGA CITY	616344	4825953	2016/08 3349	2					7271481	
MISSISSAUGA CITY	616688	4825233	2016/11 7215	2			TH	0020 5	7282442	FILL 0007 CLAY SILT 0018 SHLE WTHD 0025
MISSISSAUGA CITY	616729	4825175	2016/11 7215	2			TH	0005 15	7282443	FILL 0005 CLAY SILT TILL 0018 SHLE WTHD 0020
MISSISSAUGA CITY	616095	4825243	2017/02 7472						7283249	
MISSISSAUGA CITY	616110	4825227	2017/02 7472						7283250	
MISSISSAUGA CITY	616096	4825528	2017/02 7472						7283251	
MISSISSAUGA CITY	616079	4825274	2017/02 7472						7283252	
MISSISSAUGA CITY	616969	4826077	2016/06 6032	2			MO	0012 10	7281568	
MISSISSAUGA CITY	616095	4825264	2016/03 7360	2			MO	0010 5	7262964	BRWN FILL 0010 GREY DNSE HARD 0015
MISSISSAUGA CITY	616043	4825239	2014/10 7241	2			MT	0007 5	7231445	
MISSISSAUGA CITY	616854	4825925	2015/06 6032						7248109	
MISSISSAUGA CITY	616858	4826255	2015/01 7215						7250123	
MISSISSAUGA CITY	616310	4825168	2015/12 7403	2	UT 0025		MO	0020 10	7255934	BRWN SAND SHLE FILL 0002 GREY SHLE ROCK 0030
MISSISSAUGA CITY	616400	4825966	2016/08 3349	2					7271483	
MISSISSAUGA CITY	616128	4825230	2015/03 7360	2			MO	0010 5	7262963	BRWN FILL 0010 GREY DNSE HARD 0015
MISSISSAUGA CITY	616352	4825944	2016/08 3349	2					7271482	
MISSISSAUGA CITY	616081	4825232	2015/03 7360	2	UT 0005		MO	0015 5	7262965	BRWN FILL 0015 GREY DNSE HARD 0020
MISSISSAUGA CITY	616810	4826343	2015/12 7215						7269513	
MISSISSAUGA CITY	616614	4825436	2014/12 7215						7269751	
MISSISSAUGA CITY	616908	4826293	2015/09 7215						7270640	
MISSISSAUGA CITY	616575	4826202	2016/06 7215						7271382	
MISSISSAUGA CITY	616361	4825926	2016/07 3349	2					7271480	
MISSISSAUGA CITY	616620	4826201	2017/03 7148						7285134	
MISSISSAUGA CITY	616878	4826343	2015/03 6607						7262617	
MISSISSAUGA CITY	616791	4826454	2018/01 7610						7304028	

Table: MECP Water Wells Records (500 m Radius)

Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616096	4825256	2017/08 7241	2			OT	0010 10	7296594	
MISSISSAUGA CITY	616085	4825262	2017/08 7241	2			OT	0010 10	7296595	
MISSISSAUGA CITY	616050	4825251	2017/08 7241	2			OT	0010 10	7296596	
MISSISSAUGA CITY	616098	4825201	2017/08 7241	2			OT	0010 10	7296597	
MISSISSAUGA CITY	616071	4825254	2017/08 7241	2			OT	0010 10	7296598	
MISSISSAUGA CITY	616092	4825211	2017/08 7241	2			OT	0010 10	7296599	
MISSISSAUGA CITY	616406	4825983	2018/01 7610						7304027	
MISSISSAUGA CITY	616263	4825782	2018/05 7295	1.79			MO	0015 10	7319604	BLCK LOAM 0002 GREY FILL DRY 0005 LMSN DRY 0025
MISSISSAUGA CITY	616283	4825806	2018/05 7295	1.79			MO	0015 10	7319605	BLCK LOAM 0002 GREY FILL DRY 0005 ROCK LMSN 0025
MISSISSAUGA CITY	616249	4825816	2018/05 7295	1.79			MO	0015 10	7319606	BLCK LOAM ---- 0002 GREY FILL DRY 0005 ROCK LMSN DRY 0025
MISSISSAUGA CITY	616874	4825727	2018/07 7472	2			MO	0040 10	7319825	BRWN GRVL FILL SOFT 0005 BRWN TILL CLAY 0050
MISSISSAUGA CITY	616954	4826071	2018/01 7383	2			TH MO	0015 10	7321525	SILT SAND 0025
MISSISSAUGA CITY	616080	4825260	2017/08 7241	2			OT	0010 10	7296600	
MISSISSAUGA CITY	616430	4825571	2017/01 7383	2			TH MO	0010 10	7289359	SILT TILL 0020
MISSISSAUGA CITY	616234	4825811	2014/06 7241	2			MT	0008 10	7224387	BRWN SILT SAND 0007 GREY SHLE 0018
MISSISSAUGA CITY	616243	4825668	2017/03 7148						7285135	
MISSISSAUGA CITY	616052	4825284	2017/04 7383	2			TH	0012 5	7288973	SAND GRVL 0005 CLAY SLTY 0010 SHLE 0017
MISSISSAUGA CITY	616045	4825275	2017/04 7383	2			TH	0012 5	7288974	SAND GRVL 0005 CLAY SLTY 0010 SHLE 0017
MISSISSAUGA CITY	616063	4825257	2017/04 7383	2			TH	0012 5	7288975	SAND GRVL 0005 CLAY SLTY 0010 SHLE 0017
MISSISSAUGA CITY	616312	4825168	2017/05 6875				MO		7289050	
MISSISSAUGA CITY	617102	4825952	2016/10 7383	2			TH MO	0017 10	7289351	
MISSISSAUGA CITY	616021	4825281	2017/08 7241	2			OT	0010 10	7296593	
MISSISSAUGA CITY	616465	4825587	2017/01 7383	2			TH MO	0010 10	7289358	SILT TILL 0020
MISSISSAUGA CITY	616620	4826202	2017/03 7148						7285133	
MISSISSAUGA CITY	616495	4825525	2017/02 7383	2			TH	0035 10	7289360	SILT CLAY TILL 0045
MISSISSAUGA CITY	616465	4825587	2017/02 7383	2			TH	0037 10	7289361	SILT CLAY TILL 0047
MISSISSAUGA CITY	616430	4825571	2017/02 7383	2			TH	0027 10	7289362	SILT CLAY TILL 0037
MISSISSAUGA CITY	616060	4825265	2017/02 7383	2			TH	0009 5	7289377	
MISSISSAUGA CITY	616059	4825249	2017/02 7383	2			TH	0012 5	7289378	
MISSISSAUGA CITY	616076	4825257	2017/02 7383	2			TH	0012 5	7289379	
MISSISSAUGA CITY	616068	4825267	2017/02 7383	2			TH	0012 5	7289380	
MISSISSAUGA CITY	617022	4826023	2016/10 7383	2			TH MO	0013 10	7289352	
MISSISSAUGA CITY	616566	4825902	2008/01 6607	1.25			MO		7129134	BRWN SAND GRVL 0001 BRWN SILT SAND CLAY 0009 GREY SHLE LMSN FCRD 0025
MISSISSAUGA CITY	616598	4825808	2008/11 7215				TH	0013 10	7117828	BRWN CLAY 0008 GREY CLAY 0016 GREY CLAY WBRG 0023

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616424	4825628	2009/04 7241	1.25			MO		7122835	BRWN CLAY TILL 0008 RED SHLE WTHD 0014
MISSISSAUGA CITY	616454	4825092	2009/04 1663	2	UT	//4/1:0	MO	0013 5	7124885	GREY CLAY SAND GRVL 0013 GREY CLAY SAND SILT 0018
MISSISSAUGA CITY	615952	4825850	2014/07 6902	2	OT			0017 10	7226441	GREY CLAY SILT 0002 GREY SILT CLAY DNSE 0006 BRWN SILT SHLE 0012 GREY SHLE DRY 0025 GREY SHLE DRY 0028
MISSISSAUGA CITY	616453	4825087	2009/04 1663	6.11	UT	13/20/100/1:0	TH	0071 4 007	7124887	GREY CLAY SAND STNS 0027 GREY CLAY STNS SILT 0071 GREY CSND GRVL 0078
MISSISSAUGA CITY	616553	4825957	2008/11 7147	1.97			NU		7116626	GREY CMTD 0001 BRWN FILL 0002 BRWN TILL 0010 BRWN SHLE
MISSISSAUGA CITY	616456	4825744	2008/02 6607	1.25	FR 0028		MO		7129215	BRWN SAND GRVL FILL 0002 BRWN SILT CLAY SAND 0009 GREY SILT CLAY SAND 0013 GREY SHLE LMSN FCRD 0030
MISSISSAUGA CITY	615910	4825206	2009/07 7247	2			MO	0007 10	7130477	BRWN LOAM LOOS 0000 BRWN SAND CLAY SLTY 0004 BRWN CLAY TILL SLTY 0010 GREY SHLE DNSE 0017
MISSISSAUGA CITY	616446	4825064	2009/09 3413	8	FR 0072		DE	0079 5	7133239	GREY CLAY 0033 BRWN SAND 0038 GREY CLAY 0072 GRVL CGVL 0084
MISSISSAUGA CITY	616459	4825090	2009/09 3413	8	FR 0072		DE	0090 5 008	7133240	GREY CLAY 0033 BRWN SAND 0036 GREY CLAY 0072 GRVL CGVL 0095
MISSISSAUGA CITY	616567	4826183	2009/11 6809				MT		7140767	GREY TILL 0012 GREY SHLE ROCK 0015
MISSISSAUGA CITY	616453	4825087	2010/02 6875	5.9			TH	0071 7	7143015	
MISSISSAUGA CITY	616445	4825082	2009/04 1663	2		//10/1:0	NU	0064 10	7124886	GREY CLAY GRVL SAND 0018 GREY SAND CLAY 0023 GREY CLAY SAND GRVL 0027 GREY CLAY SILT STNS 0068 GREY CSND GRVL 0074 GREY CLAY 0074
MISSISSAUGA CITY	616240	4825427	2007/12 7241	1.22			MO		7104551	BRWN SAND 0001 BRWN SILT GRVL CLAY 0005 GREY SILT GRVL CLAY 0007 GREY SHLE ROCK 0025
MISSISSAUGA CITY	616451	4825832	2007/07 7230	2			NU	0008 3	7050157	BRWN GRVL DNSE 0001 BRWN CLAY HARD 0004 GREY CLAY DNSE 0010 GREY SHLE HARD 0011
MISSISSAUGA CITY	616084	4825485	2007/09 7238	2	8			0015 10	7051983	BRWN SAND GRVL 0003 BRWN SILT SAND CLAY 0005 GREY SILT CLAY 0008 GREY SHLE 0026
MISSISSAUGA CITY	616760	4826156	2007/11 6032	1.97			NU	0004 10	7054194	BRWN SAND GRVL BRWN SILT GREY ROCK
MISSISSAUGA CITY	616760	4826157	2007/11 6032				NU		7054195	

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616681	4825819	2005/01 6607	2	25			0014 15	4909653	BRWN SAND GRVL 0002 BRWN SILT SNDY CLAY 0029
MISSISSAUGA CITY	616398	4825453	2006/05 7215	2				0005 5	4910190	
MISSISSAUGA CITY	616488	4825826	2006/09 6032	4.32 1.97			NU	0014 6	4910354	BRWN SAND GRVL CLAY 0004 GREY SHLE LMSN 0020
MISSISSAUGA CITY	616567	4825933	2008/11 7215				TH	0005 15	7116784	BRWN FILL DRY LOOS 0005 GREY SHLE DRY 0018 GREY SHLE WBRG 0020
MISSISSAUGA CITY	616301	4825668	2007/12 7241	1.25			MO		7104552	GREY SILT GRVL TILL 0007 GREY SHLE ROCK 0025
MISSISSAUGA CITY	616540	4825835	2008/07 7215				TH	0010 5	7116783	BRWN SAND SILT WBRG 0002 GREY SILT CLAY ROCK 0015
MISSISSAUGA CITY	616127	4825385	2007/12 7241	1.25			MO		7104550	BRWN GRVL SAND 0002 GREY SILT CLAY TILL 0008 GREY SHLE ROCK 0025
MISSISSAUGA CITY	616376	4825744	2007/12 7241	9.99		///:	MO		7104446	BRWN GRVL SAND FILL 0001 GREY SILT SAND GRVL 0007 GREY SHLE ROCK 0020
MISSISSAUGA CITY	616422	4825398	2008/08 6607	2	FR 0013 FR 0023		MO		7112537	BRWN SAND GRVL LOOS 0005 BRWN SILT GRVL DNSE 0013 RED SILT GRVL DNSE 0018 BRWN SILT GRVL HARD 0020 GREY CLAY SILT DNSE 0025 GREY SHLE LMSN LYRD 0027
MISSISSAUGA CITY	616584	4825812	2008/07 6607	2.31	FR 0013		OT		7112538	BRWN SILT STNS FILL 0007 GREY SHLE 0010 GREY LMSN 0022
MISSISSAUGA CITY	616706	4825925	2008/10 7241	1.59			MT	0008 10	7114795	BRWN SAND SOFT 0005 GREY SILT SHLE SOFT 0008 BLUE SHLE HARD 0018
MISSISSAUGA CITY	616481	4825981	2008/10 7241	1.17			MO		7114846	BRWN LOAM 0001 BRWN SILT CLAY GRVL 0009 GREY SHLE ROCK 0019
MISSISSAUGA CITY	616845	4826223	2008/05 7241	2.06			MT	0004 10	7116165	GREY TILL GRVL DNSE 0014
MISSISSAUGA CITY	616144	4824973	2012/09 7241	2.04			MT	0008 5	7189880	BRWN LOAM SAND LOOS 0002 BRWN SILT SAND HARD 0010 GREY SHLE WTHD 0013
MISSISSAUGA CITY	616622	4826203	2011/10 7238	2			TH	0020 10	7170553	BRWN FILL GRVL SOFT 0005 BRWN TILL CLAY HARD 0010 GREY SHLE CLAY HARD 0030
MISSISSAUGA CITY	616622	4826203	2011/10 7238	2			TH	0045 10	7170554	BRWN FILL GRVL HARD 0010 GREY SHLE CLAY HARD 0071
MISSISSAUGA CITY	616796	4826451	2011/09 7238	2			TH	0044 10	7170555	BRWN FILL GRVL HARD 0005 BRWN TILL CLAY HARD 0015 GREY SHLE HARD 0070

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616037	4825516	2011/11 7241	2.04			MT	0003 9	7173314	WHIT HARD 0001 BRWN SAND GRVL LOOS 0003 GREY SILT FSND SOFT 0010 BRWN SHLE SLTY 0118
MISSISSAUGA CITY	616030	4825504	2011/11 7241	2.04			MT	0003 9	7173315	BLCK SOFT 0000 BRWN SAND SILT LOOS 0010 BRWN SILT SHLE HARD 0012
MISSISSAUGA CITY	616049	4825488	2011/11 7241	2.04			MT	0007 3	7173316	BLCK SOFT 0000 BLUE SILT SAND SOFT 0010 BRWN SILT SHLE HARD 0010
MISSISSAUGA CITY	616774	4826287	2011/04 7215	2			TH	0006 7	7166952	BRWN FILL 0004 BRWN CLAY SLTY 0009 GREY CLAY SILT SHLE 0013
MISSISSAUGA CITY	616079	4824881	2012/09 7241	2.04			MT	0008 5	7189879	BRWN LOAM LOOS 0002 BRWN SILT SAND HARD 0010 GREY SHLE WTHD 0013
MISSISSAUGA CITY	615833	4825103	2011/05 7215	2			TH	0016 5	7164321	BRWN FILL 0007 GREY SHLE WBRG 0016
MISSISSAUGA CITY	616147	4824973	2012/09 7241	2.04			MT	0007 5	7189881	BRWN LOAM LOOS DRY 0002 BRWN SILT SAND GRVL 0006 BRWN SAND 0010 WHIT SHLE WTHD 0012
MISSISSAUGA CITY	616774	4826402	2012/08 7215	2			TH	0012 5	7191830	BRWN SAND SILT CLAY 0012
MISSISSAUGA CITY	616041	4825299	2012/09 6032	2			MO	0025 10	7196499	BLCK STNS HARD 0001 BRWN SILT CLAY HARD 0009 GREY SHLE CLAY HARD 0025
MISSISSAUGA CITY	616139	4825643	2013/05 6946						7203011	
MISSISSAUGA CITY	616145	4825621	2013/07 6946						7212112	
MISSISSAUGA CITY	616247	4825828	2014/06 7241	2			MT	0008 10	7224380	BRWN SILT SAND 0007 GREY SHLE 0018
MISSISSAUGA CITY	616234	4825824	2014/06 7241	2			MT	0008 10	7224382	BRWN SILT SAND 0007 GREY SHLE 0018
MISSISSAUGA CITY	616385	4825958	2012/07 7230						7189019	
MISSISSAUGA CITY	616371	4825524	2011/04 7238	1			MO	0040 10	7162446	BRWN CLAY TILL 0010 GREY SHLE ROCK 0050
MISSISSAUGA CITY	617167	4825940	2018/09 7230						7320262	
MISSISSAUGA CITY	616339	4825812	2010/11 6032	1.97			MO	0010 10	7155337	BRWN SAND SILT SHLE 0020 BRWN SAND SILT SHLE 0020
MISSISSAUGA CITY	616386	4825605	2010/11 7241	0.79			MT		7155811	GREY SILT CLAY DRY 0007 BRWN TILL SILT 0026 BRWN SHLE WTHD 0072
MISSISSAUGA CITY	616446	4825064	2010/11 6875				DE		7158865	
MISSISSAUGA CITY	616459	4825090	2010/11 6875				DE		7158866	
MISSISSAUGA CITY	615895	4825220	2011/01 7241	2					7159340	
MISSISSAUGA CITY	616754	4826114	2010/12 6032				MO		7160223	GREY SAND SILT TILL 0020
MISSISSAUGA CITY	616502	4825811	2010/08 6607	2.00 2.00			MO		7152202	BRWN SAND GRVL FILL 0001 BRWN CLAY SILT DNSE 0005 GREY SHLE LMSN LYRD 0020

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616440	4825397	2011/04 7238	1			MO	0040 10	7162447	BRWN CLAY SILT STNS 0015 GREY CLAY SILT STNS 0050
MISSISSAUGA CITY	616420	4825455	2011/04 7238	1			MO	0040 10	7162448	BRWN CLAY TILL 0010 GREY SHLE ROCK 0050
MISSISSAUGA CITY	616247	4825646	2011/04 7238	1			MO	0040 10	7162449	BRWN CLAY TILL 0010 GREY SHLE ROCK 0050
MISSISSAUGA CITY	616419	4825592	2011/05 7241	1.75			MT	0005 5	7164236	BLUE FILL SAND LOOS 0003 GREY SHLE TILL DNSE 0010
MISSISSAUGA CITY	616419	4825592	2011/05 7241	1.75			MT	0004 6	7164237	BRWN SAND LOOS 0003 GREY SHLE TILL DNSE 0010
MISSISSAUGA CITY	616419	4825592	2011/05 7241	1.75			MT	0004 5	7164238	BRWN SAND LOOS 0003 GREY SHLE TILL DNSE 0009
MISSISSAUGA CITY	616419	4825592	2011/05 7241	1.75			MT	0004 5	7164239	BRWN SAND FILL LOOS 0003 GREY SHLE TILL DNSE 0009
MISSISSAUGA CITY	616419	4825592	2011/05 7241	1.75			MO	0004 5	7164240	BRWN SAND FILL LOOS 0003 GREY SHLE TILL DNSE 0008
MISSISSAUGA CITY	615884	4825203	2011/01 7241	2			MT		7159341	
MISSISSAUGA CITY	616723	4825529	2020/03 7472						7364753	
MISSISSAUGA CITY	617114	4825985	2020/09 6875		8				7369235	
MISSISSAUGA CITY	616768	4825346	2020/03 7472						7364704	
MISSISSAUGA CITY	616795	4825327	2020/03 7472						7364705	
MISSISSAUGA CITY	616687	4825478	2020/03 7472						7364706	
MISSISSAUGA CITY	616630	4825420	2020/02 7472						7364707	
MISSISSAUGA CITY	616561	4825385	2020/02 7472						7364708	
MISSISSAUGA CITY	616864	4825306	2020/02 7472						7364750	
MISSISSAUGA CITY	616679	4825382	2020/03 7472						7364702	
MISSISSAUGA CITY	616715	4825374	2020/03 7472						7364752	
MISSISSAUGA CITY	616717	4825338	2020/02 7472						7364701	
MISSISSAUGA CITY	616933	4825302	2020/03 7472						7364754	
MISSISSAUGA CITY	616822	4825261	2020/02 7472						7364755	
MISSISSAUGA CITY	616988	4825823	2020/03 7472						7364756	
MISSISSAUGA CITY	616869	4825688	2020/03 7472						7364759	
MISSISSAUGA CITY	616987	4825868	2020/03 7472						7364760	
MISSISSAUGA CITY	617111	4825915	6875	5		///:	DE	0030 20	7354999	TILL CLAY GRVL 0020 GRVL BLDR WBRG 0025 GRVL SAND WBRG 0050
MISSISSAUGA CITY	616813	4825423	2020/03 7472						7364751	
MISSISSAUGA CITY	617142	4825920	6875	2		///:	DE	0045 5	7355003	TILL CLAY SAND 0010 GRVL BLDR 0024 TILL GRVL SAND 0040 SAND 0050
MISSISSAUGA CITY	616011	4825330	2018/11 7215						7325276	
MISSISSAUGA CITY	616791	4825239	2020/02 7238	2	UT 0003	///:	MO	0020 10	7355718	FILL 0005 SHLE ROCK 0030
MISSISSAUGA CITY	616725	4825438	2020/03 7472						7364703	
MISSISSAUGA CITY	616701	4826137	2020/10 7644						7373748	
MISSISSAUGA CITY	616569	4825664	2020/03 7464						7359499	
MISSISSAUGA CITY	617090	4826093	2020/06 7215						7362232	

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616376	4826453	2020/05 7472	2		///:	MO	0016 10	7363884	BRWN SAND SILT LOOS 0009 GREY CLAY TILL PCKD 0013 GREY SHLE WTHD 0018 GREY SHLE 0026
MISSISSAUGA CITY	616371	4826451	2020/05 7472	2		///:	MO	0005 10	7363885	BRWN FILL LOOS 0005 GREY SILT PCKD 0010 GREY TILL SILT PCKD 0015
MISSISSAUGA CITY	616599	4826239	2020/05 7472	2		///:	MO	0008 10	7363886	BRWN FILL LOOS 0005 BRWN SAND SILT LOOS 0015 BRWN SAND PCKD 0018
MISSISSAUGA CITY	616338	4826489	2020/05 7472	2		///:	MO	0011 10	7363889	BLCK LOOS 0002 BRWN SAND SILT LOOS 0010 GREY CLAY SILT PCKD 0015 GREY SHLE 0021
MISSISSAUGA CITY	615975	4826062	2020/04 7472						7364032	
MISSISSAUGA CITY	616668	4825315	2020/02 7472						7364700	
MISSISSAUGA CITY	617162	4825593	2020/03 7472						7364761	
MISSISSAUGA CITY	616596	4825371	2021/03 1663						7388901	
MISSISSAUGA CITY	616665	4825377	2021/03 1663						7388904	
MISSISSAUGA CITY	616663	4826097	2020/12 7644						7378968	
MISSISSAUGA CITY	616890	4826309	2020/10 7644						7373749	
MISSISSAUGA CITY	616929	4826366	2020/10 7644						7373750	
MISSISSAUGA CITY	616783	4826337	2020/10 7644						7373751	
MISSISSAUGA CITY	616122	4825131	2020/12 6607	2	UT 0012	///:	MO	0020 5	7376464	BRWN LOAM SAND SOFT 0001 BRWN SAND SILT DNSE 0005 GREY SILT CLAY HARD 0009 GREY SHLE SHLE LYRD 0025
MISSISSAUGA CITY	616122	4825107	2020/12 6607	2	UT 0012	///:	MO	0015 10	7376469	BRWN LOAM SAND SOFT 0001 BRWN SAND SILT DNSE 0005 GREY SILT CLAY HARD 0009 GREY SHLE SHLE LYRD 0025
MISSISSAUGA CITY	616121	4825108	2020/12 6607	2	UT 0012	///:	MO	0009 4	7376474	BRWN LOAM SAND SOFT 0001 BRWN SAND SILT DNSE 0005 GREY SILT CLAY HARD 0008 GREY SILT SHLE DNSE 0013
MISSISSAUGA CITY	616107	4825121	2020/12 6607	2	UT 0012	///:	MO	0025 10	7376476	BRWN LOAM SAND SOFT 0001 BRWN SAND SILT DNSE 0005 GREY SILT CLAY HARD 0009 GREY SHLE SHLE LYRD 0035
MISSISSAUGA CITY	616732	4826038	2020/12 7644						7378967	
MISSISSAUGA CITY	617131	4825897	6875	5		///:	DE	0033 22	7355020	TILL ---- BLDR 0038 GRVL SAND WBRG 0053
MISSISSAUGA CITY	616967	4825992	2020/12 7644						7378969	
MISSISSAUGA CITY	616854	4825189	2021/03 7644						7385466	
MISSISSAUGA CITY	616108	4825119	2020/12 6607	2	UT 0012	///:	MO	0004 4	7376482	BRWN LOAM SAND SOFT 0001 BRWN SAND SILT DNSE 0005 GREY SILT CLAY HARD 0008
MISSISSAUGA CITY	616575	4826051	2017/11 7383	2			MT	0020 5	7327960	TILL ROCK 0025

Table: MECP Water Wells Records (500 m Radius)

Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616570	4825514	2017/11 7383	2			MT	0047 3	7327961	TILL ROCK 0050
MISSISSAUGA CITY	616830	4825320	2018/08 7644	2			MT	0020 10	7327962	SILT CLAY 0030
MISSISSAUGA CITY	617053	4825715	2018/08 7644	2			TH MO	0020 10	7332457	SILT CLAY 0030 LMSN
MISSISSAUGA CITY	616691	4825290	2018/07 7644	2			TH MO	0025 10	7332458	SILT CLAY 0035 LMSN
MISSISSAUGA CITY	616636	4825337	2019/07 7644	2		///:	MT	0010 10	7342397	GREY CLAY SLTY 0020
MISSISSAUGA CITY	616678	4825534	2019/07 7644	2	UT 0024	///:	MT	0015 10	7342398	GREY CLAY SLTY 0020
MISSISSAUGA CITY	616055	4825500	2019/10 7147	1.97		///:	MO	0005 5	7346767	BRWN SAND SILT 0010 BRWN SHLE
MISSISSAUGA CITY	616868	4825444	2017/11 7383	2			MT	0018 10	7327957	TILL ROCK 0028
MISSISSAUGA CITY	616942	4825989	2019/08 7644	2		///:	MT	0015 10	7342478	TILL CLAY 0025
MISSISSAUGA CITY	617090	4825899	2019/08 7644	2		///:	MO	0027 10	7342479	BRWN FILL 0010 BRWN TILL SNDY 0025 GREY SILT SNDY 0037
MISSISSAUGA CITY	616784	4825167	2020/02 7238	2	UT 0005	///:	MO	0030 10	7355719	FILL 0007 SHLE ROCK 0040
MISSISSAUGA CITY	617091	4826115	6875	5		///:	DE MO	0025 20	7345293	GREY TILL CLAY GRVL 0017 BRWN SAND WBRG 0033 GREY GRVL STNS WBRG 0045
MISSISSAUGA CITY	617113	4825913	6875	5		///:	DE	0035 20	7354998	TILL CLAY GRVL 0008 GRVL ---- 0015 GRVL CLAY SAND 0032 GRVL SAND WBRG 0050 SAND WBRG 0055
MISSISSAUGA CITY	616042	4825513	2019/10 7147	1.97		///:	MO	0003 10	7346766	BRWN SAND SILT 0010 BRWN SHLE 0013
MISSISSAUGA CITY	616968	4825467	2017/11 7383	2			MT	0004 10	7327958	TILL ROCK 0014
MISSISSAUGA CITY	616821	4825313	2018/10 7644	2			MT	0005 10	7327951	
MISSISSAUGA CITY	616916	4825433	2018/10 7644	2			MT	0010 10	7327952	
MISSISSAUGA CITY	616730	4825339	2017/11 7683	2			MT	0018 10	7327953	TILL ROCK 0028
MISSISSAUGA CITY	616036	4825519	2019/10 7147	1.97		///:	MO	0003 10	7346765	BRWN SAND SILT 0010 BRWN SHLE 0013
MISSISSAUGA CITY	617018	4825702	2019/11 7644	2		///:	MT	0010 2	7353431	SILT 0012
MISSISSAUGA CITY	617082	4825598	2019/11 7644	2		///:	MT	0008 5	7353422	SILT 0013
MISSISSAUGA CITY	617050	4825828	2019/11 7644	2		///:	MT	0008 5	7353423	SILT 0013
MISSISSAUGA CITY	616029	4825507	2019/10 7147	1.97		///:	MO	0003 10	7346768	BRWN SAND SILT 0010 BRWN SHLE 0013
MISSISSAUGA CITY	617056	4825799	2019/11 7644	2		///:	MT	0010 5	7353425	SILT 0015
MISSISSAUGA CITY	616922	4826044	2019/08 7644	2		///:	MO	0030 10	7342480	BRWN FILL 0010 BRWN TILL SNDY 0025 GREY SILT SNDY 0040
MISSISSAUGA CITY	617115	4825733	2019/11 7644	2		///:	MT	0010 10	7353427	SILT SAND WBRG 0020
MISSISSAUGA CITY	617169	4825708	2019/11 7644	2		///:	MT	0010 28	7353428	SILT CLAY SAND 0038
MISSISSAUGA CITY	617054	4825855	2019/11 7644	2		///:	MT	0010 2	7353421	SILT 0012
MISSISSAUGA CITY	617072	4825698	2019/11 7644	2		///:	MT	0000 13	7353430	SILT 0013
MISSISSAUGA CITY	616976	4825824	2019/11 7644	2		///:	MT	0010 11	7353424	SILT CLAY 0021
MISSISSAUGA CITY	617041	4825687	2019/11 7644	2		///:	MT	0010 5	7353432	
MISSISSAUGA CITY	617128	4825899	6875	5		///:	DE	0030 20	7354991	TILL CLAY GRVL 0025 ---- SLTY 0035 GRVL SAND WBRG 0040 SAND GRVL WBRG 0050

Table: MECP Water Wells Records (500 m Radius)
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	617125	4825901	6875	5		///:	DE	0030 20	7354992	TILL CLAY GRVL 0020 ---- GRVL WBRG 0030 SAND GRVL WBRG 0046 GRVL WBRG 0050
MISSISSAUGA CITY	617123	4825902	6875	5		///:	DE	0035 20	7354993	TILL CLAY SAND 0018 GRVL CLAY SAND 0030 ---- SAND 0035 GRVL SAND ---- 0043 SAND GRVL 0050 GRVL 0055
MISSISSAUGA CITY	617121	4825904	6875	5		///:	DE	0030 20	7354994	TILL CLAY GRVL 0035 GRVL WBRG 0042 SAND GRVL WBRG 0050
MISSISSAUGA CITY	617199	4825906	6875	5		///:	DE	0030 20	7354995	TILL CLAY SAND 0035 GRVL WBRG 0042 SAND GRVL WBRG 0050
MISSISSAUGA CITY	617117	4825909	6875	5		///:	DE	0033 20	7354996	TILL GRVL CLAY 0008 GRVL BLDR 0015 SAND GRVL WBRG 0033 GRVL SAND WBRG 0042 SAND WBRG 0053
MISSISSAUGA CITY	617115	4825911	6875	5		///:	DE	0035 20	7354997	TILL CLAY GRVL 0008 GRVL BLDR 0015 GRVL SAND CLAY 0030 GRVL SAND WBRG 0050 SAND WBRG 0055
MISSISSAUGA CITY	617111	4825702	2019/11 7644	2		///:	MT	0010 11	7353429	SILT CLAY SAND 0021
MISSISSAUGA CITY	616401	4825654	2019/11 7641	2		///:	TH MO	0005 10	7350164	
MISSISSAUGA CITY	615911	4825222	2019/11 7241	2		///:	MT	0008 10	7348080	BRWN CLAY SILT 0009 GREY SHLE 0015 GREY SHLE 0018
MISSISSAUGA CITY	615898	4825217	2012/11 7241	2		///:	MT	0012 10	7348081	BRWN CLAY SILT 0009 GREY SHLE 0020 GREY SHLE 0022
MISSISSAUGA CITY	616654	4825613	2019/06 7644						7349530	
MISSISSAUGA CITY	616854	4825144	2018/06 7644						7349531	
MISSISSAUGA CITY	616993	4825786	7644	2		///:	MT	0010 2	7353426	SILT 0012
MISSISSAUGA CITY	616434	4825622	2019/11 7644	2		///:	MT	0005 5	7350163	CLAY TILL 0008 ROCK 0015
MISSISSAUGA CITY	617111	4825829	2019/11 7644	1.87		///:	MO	0010 5	7353420	SILT CLAY SAND 0015
MISSISSAUGA CITY	616245	4825472	2019/11 7644	2	UT 0010	///:	MT	0005 10	7350165	BRWN FILL SAND GRVL 0001 GREY TILL SILT HARD 0010 GREY SHLE HARD 0015
MISSISSAUGA CITY	616282	4825423	2019/11 7644	2	UT 0010	///:	MT	0005 10	7350166	BRWN LOAM SOFT 0000 GREY SILT TILL HARD 0010 GREY SHLE HARD 0015
MISSISSAUGA CITY	616398	4825576	2019/11 7644	2	UT 0010	///:	MT	0005 10	7350168	BLCK ---- HARD 0000 GREY TILL SHLE HARD 0015
MISSISSAUGA CITY	616376	4825676	2019/11 7644	2	UT 0010	///:	MT	0005 10	7350169	BLCK ---- HARD 0000 GREY TILL SHLE HARD 0015
MISSISSAUGA CITY	616067	4825431	2019/11 7644	2	UT 0010	///:	MT	0005 10	7350170	BLCK ---- HARD 0000 GREY TILL HARD 0015
MISSISSAUGA CITY	616411	4825633	2019/11 7644	2	UT 0010	///:	MT	0005 10	7350167	BRWN FILL GRVL SAND 0005 GREY TILL SHLE HARD 0015
MISSISSAUGA CITY	616454	4825636	2019/11 7644	2		///:	MT	0010 10	7350162	CLAY TILL 0020
MISSISSAUGA CITY	617104	4825565	2019/11 7644	2		///:	MT	0010 5	7353417	SILT 0015

Table: MECP Water Wells Records (500 m Radius)

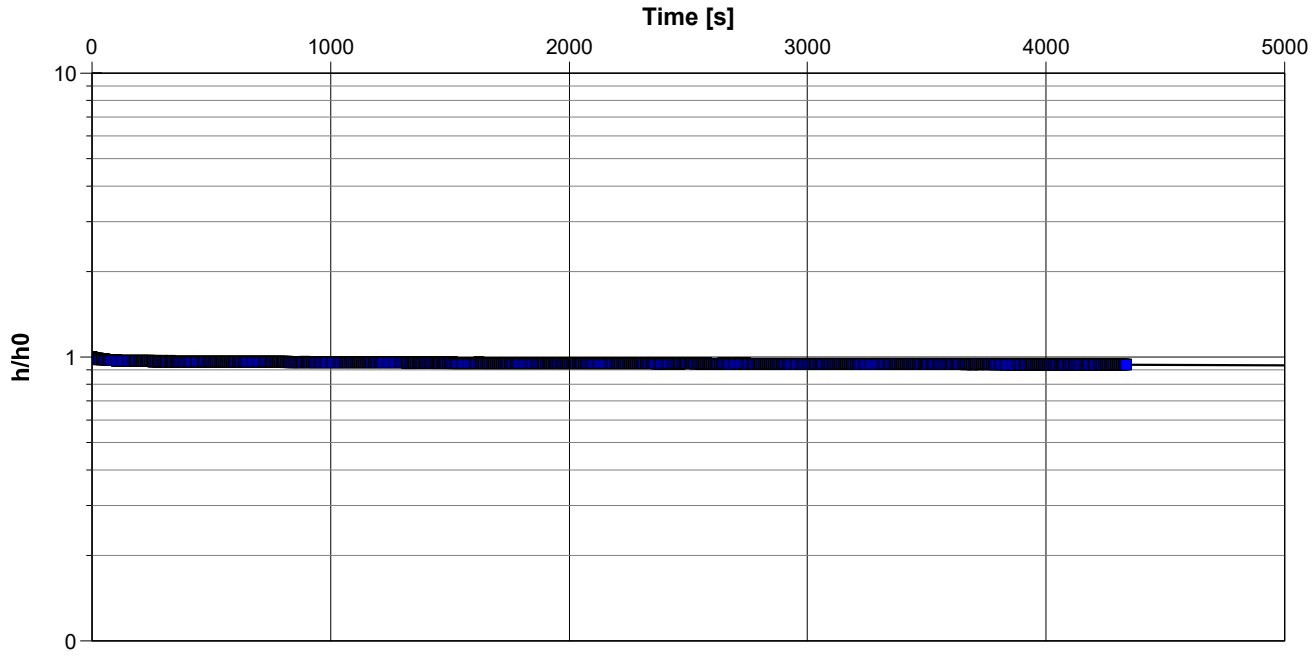
Location: Rangview Road, Mississauga

MISSISSAUGA CITY	616911	4825805	2019/11 7644	2		///:	MT	0010 3	7353416	SILT 0013
MISSISSAUGA CITY (PO	616376	4825397	2007/08 6607	1.99		///:	MO		7050861	BRWN SAND GRVL 0005 GREY SHLE SOFT 0010 GREY SHLE 0020
MISSISSAUGA CITY DS S 03	616508	4825833	2002/02 7147					0001 5	4908971	BRWN LOAM 0001 BRWN CLAY 0006 GREY SHLE ROCK 0006
MISSISSAUGA CITY DS S 03	616522	4825880	2002/02 7147					0001 5	4908970	BRWN LOAM 0001 BRWN CLAY 0006 GREY SHLE ROCK 0006
MISSISSAUGA CITY DS S 03	616482	4825852	2002/02 7147					0003 5	4908972	BRWN LOAM 0001 BRWN CLAY 0008 GREY SHLE ROCK 0008
MISSISSAUGA CITY DS S 03	616446	4825874	2002/02 7147					0001 5	4908969	BRWN LOAM 0001 BRWN CLAY 0006 GREY SHLE ROCK 0006
MISSISSAUGA CITY DS S 03 008	616490	4825589	1967/04 3512	8	FR 0070	30/35/135/:	IN	0072 10	4902286	BRWN CLAY MSND 0020 BLUE CLAY GRVL 0062 BLUE CLAY 0070 MSND GRVL 0082
TORONTO CITY	616386	4825426	2007/08 7241	1.5				0010 9	7049725	RED FILL SAND SOFT 0003 BRWN SILT CLAY DNSE 0017 BRWN SILT CLAY 0019

Appendix C: Hydraulic Conductivity Analysis

Slug Test Analysis Report	
Project: Hydrogeology Investigation	
Number: 22-200-100	
Client: Rangeview Estates	

Location: Mississauga, ON	Slug Test: MW/BH 22-6	Test Well: MW/BH 22-6
Test Conducted by: AQ		Test Date: 10/18/2022
Analysis Performed by: PP	Hvorslev	Analysis Date: 10/18/2022
Aquifer Thickness: 1.31 m		

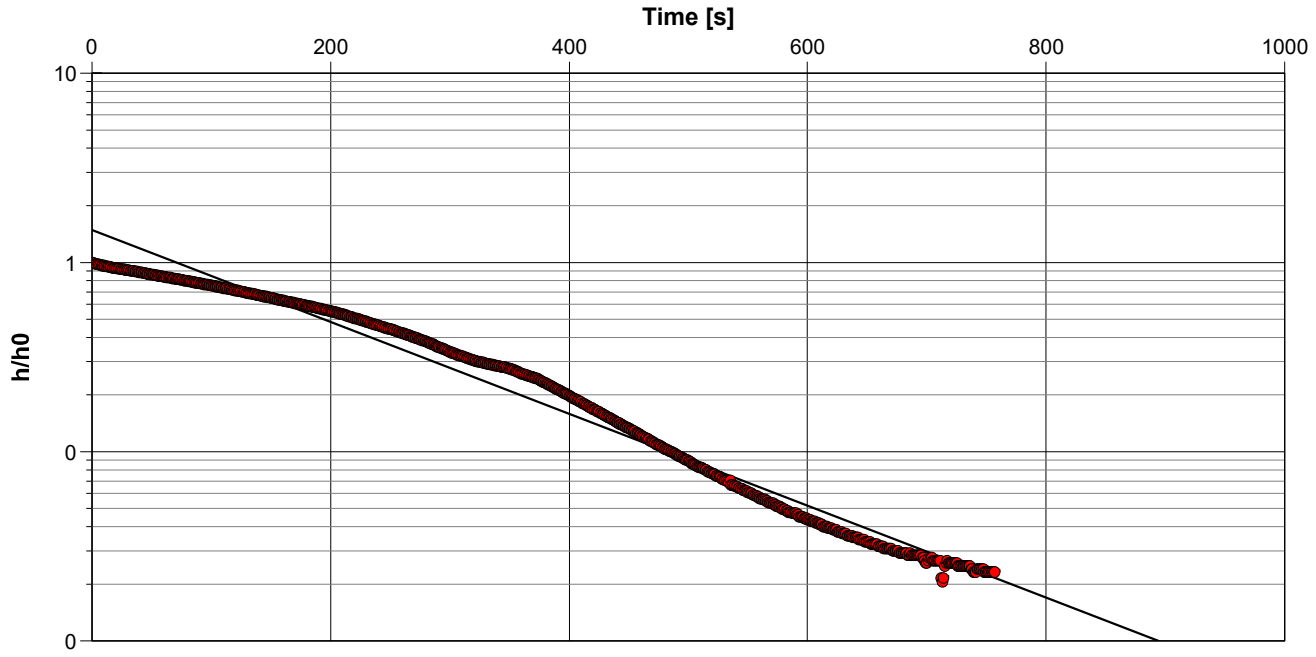


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW/BH 22-6	5.28×10^{-9}	

	Slug Test Analysis Report
	Project: Hydrogeology Investigation
	Number: 22-200-100
	Client: Rangeview Estates

Location: Mississauga, ON	Slug Test: MW/BH 22-9	Test Well: MW/BH 22-9
Test Conducted by:		Test Date: 10/18/2022
Analysis Performed by: PP	Hvorslev	Analysis Date: 10/18/2022
Aquifer Thickness: 3.11 m		

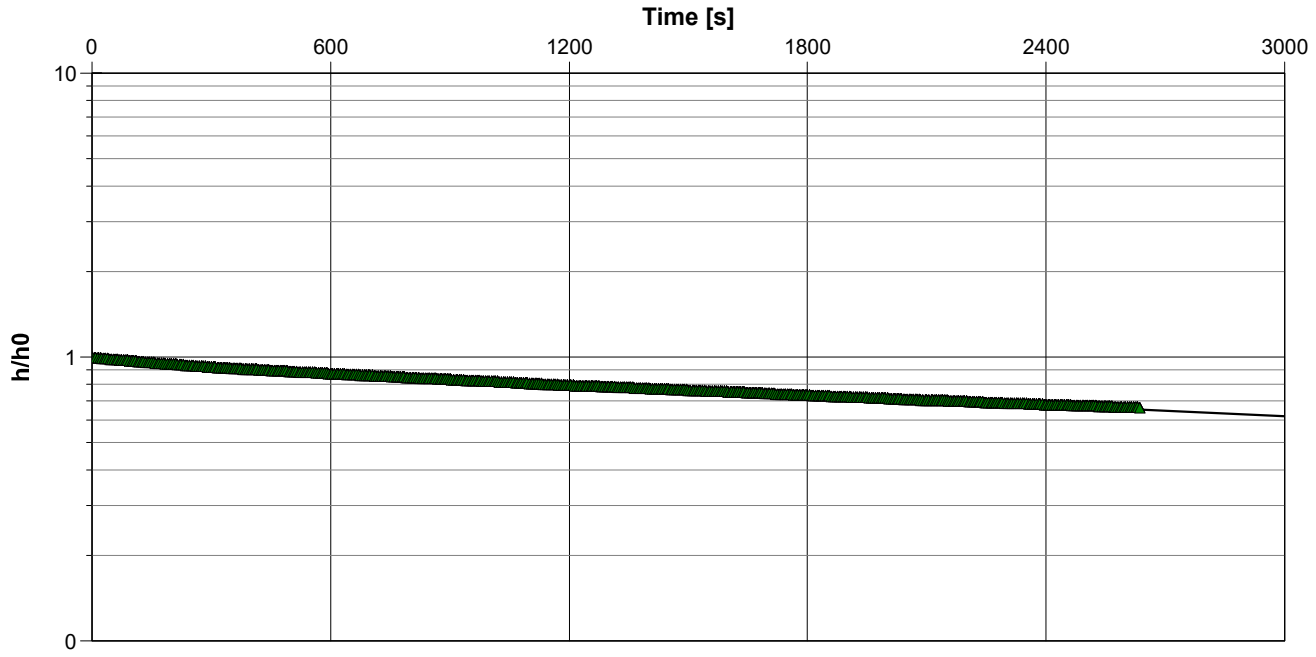


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW/BH 22-9	2.52×10^{-6}	

	Slug Test Analysis Report
	Project: Hydrogeology Investigation
	Number: 22-200-100
	Client: Rangeview Estates

Location: Mississauga, ON	Slug Test: MW/BH 22-13	Test Well: MW/BH 22-13
Test Conducted by: PP		Test Date: 10/18/2022
Analysis Performed by: PP	Hvorslev	Analysis Date: 10/18/2022
Aquifer Thickness: 2.21 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MW/BH 22-13	1.11×10^{-7}	

Appendix D: Groundwater Quality Certificate of Analysis





FINAL REPORT

CA14622-SEP22 R1

22-200-100, 974 Lakeshore Rd E, Mississauga

Prepared for

DS Consultants

FINAL REPORT

CA14622-SEP22 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	DS Consultants	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	6221 Highway 7 Unit 6 Vaughan, Ontario L4H 0K8. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Abdul Qadir	Telephone	705-652-2000
Telephone	204-951-8164	Facsimile	705-652-6365
Facsimile	905-264-2685	Email	Maarit.Wolfe@sgs.com
Email	abdul.qadir@dsconsultants.ca; don.hsu@dsconsultants.ca	SGS Reference	CA14622-SEP22
Project	22-200-100, 974 Lakeshore Rd E, Mississauga	Received	09/23/2022
Order Number		Approved	10/05/2022
Samples	Ground Water (2)	Report Number	CA14622-SEP22 R1
		Date Reported	10/05/2022

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 8 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 033384

Metals limits raised 10x due to sample matrix

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

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Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer - BL_0046_2022

			Sample Number	8	9	
			Sample Name	BH22-9	BH22-9	
					03-Oct-22	
			Sample Matrix	Ground Water	Ground Water	
			Sample Date	22/09/2022	03/10/2022	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	
General Chemistry						
Biochemical Oxygen Demand (BOD5)	mg/L	2	15	< 4 ↑	---	
Total Suspended Solids	mg/L	2	15	9560	---	
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	---	
Metals and Inorganics						
Total Chlorine	mg/L	0.02	1	< 0.02	---	
Fluoride	mg/L	0.06		0.18	---	
Cyanide (total)	mg/L	0.01	0.02	< 0.01	---	
Sulphate	mg/L	2		98	---	
Aluminum (0.2µm)	mg/L	0.001		0.211	---	
Aluminum (total)	mg/L	0.01	1	63.5	---	
Antimony (total)	mg/L	0.009		< 0.009	---	
Arsenic (total)	mg/L	0.002	0.02	0.038	---	
Cadmium (total)	mg/L	0.00003	0.008	0.00012	---	
Chromium (total)	mg/L	0.0008	0.08	0.117	---	
Copper (total)	mg/L	0.002	0.04	0.129	---	
Cobalt (total)	mg/L	0.00004		0.0661	---	
Lead (total)	mg/L	0.0009	0.12	0.0362	---	
Manganese (total)	mg/L	0.0001	2	5.44	---	
Molybdenum (total)	mg/L	0.0004		0.0033	---	
Nickel (total)	mg/L	0.001	0.08	0.135	---	
Phosphorus (total)	mg/L	0.03	0.4	3.76	---	

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer - BL_0046_2022

			Sample Number	8	9	
			Sample Name	BH22-9	BH22-9	
					03-Oct-22	
			Sample Matrix	Ground Water	Ground Water	
			Sample Date	22/09/2022	03/10/2022	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	
Metals and Inorganics (continued)						
Selenium (total)	mg/L	0.0004	0.02	0.0006	---	
Silver (total)	mg/L	0.0005	0.12	< 0.0005	---	
Tin (total)	mg/L	0.0006		0.0016	---	
Titanium (total)	mg/L	0.0005		0.190	---	
Zinc (total)	mg/L	0.02	0.2	**0.37**	---	
Microbiology						
E. Coli	cfu/100mL	0	200	---	0	
Nonylphenol and Ethoxylates						
Nonylphenol	mg/L	0.001		< 0.001	---	
Nonylphenol Ethoxylates	mg/L	0.01		< 0.01	---	
Nonylphenol diethoxylate	mg/L	0.01		< 0.01	---	
Nonylphenol monoethoxylate	mg/L	0.01		< 0.01	---	
Oil and Grease						
Oil & Grease (total)	mg/L	2		< 2	---	
Oil & Grease (animal/vegetable)	mg/L	4		< 4	---	
Oil & Grease (mineral/synthetic)	mg/L	4		< 4	---	

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer - BL_0046_2022

	Sample Number			8	9
	Sample Name			BH22-9	BH22-9
					03-Oct-22
	Sample Matrix			Ground Water	Ground Water
	Sample Date			22/09/2022	03/10/2022
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
Other (ORP)					
pH	No unit	0.05	9	7.13	---
Chromium VI	mg/L	0.0002	0.04	< 0.0002	---
Mercury (total)	mg/L	0.00001	0.0004	0.00001	---
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001		< 0.0001	---
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	µg/L	0.04	0.4	< 0.04	---
Phenols					
4AAP-Phenolics	mg/L	0.002	0.008	< 0.002	---
SVOCs					
di-n-Butyl Phthalate	mg/L	0.002		< 0.002	---
Bis(2-ethylhexyl)phthalate	mg/L	0.002		< 0.002	---
PAHs (Total)	mg/L		0.002	< 0.001	---
Perylene	mg/L	0.0005		< 0.0005	---

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer - BL_0046_2022

Sample Number	8	9
Sample Name	BH22-9	BH22-9
		03-Oct-22
Sample Matrix	Ground Water	Ground Water
Sample Date	22/09/2022	03/10/2022

Parameter	Units	RL	L1	Result	Result
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001		< 0.0001	---
Anthracene	mg/L	0.0001		< 0.0001	---
Benzo(a)anthracene	mg/L	0.0001		< 0.0001	---
Benzo(a)pyrene	mg/L	0.0001		< 0.0001	---
Benzo(e)pyrene	mg/L	0.0001		< 0.0001	---
Benzo(ghi)perylene	mg/L	0.0002		< 0.0002	---
Benzo(k)fluoranthene	mg/L	0.0001		< 0.0001	---
Chrysene	mg/L	0.0001		< 0.0001	---
Dibenzo(a,h)anthracene	mg/L	0.0001		< 0.0001	---
Dibenzo(a,i)pyrene	mg/L	0.0001		< 0.0001	---
Dibenzo(a,j)acridine	mg/L	0.0001		< 0.0001	---
Fluoranthene	mg/L	0.0001		< 0.0001	---
Indeno(1,2,3-cd)pyrene	mg/L	0.0002		< 0.0002	---
Phenanthrene	mg/L	0.0001		< 0.0001	---
Pyrene	mg/L	0.0001		< 0.0001	---

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer - BL_0046_2022

Sample Number	8	9
Sample Name	BH22-9	BH22-9
		03-Oct-22
Sample Matrix	Ground Water	Ground Water
Sample Date	22/09/2022	03/10/2022

Parameter	Units	RL	L1	Result	Result
VOCs					
Chloroform	mg/L	0.0005		< 0.0005	---
1,2-Dichlorobenzene	mg/L	0.0005	0.0056	< 0.0005	---
1,4-Dichlorobenzene	mg/L	0.0005	0.0068	< 0.0005	---
cis-1,2-Dichloroethene	mg/L	0.0005		0.0115	---
trans-1,3-Dichloropropene	mg/L	0.0005		< 0.0005	---
Methylene Chloride	mg/L	0.0005		< 0.0005	---
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.017	< 0.0005	---
1,1,1,2-Tetrachloroethane	mg/L	0.0005	0.017	< 0.0005	---
Methyl ethyl ketone	mg/L	0.02		< 0.02	---
Styrene	mg/L	0.0005		< 0.0005	---
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.0044	< 0.0005	---
Trichloroethylene	mg/L	0.0005	0.0076	0.0029	---
VOCs - BTEX					
Benzene	mg/L	0.0005	0.002	< 0.0005	---
Ethylbenzene	mg/L	0.0005	0.002	< 0.0005	---
Toluene	mg/L	0.0005	0.002	< 0.0005	---
Xylene (total)	mg/L	0.0005	0.0044	< 0.0005	---
m-p-xylene	mg/L	0.0005		< 0.0005	---
o-xylene	mg/L	0.0005		< 0.0005	---

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer - BL_0046_2022 L1
BH22-9				
Total Suspended Solids	SM 2540D	mg/L	9560	15
Aluminum	SM 3030/EPA 200.8	mg/L	63.5	1
Arsenic	SM 3030/EPA 200.8	mg/L	0.038	0.02
Chromium	SM 3030/EPA 200.8	mg/L	0.117	0.08
Copper	SM 3030/EPA 200.8	mg/L	0.129	0.04
Manganese	SM 3030/EPA 200.8	mg/L	5.44	2
Nickel	SM 3030/EPA 200.8	mg/L	0.135	0.08
Phosphorus	SM 3030/EPA 200.8	mg/L	3.76	0.4
Zinc	SM 3030/EPA 200.8	mg/L	0.37	0.2

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO5058-SEP22	mg/L	2	<2	9	20	111	80	120	91	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0050-SEP22	mg/L	2	< 2	15	30	102	70	130	82	70	130

Chlorine

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Chlorine	EWL0494-SEP22	mg/L	0.02	< 0.02	ND	20	99	90	110	NA		

QC SUMMARY

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0220-SEP22	mg/L	0.01	<0.01	ND	10	95	90	110	NV	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0495-SEP22	mg/L	0.06	<0.06	5	10	100	90	110	110	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0234-SEP22	mg/L	0.0002	<0.0002	ND	20	100	80	120	92	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0052-SEP22	mg/L	0.00001	< 0.00001	11	20	118	80	120	102	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0238-SEP22	mg/L	0.0005	<0.00005	ND	20	103	90	110	71	70	130
Aluminum (total)	EMS0238-SEP22	mg/L	0.01	<0.001	2	20	93	90	110	89	70	130
Arsenic (total)	EMS0238-SEP22	mg/L	0.002	<0.0002	6	20	106	90	110	103	70	130
Cadmium (total)	EMS0238-SEP22	mg/L	0.00003	<0.000003	20	20	103	90	110	91	70	130
Cobalt (total)	EMS0238-SEP22	mg/L	0.00004	<0.000004	7	20	104	90	110	102	70	130
Chromium (total)	EMS0238-SEP22	mg/L	0.0008	<0.00008	11	20	100	90	110	109	70	130
Copper (total)	EMS0238-SEP22	mg/L	0.002	<0.0002	14	20	100	90	110	91	70	130
Manganese (total)	EMS0238-SEP22	mg/L	0.0001	<0.00001	2	20	107	90	110	97	70	130
Molybdenum (total)	EMS0238-SEP22	mg/L	0.0004	<0.00004	7	20	94	90	110	100	70	130
Nickel (total)	EMS0238-SEP22	mg/L	0.001	<0.0001	0	20	100	90	110	92	70	130
Lead (total)	EMS0238-SEP22	mg/L	0.0009	<0.00001	14	20	94	90	110	89	70	130
Phosphorus (total)	EMS0238-SEP22	mg/L	0.03	<0.003	9	20	96	90	110	NV	70	130
Antimony (total)	EMS0238-SEP22	mg/L	0.009	<0.0009	ND	20	95	90	110	101	70	130
Selenium (total)	EMS0238-SEP22	mg/L	0.0004	<0.00004	7	20	101	90	110	95	70	130
Tin (total)	EMS0238-SEP22	mg/L	0.0006	<0.00006	ND	20	97	90	110	NV	70	130
Titanium (total)	EMS0238-SEP22	mg/L	0.0005	<0.00005	2	20	97	90	110	NV	70	130
Zinc (total)	EMS0238-SEP22	mg/L	0.02	<0.002	4	20	103	90	110	80	70	130
Aluminum (0.2µm)	EMS0242-SEP22	mg/L	0.001	<0.001	2	20	101	90	110	75	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9013-OCT22	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0393-SEP22	mg/L	0.01	<0.01			88	55	120			
Nonylphenol Ethoxylates	GCM0393-SEP22	mg/L	0.01	< 0.01								
Nonylphenol monoethoxylate	GCM0393-SEP22	mg/L	0.01	<0.01			90	55	120			
Nonylphenol	GCM0393-SEP22	mg/L	0.001	<0.001			91	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0482-SEP22	mg/L	2	<2	NSS	20	105	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0482-SEP22	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0482-SEP22	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0496-SEP22	No unit	0.05	NA	1		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0228-SEP22	mg/L	0.002	<0.002	ND	10	105	80	120	102	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0452-SEP22	ug/L	0.04	< 0.04	NSS	30	100	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
7Hdibenzo(c,g)carbazole	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Anthracene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	104	50	140	NSS	50	140
Benzo(a)anthracene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	100	50	140	NSS	50	140
Benzo(a)pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	103	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	99	50	140	NSS	50	140
Benzo(e)pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	98	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0499-SEP22	mg/L	0.0002	< 0.0002	NSS	30	99	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	102	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0499-SEP22	mg/L	0.002	< 0.002	NSS	30	137	50	140	NSS	50	140
Chrysene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	105	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0499-SEP22	mg/L	0.002	< 0.002	NSS	30	132	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	104	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	75	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	88	50	140	NSS	50	140
Fluoranthene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	109	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0499-SEP22	mg/L	0.0002	< 0.0002	NSS	30	109	50	140	NSS	50	140
Perylene	GCM0499-SEP22	mg/L	0.0005	< 0.0005	NSS	30	101	50	140	NSS	50	140
Phenanthrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	106	50	140	NSS	50	140
Pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	101	50	140	NSS	50	140

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0493-SEP22	mg/L	2	< 2	0	10	101	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0230-SEP22	as N mg/L	0.5	<0.5	1	10	103	90	110	108	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	95	60	130	99	50	140
1,1,2,2-Tetrachloroethane	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	95	60	130	97	50	140
1,2-Dichlorobenzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	99	50	140
1,4-Dichlorobenzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	97	50	140
Benzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	95	60	130	99	50	140
Chloroform	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	94	60	130	98	50	140
cis-1,2-Dichloroethene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	101	50	140
Ethylbenzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	101	50	140
m-p-xylene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	99	50	140
Methyl ethyl ketone	GCM0420-SEP22	mg/L	0.02	<0.02	ND	30	91	50	140	98	50	140
Methylene Chloride	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	99	50	140
o-xylene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	99	60	130	103	50	140
Styrene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	100	50	140
Tetrachloroethylene (perchloroethylene)	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	98	60	130	101	50	140
Toluene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	99	50	140
trans-1,3-Dichloropropene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	99	60	130	103	50	140
Trichloroethylene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	98	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.
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This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 033384
Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Sofia
Received Date: 09/23/2022 (mm/dd/yy)
Received Time: 11:30 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☐ No ☐ Type: Ice
Temperature Upon Receipt (°C): 2 & 3
LAB LIMS #: CAL1622-Sep22

REPORT INFORMATION

Company: Accounting
Contact: Abdul Qadir
Address: 6221 Hwy 7, Unit 16, Vaughan ON
Phone: 204-951-8164
Fax:
Email: abdul.qadir@dsconsultants.ca

INVOICE INFORMATION

☑ (same as Report Information)
Company: Accounting
Contact:
Address:
Phone:
Email:

Quotation #:
P.O. #:
Project #: 22-200-100
Site Location/ID: 974 Lakeshore Rd E, Mississauga

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends).
Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:
☒ Sanitary
☒ Storm
Municipality: Peel / Mississauga

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Ti,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other (please specify)					Other: Sewer Use: Peel/Mississauga (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	SPLP: Specify tests (☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN)	TCLP: Specify tests (☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	BH22-9	22/Sep/2022	PM	20	GW	N															✓				Non filtered
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Abdul Qadir Signature:
Relinquished by (NAME): Abdul Qadir Signature:
Date: 09/23/22 (mm/dd/yy)
Date: 09/23/22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.5
Date of Issue: 02 May 2022

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 029536 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Nicole Briganz
Received Date: 10 / 05 / 22 (mm/dd/yy)
Received Time: 11 : 30 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: Ice packs
Temperature Upon Receipt (°C) 9.9.9
LAB LIMS #: CA-14622-SEP22

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☒ (same as Report Information)
Contact: Abdul Qadir	Company: Accounting
Address: 6221 Hwy 7, Unit 16, Vaughan, ON	Contact:
Phone: 204-951-8164	Address:
Fax:	Phone:
Email: abdul.qadir@dsconsultants.ca	Email:

Quotation #:
P.O. #:
Project #: 22-200-100
Site Location/ID: 974 Lakeshore Rd E, Mississauga

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☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:
☒ Sanitary
☒ Storm
Municipality: Peel Region/ Mississauga

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

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	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other (please specify)	Other	Other	Other	Other: Sewer Use: Peel Region / Specify pkg: Mississauga	Other: Water Characterization Pkg General ☐ Extended ☐	SPLP: Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	TCLP: Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	BH22-9	03/oct/2022	Am	1	GW	N															✓				CA14622 Append
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Abdul Qadir Signature: Date: 10 / 03 / 22 (mm/dd/yy)
Relinquished by (NAME): Abdul Qadir Signature: Date: 10 / 03 / 22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

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FINAL REPORT

CA14622-SEP22 R1

22-200-100, 974 Lakeshore Rd E, Mississauga

Prepared for

DS Consultants

FINAL REPORT

CA14622-SEP22 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	DS Consultants	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	6221 Highway 7 Unit 6 Vaughan, Ontario L4H 0K8. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Abdul Qadir	Telephone	705-652-2000
Telephone	204-951-8164	Facsimile	705-652-6365
Facsimile	905-264-2685	Email	Maarit.Wolfe@sgs.com
Email	abdul.qadir@dsconsultants.ca; don.hsu@dsconsultants.ca	SGS Reference	CA14622-SEP22
Project	22-200-100, 974 Lakeshore Rd E, Mississauga	Received	09/23/2022
Order Number		Approved	10/05/2022
Samples	Ground Water (2)	Report Number	CA14622-SEP22 R1
		Date Reported	10/05/2022

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 8 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 033384

Metals limits raised 10x due to sample matrix

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

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Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Table 1 - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Table 2 - Storm Sewer Discharge - BL_53_2010

					Sample Number	8	9
					Sample Name	BH22-9	BH22-9
							03-Oct-22
					Sample Matrix	Ground Water	Ground Water
					Sample Date	22/09/2022	03/10/2022
Parameter		**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
General Chemistry							
Biochemical Oxygen Demand (BOD5)		mg/L	2	300	15	< 4 ↑	---
Total Suspended Solids		mg/L	2	350	15	9560	---
Total Kjeldahl Nitrogen	as N	mg/L	0.5	100	1	< 0.5	---
Metals and Inorganics							
Total Chlorine		mg/L	0.02			< 0.02	---
Fluoride		mg/L	0.06	10		0.18	---
Cyanide (total)		mg/L	0.01	2	0.02	< 0.01	---
Sulphate		mg/L	2	1500		98	---
Aluminum (0.2µm)		mg/L	0.001			0.211	---
Aluminum (total)		mg/L	0.01	50		63.5	---
Antimony (total)		mg/L	0.009	5		< 0.009	---
Arsenic (total)		mg/L	0.002	1	0.02	0.038	---
Cadmium (total)		mg/L	0.00003	0.7	0.008	0.00012	---
Chromium (total)		mg/L	0.0008	5	0.08	0.117	---
Copper (total)		mg/L	0.002	3	0.05	0.129	---
Cobalt (total)		mg/L	0.00004	5		0.0661	---
Lead (total)		mg/L	0.0009	3	0.12	0.0362	---
Manganese (total)		mg/L	0.0001	5	0.05	5.44	---
Molybdenum (total)		mg/L	0.0004	5		0.0033	---
Nickel (total)		mg/L	0.001	3	0.08	0.135	---
Phosphorus (total)		mg/L	0.03	10	0.4	3.76	---

Client: DS Consultants
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MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Table 1 - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Table 2 - Storm Sewer Discharge - BL_53_2010

				Sample Number	8	9
				Sample Name	BH22-9	BH22-9
						03-Oct-22
				Sample Matrix	Ground Water	Ground Water
				Sample Date	22/09/2022	03/10/2022
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
Metals and Inorganics (continued)						
Selenium (total)	mg/L	0.0004	1	0.02	0.0006	---
Silver (total)	mg/L	0.0005	5	0.12	< 0.0005	---
Tin (total)	mg/L	0.0006	5		0.0016	---
Titanium (total)	mg/L	0.0005	5		0.190	---
Zinc (total)	mg/L	0.02	3	0.04	**0.37**	---
Microbiology						
E. Coli	cfu/100mL	0		200	---	0
Nonylphenol and Ethoxylates						
Nonylphenol	mg/L	0.001	0.02		< 0.001	---
Nonylphenol Ethoxylates	mg/L	0.01	0.2		< 0.01	---
Nonylphenol diethoxylate	mg/L	0.01			< 0.01	---
Nonylphenol monoethoxylate	mg/L	0.01			< 0.01	---
Oil and Grease						
Oil & Grease (total)	mg/L	2			< 2	---
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4	---
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4	---

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
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MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Table 1 - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Table 2 - Storm Sewer Discharge - BL_53_2010

				Sample Number	8	9
				Sample Name	BH22-9	BH22-9
						03-Oct-22
				Sample Matrix	Ground Water	Ground Water
				Sample Date	22/09/2022	03/10/2022
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
Other (ORP)						
pH	No unit	0.05	10	9	7.13	---
Chromium VI	mg/L	0.0002			< 0.0002	---
Mercury (total)	mg/L	0.00001	0.01	0.0004	0.00001	---
PAHs						
Benzo(b+j)fluoranthene	mg/L	0.0001			< 0.0001	---
PCBs						
Polychlorinated Biphenyls (PCBs) - Total	µg/L	0.04	1	0.4	< 0.04	---
Phenols						
4AAP-Phenolics	mg/L	0.002	1	0.008	< 0.002	---
SVOCs						
di-n-Butyl Phthalate	mg/L	0.002	0.08	0.015	< 0.002	---
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.012	0.0088	< 0.002	---
PAHs (Total)	mg/L				< 0.001	---
Perylene	mg/L	0.0005			< 0.0005	---

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Table 1 - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Table 2 - Storm Sewer Discharge - BL_53_2010

				Sample Number	8	9
				Sample Name	BH22-9	BH22-9
						03-Oct-22
				Sample Matrix	Ground Water	Ground Water
				Sample Date	22/09/2022	03/10/2022
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
SVOCs - PAHs						
7Hdibenzo(c,g)carbazole	mg/L	0.0001			< 0.0001	---
Anthracene	mg/L	0.0001			< 0.0001	---
Benzo(a)anthracene	mg/L	0.0001			< 0.0001	---
Benzo(a)pyrene	mg/L	0.0001			< 0.0001	---
Benzo(e)pyrene	mg/L	0.0001			< 0.0001	---
Benzo(ghi)perylene	mg/L	0.0002			< 0.0002	---
Benzo(k)fluoranthene	mg/L	0.0001			< 0.0001	---
Chrysene	mg/L	0.0001			< 0.0001	---
Dibenzo(a,h)anthracene	mg/L	0.0001			< 0.0001	---
Dibenzo(a,i)pyrene	mg/L	0.0001			< 0.0001	---
Dibenzo(a,j)acridine	mg/L	0.0001			< 0.0001	---
Fluoranthene	mg/L	0.0001			< 0.0001	---
Indeno(1,2,3-cd)pyrene	mg/L	0.0002			< 0.0002	---
Phenanthrene	mg/L	0.0001			< 0.0001	---
Pyrene	mg/L	0.0001			< 0.0001	---

Client: DS Consultants
Project: 22-200-100, 974 Lakeshore Rd E, Mississauga
Project Manager: Abdul Qadir
Samplers: Abdul Qadir

MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Table 1 - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Table 2 - Storm Sewer Discharge - BL_53_2010

				Sample Number	8	9
				Sample Name	BH22-9	BH22-9
						03-Oct-22
				Sample Matrix	Ground Water	Ground Water
				Sample Date	22/09/2022	03/10/2022
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
VOCs						
Chloroform	mg/L	0.0005	0.04	0.002	< 0.0005	---
1,2-Dichlorobenzene	mg/L	0.0005	0.05	0.0056	< 0.0005	---
1,4-Dichlorobenzene	mg/L	0.0005	0.08	0.0068	< 0.0005	---
cis-1,2-Dichloroethene	mg/L	0.0005	4	0.0056	0.0115	---
trans-1,3-Dichloropropene	mg/L	0.0005	0.14	0.0056	< 0.0005	---
Methylene Chloride	mg/L	0.0005	2	0.0052	< 0.0005	---
1,1,2,2-Tetrachloroethane	mg/L	0.0005	1.4	0.017	< 0.0005	---
1,1,1,2-Tetrachloroethane	mg/L	0.0005			< 0.0005	---
Methyl ethyl ketone	mg/L	0.02	8		< 0.02	---
Styrene	mg/L	0.0005	0.2		< 0.0005	---
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1	0.0044	< 0.0005	---
Trichloroethylene	mg/L	0.0005	0.4	0.008	0.0029	---
VOCs - BTEX						
Benzene	mg/L	0.0005	0.01	0.002	< 0.0005	---
Ethylbenzene	mg/L	0.0005	0.16	0.002	< 0.0005	---
Toluene	mg/L	0.0005	0.27	0.002	< 0.0005	---
Xylene (total)	mg/L	0.0005	1.4	0.0044	< 0.0005	---
m-p-xylene	mg/L	0.0005			< 0.0005	---
o-xylene	mg/L	0.0005			< 0.0005	---

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Peel Table 1 - Sanitary Sewer Discharge - BL_53_2010 L1	SANSEW / WATER / - - Peel Table 2 - Storm Sewer Discharge - BL_53_2010 L2
BH22-9					
cis-1,2-Dichloroethene	EPA 5030B/8260C	mg/L	0.0115		0.0056
Total Suspended Solids	SM 2540D	mg/L	9560	350	15
Aluminum	SM 3030/EPA 200.8	mg/L	63.5	50	
Arsenic	SM 3030/EPA 200.8	mg/L	0.038		0.02
Chromium	SM 3030/EPA 200.8	mg/L	0.117		0.08
Copper	SM 3030/EPA 200.8	mg/L	0.129		0.05
Manganese	SM 3030/EPA 200.8	mg/L	5.44	5	0.05
Nickel	SM 3030/EPA 200.8	mg/L	0.135		0.08
Phosphorus	SM 3030/EPA 200.8	mg/L	3.76		0.4
Zinc	SM 3030/EPA 200.8	mg/L	0.37		0.04

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO5058-SEP22	mg/L	2	<2	9	20	111	80	120	91	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0050-SEP22	mg/L	2	< 2	15	30	102	70	130	82	70	130

Chlorine

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Chlorine	EWL0494-SEP22	mg/L	0.02	< 0.02	ND	20	99	90	110	NA		

QC SUMMARY

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0220-SEP22	mg/L	0.01	<0.01	ND	10	95	90	110	NV	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0495-SEP22	mg/L	0.06	<0.06	5	10	100	90	110	110	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0234-SEP22	mg/L	0.0002	<0.0002	ND	20	100	80	120	92	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0052-SEP22	mg/L	0.00001	< 0.00001	11	20	118	80	120	102	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0238-SEP22	mg/L	0.0005	<0.00005	ND	20	103	90	110	71	70	130
Aluminum (total)	EMS0238-SEP22	mg/L	0.01	<0.001	2	20	93	90	110	89	70	130
Arsenic (total)	EMS0238-SEP22	mg/L	0.002	<0.0002	6	20	106	90	110	103	70	130
Cadmium (total)	EMS0238-SEP22	mg/L	0.00003	<0.000003	20	20	103	90	110	91	70	130
Cobalt (total)	EMS0238-SEP22	mg/L	0.00004	<0.000004	7	20	104	90	110	102	70	130
Chromium (total)	EMS0238-SEP22	mg/L	0.0008	<0.00008	11	20	100	90	110	109	70	130
Copper (total)	EMS0238-SEP22	mg/L	0.002	<0.0002	14	20	100	90	110	91	70	130
Manganese (total)	EMS0238-SEP22	mg/L	0.0001	<0.00001	2	20	107	90	110	97	70	130
Molybdenum (total)	EMS0238-SEP22	mg/L	0.0004	<0.00004	7	20	94	90	110	100	70	130
Nickel (total)	EMS0238-SEP22	mg/L	0.001	<0.0001	0	20	100	90	110	92	70	130
Lead (total)	EMS0238-SEP22	mg/L	0.0009	<0.00001	14	20	94	90	110	89	70	130
Phosphorus (total)	EMS0238-SEP22	mg/L	0.03	<0.003	9	20	96	90	110	NV	70	130
Antimony (total)	EMS0238-SEP22	mg/L	0.009	<0.0009	ND	20	95	90	110	101	70	130
Selenium (total)	EMS0238-SEP22	mg/L	0.0004	<0.00004	7	20	101	90	110	95	70	130
Tin (total)	EMS0238-SEP22	mg/L	0.0006	<0.00006	ND	20	97	90	110	NV	70	130
Titanium (total)	EMS0238-SEP22	mg/L	0.0005	<0.00005	2	20	97	90	110	NV	70	130
Zinc (total)	EMS0238-SEP22	mg/L	0.02	<0.002	4	20	103	90	110	80	70	130
Aluminum (0.2µm)	EMS0242-SEP22	mg/L	0.001	<0.001	2	20	101	90	110	75	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9013-OCT22	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0393-SEP22	mg/L	0.01	<0.01			88	55	120			
Nonylphenol Ethoxylates	GCM0393-SEP22	mg/L	0.01	< 0.01								
Nonylphenol monoethoxylate	GCM0393-SEP22	mg/L	0.01	<0.01			90	55	120			
Nonylphenol	GCM0393-SEP22	mg/L	0.001	<0.001			91	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0482-SEP22	mg/L	2	<2	NSS	20	105	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0482-SEP22	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0482-SEP22	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0496-SEP22	No unit	0.05	NA	1		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0228-SEP22	mg/L	0.002	<0.002	ND	10	105	80	120	102	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0452-SEP22	ug/L	0.04	< 0.04	NSS	30	100	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
7Hdibenzo(c,g)carbazole	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Anthracene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	104	50	140	NSS	50	140
Benzo(a)anthracene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	100	50	140	NSS	50	140
Benzo(a)pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	103	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	99	50	140	NSS	50	140
Benzo(e)pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	98	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0499-SEP22	mg/L	0.0002	< 0.0002	NSS	30	99	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	102	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0499-SEP22	mg/L	0.002	< 0.002	NSS	30	137	50	140	NSS	50	140
Chrysene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	105	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0499-SEP22	mg/L	0.002	< 0.002	NSS	30	132	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	104	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	75	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	88	50	140	NSS	50	140
Fluoranthene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	109	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0499-SEP22	mg/L	0.0002	< 0.0002	NSS	30	109	50	140	NSS	50	140
Perylene	GCM0499-SEP22	mg/L	0.0005	< 0.0005	NSS	30	101	50	140	NSS	50	140
Phenanthrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	106	50	140	NSS	50	140
Pyrene	GCM0499-SEP22	mg/L	0.0001	< 0.0001	NSS	30	101	50	140	NSS	50	140

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0493-SEP22	mg/L	2	< 2	0	10	101	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0230-SEP22	as N mg/L	0.5	<0.5	1	10	103	90	110	108	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	95	60	130	99	50	140
1,1,2,2-Tetrachloroethane	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	95	60	130	97	50	140
1,2-Dichlorobenzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	99	50	140
1,4-Dichlorobenzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	97	50	140
Benzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	95	60	130	99	50	140
Chloroform	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	94	60	130	98	50	140
cis-1,2-Dichloroethene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	101	50	140
Ethylbenzene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	101	50	140
m-p-xylene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	99	50	140
Methyl ethyl ketone	GCM0420-SEP22	mg/L	0.02	<0.02	ND	30	91	50	140	98	50	140
Methylene Chloride	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	96	60	130	99	50	140
o-xylene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	99	60	130	103	50	140
Styrene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	100	50	140
Tetrachloroethylene (perchloroethylene)	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	98	60	130	101	50	140
Toluene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	99	50	140
trans-1,3-Dichloropropene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	99	60	130	103	50	140
Trichloroethylene	GCM0420-SEP22	mg/L	0.0005	<0.0005	ND	30	97	60	130	98	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.
This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm.
The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Reproduction of this analytical report in full or in part is prohibited.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 033384
Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Sofia
Received Date: 09/23/2022 (mm/dd/yy)
Received Time: 11:30 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☐ No ☐ Type: Ice
Temperature Upon Receipt (°C): 2 & 3
LAB LIMS #: CAL1622-Sep22

REPORT INFORMATION

Company: Accounting
Contact: Abdul Qadir
Address: 6221 Hwy 7, Unit 16, Vaughan ON
Phone: 204-951-8164
Fax:
Email: abdul.qadir@dsconsultants.ca

INVOICE INFORMATION

☑ (same as Report Information)
Company: Accounting
Contact:
Address:
Phone:
Email:

Quotation #:
P.O. #:
Project #: 22-200-100
Site Location/ID: 974 Lakeshore Rd E, Mississauga

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends).
Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:
☒ Sanitary
☒ Storm
Municipality: Peel / Mississauga

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Ti,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other (please specify)					Other: Sewer Use: Peel/Mississauga (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	SPLP: Specify tests (☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN)	TCLP: Specify tests (☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	BH22-9	22/Sep/2022	PM	20	GW	N															✓				Non filtered
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Abdul Qadir Signature:
Relinquished by (NAME): Abdul Qadir Signature:
Date: 09/23/22 (mm/dd/yy)
Date: 09/23/22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.5
Date of Issue: 02 May 2022

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 029536 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Nicole Briganz
Received Date: 10 / 05 / 22 (mm/dd/yy)
Received Time: 11 : 30 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: Ice packs
Temperature Upon Receipt (°C) 9.9.9
LAB LIMS #: CA-14622-SEP22

REPORT INFORMATION	INVOICE INFORMATION
Company: DS Consultants	☒ (same as Report Information)
Contact: Abdul Qadir	Company: Accounting
Address: 6221 Hwy 7, Unit 16, Vaughan, ON	Contact:
Phone: 204-951-8164	Address:
Fax:	Phone:
Email: abdul.qadir@dsconsultants.ca	Email:

Quotation #:
P.O. #:
Project #: 22-200-100
Site Location/ID: 974 Lakeshore Rd E, Mississauga

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:
*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table ____ Appx. ____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:
☒ Sanitary
☒ Storm
Municipality: Peel Region/ Mississauga

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other (please specify)	Other	Other	Other	Other: Sewer Use: Peel Region / Specify pkg: Mississauga	Other: Water Characterization Pkg General ☐ Extended ☐	SPLP: Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	TCLP: Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	BH22-9	03/oct/2022	Am	1	GW	N															✓				CA14622 Append
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Abdul Qadir Signature: Date: 10 / 03 / 22 (mm/dd/yy)
Relinquished by (NAME): Abdul Qadir Signature: Date: 10 / 03 / 22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Your Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Your C.O.C. #: 930059-01-01

Attention: PRADEEP PATEL

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2023/05/01
Report #: R7610413
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3A6391
Received: 2023/04/17, 13:05

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2023/04/20	2023/04/21	CAM SOP-00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2023/04/21	2023/04/26	CAM SOP-00427	SM 23 5210B m
Carbonaceous BOD	1	2023/04/19	2023/04/24	CAM SOP-00427	SM 23 5210B m
Total Cyanide	1	2023/04/20	2023/04/20	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2023/04/20	2023/04/20	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2023/04/20	2023/04/20	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by Axial ICP	1	2023/04/20	2023/04/25	CAM SOP-00408	EPA 6010D m
E.coli, (CFU/100mL)	1	N/A	2023/04/19	CAM SOP-00552	MECP E3371
Total Nonylphenol in Liquids by HPLC	1	2023/04/21	2023/04/22	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2023/04/21	2023/04/22	CAM SOP-00313	Bureau Veritas
Animal and Vegetable Oil and Grease	1	N/A	2023/04/24	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2023/04/24	2023/04/24	CAM SOP-00326	EPA1664B m,SM5520B m
Polychlorinated Biphenyl in Water	1	2023/04/20	2023/04/21	CAM SOP-00309	EPA 8082A m
pH	1	2023/04/20	2023/04/20	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2023/04/21	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Turbidimetry	1	N/A	2023/04/21	CAM SOP-00464	SM 23 4500-SO42- E m
Total Kjeldahl Nitrogen in Water	1	2023/04/20	2023/04/21	CAM SOP-00938	OMOE E3516 m
Total PAHs: Barrie/Mississauga Sewer Use (1)	1	N/A	2023/04/24	CAM SOP - 00301	
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2023/04/24	2023/04/24	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2023/04/20	2023/04/20	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2023/04/21	CAM SOP-00228	EPA 8260D

Remarks:

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

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

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

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Your Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Your C.O.C. #: 930059-01-01

Attention: PRADEEP PATEL

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2023/05/01
Report #: R7610413
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3A6391
Received: 2023/04/17, 13:05

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Total PAHs include only those PAHs specified in the sewer use by-by-law.
(2) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Encryption Key



Bureau Veritas
01 May 2023 18:02:12

Please direct all questions regarding this Certificate of Analysis to:
Ashton Gibson, Project Manager
Email: Ashton.Gibson@bureauveritas.com
Phone# (905)817-5765

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

MISSISSAUGA STORM SEWER BYLAW (46-2022)

Bureau Veritas ID			VOI141		
Sampling Date			2023/04/17		
COC Number			930059-01-01		
	UNITS	Criteria	BH22-14	RDL	QC Batch
Inorganics					
Total BOD	mg/L	15	<2	2	8620686
Calculated Parameters					
Total PAHs	ug/L	2	**<3.4 (1)**	3.4	8616586

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022
(1) RDL exceeds criteria

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

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

PEEL SANITARY & STORM SEWER (53-2010)

Bureau Veritas ID				VOI141			VOI141		
Sampling Date				2023/04/17			2023/04/17		
COC Number				930059-01-01			930059-01-01		
	UNITS	Criteria	Criteria-2	BH22-14	RDL	QC Batch	BH22-14 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	-	150	1.9	0.50	8611791			
Inorganics									
Total Carbonaceous BOD	mg/L	-	300	<2	2	8615705	<2	2	8615705
Fluoride (F-)	mg/L	-	10	0.22	0.10	8618800			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	0.30	0.10	8618510			
pH	pH	6:9	5.5:10.0	7.28		8618816			
Phenols-4AAP	mg/L	0.008	1	<0.0010	0.0010	8621267			
Total Suspended Solids	mg/L	15	350	**42**	10	8616229			
Dissolved Sulphate (SO4)	mg/L	-	1500	300	1.0	8618856			
Total Cyanide (CN)	mg/L	0.02	2	<0.0050	0.0050	8619331	<0.0050	0.0050	8619331
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	1.9	0.50	8624415			
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	<0.50	0.50	8624419			
Miscellaneous Parameters									
Nonylphenol Ethoxylate (Total)	mg/L	-	0.2	<0.025	0.025	8622178	<0.025	0.025	8622178
Nonylphenol (Total)	mg/L	-	0.02	<0.001	0.001	8621974			
Metals									
Total Aluminum (Al)	mg/L	1.0	50	0.1	0.1	8618519	0.1	0.1	8618519
Total Antimony (Sb)	mg/L	-	5	<0.02	0.02	8618519	<0.02	0.02	8618519
Total Arsenic (As)	mg/L	0.02	1	<0.01	0.01	8618519	<0.01	0.01	8618519
Total Cadmium (Cd)	mg/L	0.008	0.7	<0.002	0.002	8618519	<0.002	0.002	8618519
Total Chromium (Cr)	mg/L	0.08	5	<0.01	0.01	8618519	<0.01	0.01	8618519
Total Cobalt (Co)	mg/L	-	5	<0.002	0.002	8618519	<0.002	0.002	8618519
Total Copper (Cu)	mg/L	0.04	3	<0.01	0.01	8618519	<0.01	0.01	8618519
Total Lead (Pb)	mg/L	0.12	3	<0.01	0.01	8618519	<0.01	0.01	8618519
Total Manganese (Mn)	mg/L	2.0	5	0.018	0.001	8618519	0.017	0.001	8618519
Mercury (Hg)	mg/L	0.0004	0.01	<0.00010	0.00010	8618388			
Total Molybdenum (Mo)	mg/L	-	5	0.019	0.005	8618519	0.014	0.005	8618519

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022
Criteria-2: The Regional Municipality of Peel Sanitary Sewer Discharge.
By-Law Number 53-2010.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

PEEL SANITARY & STORM SEWER (53-2010)

Bureau Veritas ID				VOI141			VOI141		
Sampling Date				2023/04/17			2023/04/17		
COC Number				930059-01-01			930059-01-01		
	UNITS	Criteria	Criteria-2	BH22-14	RDL	QC Batch	BH22-14 Lab-Dup	RDL	QC Batch
Total Nickel (Ni)	mg/L	0.08	3	<0.005	0.005	8618519	<0.005	0.005	8618519
Total Phosphorus (P)	mg/L	0.4	10	<0.05	0.05	8618519	<0.05	0.05	8618519
Total Selenium (Se)	mg/L	0.02	1	<0.02	0.02	8618519	<0.02	0.02	8618519
Total Silver (Ag)	mg/L	0.12	5	<0.01	0.01	8618519	<0.01	0.01	8618519
Total Tin (Sn)	mg/L	-	5	<0.02	0.02	8618519	<0.02	0.02	8618519
Total Titanium (Ti)	mg/L	-	5	<0.005	0.005	8618519	<0.005	0.005	8618519
Total Zinc (Zn)	mg/L	0.2	3	<0.005	0.005	8618519	<0.005	0.005	8618519
Semivolatile Organics									
Bis(2-ethylhexyl)phthalate	ug/L	-	12	<8.0	8.0	8619798			
Di-N-butyl phthalate	ug/L	-	80	<8.0	8.0	8619798			
Volatile Organics									
Benzene	ug/L	2	10	<0.40	0.40	8618617			
Chloroform	ug/L	-	40	<0.40	0.40	8618617			
1,2-Dichlorobenzene	ug/L	5.6	50	<0.80	0.80	8618617			
1,4-Dichlorobenzene	ug/L	6.8	80	<0.80	0.80	8618617			
cis-1,2-Dichloroethylene	ug/L	-	4000	<1.0	1.0	8618617			
trans-1,3-Dichloropropene	ug/L	-	140	<0.80	0.80	8618617			
Ethylbenzene	ug/L	2	160	<0.40	0.40	8618617			
Methylene Chloride(Dichloromethane)	ug/L	5.2	2000	<4.0	4.0	8618617			
Methyl Ethyl Ketone (2-Butanone)	ug/L	-	8000	<20	20	8618617			
Styrene	ug/L	-	200	<0.80	0.80	8618617			
1,1,2,2-Tetrachloroethane	ug/L	17	1400	<0.80	0.80	8618617			
Tetrachloroethylene	ug/L	4.4	1000	<0.40	0.40	8618617			
Toluene	ug/L	2	270	<0.40	0.40	8618617			
Trichloroethylene	ug/L	7.6	400	<0.40	0.40	8618617			
p+m-Xylene	ug/L	-	-	<0.40	0.40	8618617			
o-Xylene	ug/L	-	-	<0.40	0.40	8618617			
Total Xylenes	ug/L	4.4	1400	<0.40	0.40	8618617			

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022
Criteria-2: The Regional Municipality of Peel Sanitary Sewer Discharge. By-Law Number 53-2010.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

PEEL SANITARY & STORM SEWER (53-2010)

Bureau Veritas ID				VOI141			VOI141		
Sampling Date				2023/04/17			2023/04/17		
COC Number				930059-01-01			930059-01-01		
	UNITS	Criteria	Criteria-2	BH22-14	RDL	QC Batch	BH22-14 Lab-Dup	RDL	QC Batch
PCBs									
Total PCB	ug/L	0.4	1	<0.05	0.05	8618461			
Microbiological									
Escherichia coli	CFU/100mL	200	-	0	N/A	8616957			
Surrogate Recovery (%)									
2,4,6-Tribromophenol	%	-	-	48		8619798			
2-Fluorobiphenyl	%	-	-	77		8619798			
2-Fluorophenol	%	-	-	28		8619798			
D14-Terphenyl	%	-	-	98		8619798			
D5-Nitrobenzene	%	-	-	87		8619798			
D5-Phenol	%	-	-	24		8619798			
Decachlorobiphenyl	%	-	-	94		8618461			
4-Bromofluorobenzene	%	-	-	99		8618617			
D4-1,2-Dichloroethane	%	-	-	115		8618617			
D8-Toluene	%	-	-	88		8618617			

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022
Criteria-2: The Regional Municipality of Peel Sanitary Sewer Discharge. By-Law Number 53-2010.
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

TEST SUMMARY

Bureau Veritas ID: VOI141
Sample ID: BH22-14
Matrix: Water

Collected: 2023/04/17
Shipped:
Received: 2023/04/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
ABN Compounds in Water by GC/MS	GC/MS	8619798	2023/04/20	2023/04/21	Kathy Horvat
Biochemical Oxygen Demand (BOD)	DO	8620686	2023/04/21	2023/04/26	Gurjot Kaur
Carbonaceous BOD	DO	8615705	2023/04/19	2023/04/24	Gurjot Kaur
Total Cyanide	SKAL/CN	8619331	2023/04/20	2023/04/20	Chloe Pollock
Fluoride	ISE	8618800	2023/04/20	2023/04/20	Kien Tran
Mercury in Water by CVAA	CV/AA	8618388	2023/04/20	2023/04/20	Gagandeep Rai
Total Metals Analysis by Axial ICP	ICPX	8618519	2023/04/20	2023/04/25	Medhat Nasr
E.coli, (CFU/100mL)	PL	8616957	N/A	2023/04/19	Sonja Elavinamannil
Total Nonylphenol in Liquids by HPLC	LC/FLU	8621974	2023/04/21	2023/04/22	Furneesh Kumar
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	8622178	2023/04/21	2023/04/22	Furneesh Kumar
Animal and Vegetable Oil and Grease	BAL	8611791	N/A	2023/04/24	Automated Statchk
Total Oil and Grease	BAL	8624415	2023/04/24	2023/04/24	Navneet Singh
Polychlorinated Biphenyl in Water	GC/ECD	8618461	2023/04/20	2023/04/21	Svitlana Shaula
pH	AT	8618816	2023/04/20	2023/04/20	Kien Tran
Phenols (4AAP)	TECH/PHEN	8621267	N/A	2023/04/21	Mandeep Kaur
Sulphate by Automated Turbidimetry	KONE	8618856	N/A	2023/04/21	Yogesh Patel
Total Kjeldahl Nitrogen in Water	SKAL	8618510	2023/04/20	2023/04/21	Jency Sara Johnson
Total PAHs: Barrie/Mississauga Sewer Use	CALC	8616586	N/A	2023/04/24	Automated Statchk
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	8624419	2023/04/24	2023/04/24	Navneet Singh
Total Suspended Solids	BAL	8616229	2023/04/20	2023/04/20	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	8618617	N/A	2023/04/21	Hai Son Tran

Bureau Veritas ID: VOI141 Dup
Sample ID: BH22-14
Matrix: Water

Collected: 2023/04/17
Shipped:
Received: 2023/04/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonaceous BOD	DO	8615705	2023/04/19	2023/04/24	Gurjot Kaur
Total Cyanide	SKAL/CN	8619331	2023/04/20	2023/04/20	Chloe Pollock
Total Metals Analysis by Axial ICP	ICPX	8618519	2023/04/20	2023/04/25	Medhat Nasr
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	8622178	2023/04/21	2023/04/22	Furneesh Kumar

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

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

Package 1	2.0°C

Sample VOI141 [BH22-14] : ABN Analysis: Due to the sample matrix, a smaller amount was used for analysis. Detection limits were adjusted accordingly.

Sample VOI141 [BH22-14] : VOC Analysis: Due to sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

QUALITY ASSURANCE REPORT

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8618461	Decachlorobiphenyl	2023/04/21	101	60 - 130	96	60 - 130	97	%				
8618617	4-Bromofluorobenzene	2023/04/21	103	70 - 130	102	70 - 130	102	%				
8618617	D4-1,2-Dichloroethane	2023/04/21	105	70 - 130	101	70 - 130	110	%				
8618617	D8-Toluene	2023/04/21	103	70 - 130	106	70 - 130	89	%				
8619798	2,4,6-Tribromophenol	2023/04/21	87	10 - 130	93	10 - 130	62	%				
8619798	2-Fluorobiphenyl	2023/04/21	51	30 - 130	64	30 - 130	77	%				
8619798	2-Fluorophenol	2023/04/21	26	10 - 130	48	10 - 130	40	%				
8619798	D14-Terphenyl	2023/04/21	93	30 - 130	99	30 - 130	96	%				
8619798	D5-Nitrobenzene	2023/04/21	55	30 - 130	87	30 - 130	87	%				
8619798	D5-Phenol	2023/04/21	18	10 - 130	31	10 - 130	28	%				
8615705	Total Carbonaceous BOD	2023/04/24					<2	mg/L	NC	30	91	85 - 115
8616229	Total Suspended Solids	2023/04/20					<10	mg/L	4.8	20	96	85 - 115
8618388	Mercury (Hg)	2023/04/20	102	75 - 125	103	80 - 120	<0.00010	mg/L	NC	20		
8618461	Total PCB	2023/04/21	96	60 - 130	80	60 - 130	<0.05	ug/L	NC	40		
8618510	Total Kjeldahl Nitrogen (TKN)	2023/04/21	82	80 - 120	100	80 - 120	<0.10	mg/L	NC (1)	20	118	80 - 120
8618519	Total Aluminum (Al)	2023/04/25	127 (2)	80 - 120	94	80 - 120	<0.1	mg/L	10	20		
8618519	Total Antimony (Sb)	2023/04/25	107	80 - 120	103	80 - 120	<0.02	mg/L	NC	20		
8618519	Total Arsenic (As)	2023/04/25	109	80 - 120	103	80 - 120	<0.01	mg/L	NC	20		
8618519	Total Cadmium (Cd)	2023/04/25	106	80 - 120	103	80 - 120	<0.002	mg/L	NC	20		
8618519	Total Chromium (Cr)	2023/04/25	107	80 - 120	101	80 - 120	<0.01	mg/L	NC	20		
8618519	Total Cobalt (Co)	2023/04/25	96	80 - 120	100	80 - 120	<0.002	mg/L	NC	20		
8618519	Total Copper (Cu)	2023/04/25	99	80 - 120	101	80 - 120	<0.01	mg/L	NC	20		
8618519	Total Lead (Pb)	2023/04/25	95	80 - 120	100	80 - 120	<0.01	mg/L	NC	20		
8618519	Total Manganese (Mn)	2023/04/25	97	80 - 120	100	80 - 120	<0.001	mg/L	3.9	20		
8618519	Total Molybdenum (Mo)	2023/04/25	103	80 - 120	104	80 - 120	<0.005	mg/L	NC	20		
8618519	Total Nickel (Ni)	2023/04/25	98	80 - 120	103	80 - 120	<0.005	mg/L	NC	20		
8618519	Total Phosphorus (P)	2023/04/25	104	80 - 120	99	80 - 120	<0.05	mg/L	NC	20		
8618519	Total Selenium (Se)	2023/04/25	107	80 - 120	105	80 - 120	<0.02	mg/L	NC	20		
8618519	Total Silver (Ag)	2023/04/25	98	80 - 120	98	80 - 120	<0.01	mg/L	NC	20		
8618519	Total Tin (Sn)	2023/04/25	99	80 - 120	103	80 - 120	<0.02	mg/L	NC	20		
8618519	Total Titanium (Ti)	2023/04/25	102	80 - 120	101	80 - 120	<0.005	mg/L	NC	20		

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8618519	Total Zinc (Zn)	2023/04/25	99	80 - 120	101	80 - 120	<0.005	mg/L	NC	20		
8618617	1,1,2,2-Tetrachloroethane	2023/04/21	101	70 - 130	97	70 - 130	<0.40	ug/L	NC	30		
8618617	1,2-Dichlorobenzene	2023/04/21	95	70 - 130	95	70 - 130	<0.40	ug/L	NC	30		
8618617	1,4-Dichlorobenzene	2023/04/21	110	70 - 130	113	70 - 130	<0.40	ug/L	NC	30		
8618617	Benzene	2023/04/21	91	70 - 130	89	70 - 130	<0.20	ug/L	NC	30		
8618617	Chloroform	2023/04/21	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30		
8618617	cis-1,2-Dichloroethylene	2023/04/21	NC	70 - 130	99	70 - 130	<0.50	ug/L	4.5	30		
8618617	Ethylbenzene	2023/04/21	85	70 - 130	87	70 - 130	<0.20	ug/L	NC	30		
8618617	Methyl Ethyl Ketone (2-Butanone)	2023/04/21	104	60 - 140	97	60 - 140	<10	ug/L	NC	30		
8618617	Methylene Chloride(Dichloromethane)	2023/04/21	98	70 - 130	94	70 - 130	<2.0	ug/L	NC	30		
8618617	o-Xylene	2023/04/21	86	70 - 130	94	70 - 130	<0.20	ug/L	NC	30		
8618617	p+m-Xylene	2023/04/21	73	70 - 130	75	70 - 130	<0.20	ug/L	NC	30		
8618617	Styrene	2023/04/21	81	70 - 130	85	70 - 130	<0.40	ug/L	NC	30		
8618617	Tetrachloroethylene	2023/04/21	90	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
8618617	Toluene	2023/04/21	94	70 - 130	95	70 - 130	<0.20	ug/L	NC	30		
8618617	Total Xylenes	2023/04/21					<0.20	ug/L	NC	30		
8618617	trans-1,3-Dichloropropene	2023/04/21	113	70 - 130	101	70 - 130	<0.40	ug/L	NC	30		
8618617	Trichloroethylene	2023/04/21	101	70 - 130	100	70 - 130	<0.20	ug/L	NC	30		
8618800	Fluoride (F-)	2023/04/20	94	80 - 120	98	80 - 120	<0.10	mg/L	NC	20		
8618816	pH	2023/04/20			102	98 - 103			0.71	N/A		
8618856	Dissolved Sulphate (SO4)	2023/04/21	NC	75 - 125	97	80 - 120	<1.0	mg/L	3.6	20		
8619331	Total Cyanide (CN)	2023/04/20	103	80 - 120	103	80 - 120	<0.0050	mg/L	NC	20		
8619798	Bis(2-ethylhexyl)phthalate	2023/04/21	99	30 - 130	102	30 - 130	<2.0	ug/L	NC	40		
8619798	Di-N-butyl phthalate	2023/04/21	92	30 - 130	95	30 - 130	<2.0	ug/L	NC	40		
8620686	Total BOD	2023/04/26					<2	mg/L	NC	30	92	80 - 120
8621267	Phenols-4AAP	2023/04/21	106	80 - 120	100	80 - 120	<0.0010	mg/L	18	20		
8621974	Nonylphenol (Total)	2023/04/22	107	50 - 130	107	50 - 130	<0.001	mg/L	NC	40		
8622178	Nonylphenol Ethoxylate (Total)	2023/04/22	101	50 - 130	99	50 - 130	<0.025	mg/L	NC	40		
8624415	Total Oil & Grease	2023/04/24			99	85 - 115	<0.50	mg/L	0.25	25		

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8624419	Total Oil & Grease Mineral/Synthetic	2023/04/24			96	85 - 115	<0.50	mg/L	0	25		

N/A = Not Applicable

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

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

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

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

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

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

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

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

(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

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

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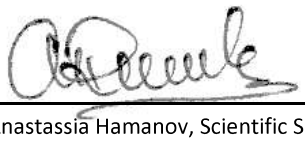
Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3A6391
Report Date: 2023/05/01

DS Consultants Limited
Client Project #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Sampler Initials: HS

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist



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



Sonja Elavinamannil, Master of Biochemistry, Team Lead

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Exceedance Summary Table – Mississauga Storm Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
BH22-14	VOI141-06	Total Suspended Solids	15	42	10	mg/L

Detection Limit Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
BH22-14	VOI141-03	Total PAHs	2	<3.4	3.4	ug/L

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

Exceedance Summary Table – Peel Region Sanitary 2010

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

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

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Your P.O. #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Your C.O.C. #: 930893-01-01

Attention: PRADEEP PATEL

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2023/05/10
Report #: R7623181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3C5477
Received: 2023/05/03, 16:42

Sample Matrix: Ground Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Chlorine	1	2023/05/04	2023/05/04	CAM SOP 00425	SM 23 4500-CL G m
Chromium (VI) in Water	1	N/A	2023/05/08	CAM SOP-00436	EPA 7199 m
PAH Compounds in Water by GC/MS (SIM)	1	2023/05/09	2023/05/09	CAM SOP-00318	EPA 8270E
Total PAHs: Barrie/Mississauga Sewer Use (1)	1	N/A	2023/05/10	CAM SOP - 00301	

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Total PAHs include only those PAHs specified in the sewer use by-by-law.

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Your P.O. #: 22-200-100
Site Location: RANGEVIEW RD, MISSISSAUGA
Your C.O.C. #: 930893-01-01

Attention: PRADEEP PATEL

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2023/05/10
Report #: R7623181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3C5477
Received: 2023/05/03, 16:42

Encryption Key



Bureau Veritas
10 May 2023 15:30:38

Please direct all questions regarding this Certificate of Analysis to:
Ashton Gibson, Project Manager
Email: Ashton.Gibson@bureauveritas.com
Phone# (905)817-5765

==========

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Bureau Veritas Job #: C3C5477
Report Date: 2023/05/10

DS Consultants Limited
Site Location: RANGEVIEW RD, MISSISSAUGA
Your P.O. #: 22-200-100
Sampler Initials: HS

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		VSF740		
Sampling Date		2023/05/03		
COC Number		930893-01-01		
	UNITS	BH 22-14	RDL	QC Batch
Inorganics				
Total Chlorine	mg/L	<0.1	0.1	8646949

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3C5477
Report Date: 2023/05/10

DS Consultants Limited
Site Location: RANGEVIEW RD, MISSISSAUGA
Your P.O. #: 22-200-100
Sampler Initials: HS

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Bureau Veritas ID		VSF740		
Sampling Date		2023/05/03		
COC Number		930893-01-01		
	UNITS	BH 22-14	RDL	QC Batch
Metals				
Chromium (VI)	ug/L	<0.50	0.50	8648136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

SEMI-VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Bureau Veritas ID		VSF740		
Sampling Date		2023/05/03		
COC Number		930893-01-01		
	UNITS	BH 22-14	RDL	QC Batch
Calculated Parameters				
Total PAHs	ug/L	<0.20	0.20	8645642
Polyaromatic Hydrocarbons				
Biphenyl	ug/L	<0.050	0.050	8653288
Acenaphthene	ug/L	<0.050	0.050	8653288
Acenaphthylene	ug/L	<0.050	0.050	8653288
Anthracene	ug/L	<0.050	0.050	8653288
Benzo(a)anthracene	ug/L	<0.050	0.050	8653288
Benzo(a)pyrene	ug/L	<0.0090	0.0090	8653288
Benzo(b/j)fluoranthene	ug/L	<0.050	0.050	8653288
Benzo(g,h,i)perylene	ug/L	<0.050	0.050	8653288
Benzo(k)fluoranthene	ug/L	<0.050	0.050	8653288
Chrysene	ug/L	<0.050	0.050	8653288
Dibenzo(a,h)anthracene	ug/L	<0.050	0.050	8653288
Fluoranthene	ug/L	<0.050	0.050	8653288
Fluorene	ug/L	<0.050	0.050	8653288
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	8653288
1-Methylnaphthalene	ug/L	<0.050	0.050	8653288
2-Methylnaphthalene	ug/L	<0.050	0.050	8653288
Naphthalene	ug/L	<0.050	0.050	8653288
Phenanthrene	ug/L	<0.030	0.030	8653288
Pyrene	ug/L	<0.050	0.050	8653288
Surrogate Recovery (%)				
D10-Anthracene	%	114		8653288
D14-Terphenyl (FS)	%	106		8653288
D8-Acenaphthylene	%	100		8653288

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3C5477
Report Date: 2023/05/10

DS Consultants Limited
Site Location: RANGEVIEW RD, MISSISSAUGA
Your P.O. #: 22-200-100
Sampler Initials: HS

TEST SUMMARY

Bureau Veritas ID: VSF740
Sample ID: BH 22-14
Matrix: Ground Water

Collected: 2023/05/03
Shipped:
Received: 2023/05/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Chlorine	SPEC	8646949	2023/05/04	2023/05/04	Leily Karimi
Chromium (VI) in Water	IC	8648136	N/A	2023/05/08	Theodora Luck
PAH Compounds in Water by GC/MS (SIM)	GC/MS	8653288	2023/05/09	2023/05/09	Jonghan Yoon
Total PAHs: Barrie/Mississauga Sewer Use	CALC	8645642	N/A	2023/05/10	Automated Statchk

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

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

Package 1	4.3°C

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3C5477
Report Date: 2023/05/10

QUALITY ASSURANCE REPORT

DS Consultants Limited
Site Location: RANGEVIEW RD, MISSISSAUGA
Your P.O. #: 22-200-100
Sampler Initials: HS

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8653288	D10-Anthracene	2023/05/09	104	50 - 130	101	50 - 130	113	%		
8653288	D14-Terphenyl (FS)	2023/05/09	102	50 - 130	104	50 - 130	105	%		
8653288	D8-Acenaphthylene	2023/05/09	98	50 - 130	100	50 - 130	100	%		
8646949	Total Chlorine	2023/05/04	70 (1)	85 - 115	99	85 - 115	<0.1	mg/L	NC	25
8648136	Chromium (VI)	2023/05/08	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
8653288	1-Methylnaphthalene	2023/05/09	81	50 - 130	79	50 - 130	<0.050	ug/L	NC	30
8653288	2-Methylnaphthalene	2023/05/09	72	50 - 130	70	50 - 130	<0.050	ug/L	NC	30
8653288	Acenaphthene	2023/05/09	102	50 - 130	99	50 - 130	<0.050	ug/L	NC	30
8653288	Acenaphthylene	2023/05/09	100	50 - 130	95	50 - 130	<0.050	ug/L	NC	30
8653288	Anthracene	2023/05/09	106	50 - 130	102	50 - 130	<0.050	ug/L	NC	30
8653288	Benzo(a)anthracene	2023/05/09	106	50 - 130	103	50 - 130	<0.050	ug/L	NC	30
8653288	Benzo(a)pyrene	2023/05/09	109	50 - 130	106	50 - 130	<0.0090	ug/L	NC	30
8653288	Benzo(b/j)fluoranthene	2023/05/09	115	50 - 130	115	50 - 130	<0.050	ug/L	NC	30
8653288	Benzo(g,h,i)perylene	2023/05/09	129	50 - 130	126	50 - 130	<0.050	ug/L	NC	30
8653288	Benzo(k)fluoranthene	2023/05/09	123	50 - 130	115	50 - 130	<0.050	ug/L	NC	30
8653288	Biphenyl	2023/05/09	75	50 - 130	72	50 - 130	<0.050	ug/L		
8653288	Chrysene	2023/05/09	111	50 - 130	110	50 - 130	<0.050	ug/L	NC	30
8653288	Dibenzo(a,h)anthracene	2023/05/09	111	50 - 130	100	50 - 130	<0.050	ug/L	NC	30
8653288	Fluoranthene	2023/05/09	121	50 - 130	119	50 - 130	<0.050	ug/L	NC	30
8653288	Fluorene	2023/05/09	103	50 - 130	100	50 - 130	<0.050	ug/L	NC	30
8653288	Indeno(1,2,3-cd)pyrene	2023/05/09	120	50 - 130	117	50 - 130	<0.050	ug/L	NC	30
8653288	Naphthalene	2023/05/09	87	50 - 130	85	50 - 130	<0.050	ug/L	NC	30
8653288	Phenanthrene	2023/05/09	106	50 - 130	105	50 - 130	<0.030	ug/L	NC	30

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8653288	Pyrene	2023/05/09	116	50 - 130	115	50 - 130	<0.050	ug/L	NC	30

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

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

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

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

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

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

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

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C3C5477
Report Date: 2023/05/10

DS Consultants Limited
Site Location: RANGEVIEW RD, MISSISSAUGA
Your P.O. #: 22-200-100
Sampler Initials: HS

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Senior Scientific Specialist

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Bureau Veritas Job #: C3C5477
Report Date: 2023/05/10

DS Consultants Limited
Site Location: RANGEVIEW RD, MISSISSAUGA
Your P.O. #: 22-200-100
Sampler Initials: HS

Exceedance Summary Table – Mississauga Storm Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

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

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Appendix E: Conceptual Development Plan

RANGEVIEW ESTATES

Ownership Map



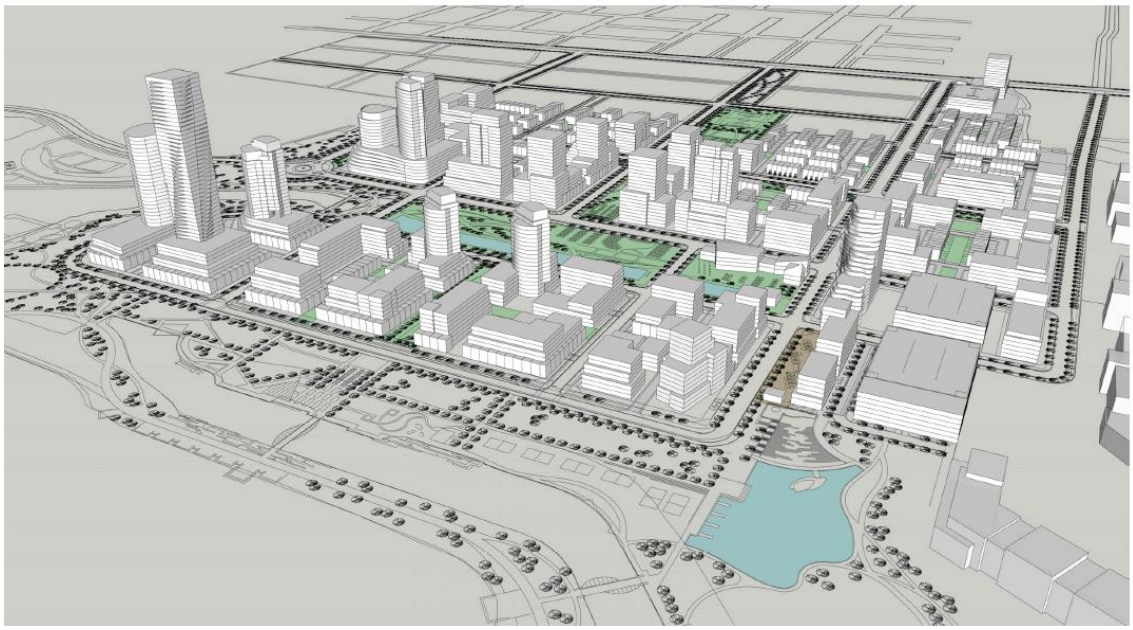
- Dorsay (Lakeshore) Inc.
  Dorsay (Lakefront Promenade) Inc.
  Dorsay (Rangeview) Inc.
- Elgroup Holdings Inc.
  Elias Bros. Construction Limited
- Rangeview 1035 Holding Inc.
  Rangeview 1045 Holding Inc.
  1207238 Ontario Limited Inc.
- 2120412 Ontario Inc.
- Whiterock 880 Rangeview Inc.
- 447111 Ontario Limited
- 1127792 Ontario Limited
- ILSCO of Canada Limited
- Kotyck Investments Ltd.

Legend Rangeview Estates Precinct Area (Gross Area = ~25.67 ha) | Non-Participating Landowners | Existing Parcel Lines

BOUSFIELDS INC.
PLANNING | DESIGN | ENGAGEMENT

REPORT ON

Preliminary Geotechnical Investigation
Proposed Residential & Commercial Development
800 Hydro Road
Mississauga, Ontario



PREPARED FOR:

Lakeview Community Partners Limited

PREPARED BY:

DS Consultants Ltd.

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project No: 18-519-10 R2
Date: June 9, 2020

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Appendix A: Photographs of Rock Cores

General Comments on Shale Bedrock in Greater Toronto Area

APPENDIX B: LOGS AND LOCATION PLAN OF EXP BOREHOLES

APPENDIX C: GEOPHYSICAL SURVEY REPORT BY GEOPHYSICS GPR INTERNATIONAL INC.

1. INTRODUCTION

DS Consultants Ltd. (DS) was retained by the ARGO Development Corporation on behalf of Lakeview Community Partners Limited to carry out preliminary geotechnical and hydrogeological investigations for the proposed Lakeview Village on the lands of the former Lakeview Power Generation Station located at 800 Hydro Road in Mississauga, Ontario.

It is understood that the proposed 71.6-hectare Lakeview Village will include 5,000 to 7,000 new homes in a variety of housing options, including townhouses, mid-rise and high-rise buildings. There will be more than 600,000 square feet of employment and institutional use and another 200,000 square feet of cultural space. Lakeview Village will include a Serson Square, a year-round central gathering space with retail offices and homes that can be used as an arts and cultural hub.

The proposed high-rise structures will entail up to 3-levels of basement. The finished basement floor elevations are not available to us at the time of writing this report.

exp Services Inc (exp.) conducted a preliminary geotechnical investigation at the subject site in December 2017 and drilled nine (9) boreholes as a part of their field work. The logs and location plan of exp. boreholes (BH1 to BH9) are attached in **Appendix B** of this report.

The purpose of this geotechnical investigation was to determine the subsurface conditions at the borehole locations and make preliminary engineering recommendations for the following:

1. Foundations
2. Floor slabs and permanent drainage
3. Earth pressures
4. Excavations and backfill
5. Earthquake considerations
6. Pavements
7. Underground utilities

This report deals with geotechnical issues only. Preliminary hydrogeological findings by DS will be presented in a separate report. Environmental testing was not part of our scope of work.

This report is provided on the basis of the assumption that the design will be in accordance with the applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional borings and reporting before the recommendations of this office can be relied upon.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario, Canada. The format and contents are guided by client specific needs and economics and conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

The foundation recommendations made in this report are based on the subsoil conditions found during the field investigation. The comments made in this report on potential construction problems and possible construction options intended only for guidance of the designer.

This report has been prepared for Lakeview Community Partners Limited and its architects and designers. Third party use of this report without DS Consultants Ltd. consent is prohibited.

2. FIELD WORK & LAB TESTING

Forty-five (45) boreholes (BH18-1 to BH18-49, except BH18-22 to BH18-24 and BH18-26, see Drawing 1 and 1A for location plan) were drilled at the site to depths varying from 1.7 m to 48.3m below the existing grade.

Four boreholes (BH18-22 to BH18-24 and BH18-26) were not be drilled due to the on-going construction work related to removal of buried concrete slabs associated with the former powerhouse.

Boreholes were drilled with solid stem and hollow stem continuous flight auger equipment by a drilling sub-contractor under the direction and supervision of DS Consultants Ltd personnel. Mud rotary was used in the drilling of some deep boreholes. Samples were retrieved at regular intervals with a 50 mm O.D. split-barrel sampler driven with a hammer weighing 624 N and dropping 760 mm in accordance with the Standard Penetration Test (SPT) method. The samples were logged in the field and returned to the DS Consultants Ltd laboratory for detailed examination by the project engineer and for laboratory testing.

Shale bedrock was cored at five (5) borehole locations (BH18-19, BH18-29, BH18-32, BH18-37 and BH18-45), with HQ double tube wireline equipment providing 63.5mm diameter rock core samples. The coring was carried out under the full-time supervision of a representative from DS who identified and described the rock samples, noting and recording the percentages of total and solid rock core recovery, RQD values, fracture index and the percentage and thicknesses of hard layers.

As well as visual examination in the laboratory, majority of the soil samples were tested for moisture contents. Selected fourteen (14) soil samples were subjected to grain size analyses and gradation curves are presented on Drawings 58 & 59. Atterberg's Limits tests were conducted on selected five (5) soil samples and results are presented on the respective borehole logs.

Water level observations were made during drilling and in the open boreholes at the completion of the drilling operations. Monitoring wells were installed in overburden and bedrock at seven (7) borehole locations for the longer-term groundwater level monitoring.

Methane gas measurements were taken in boreholes during drilling and upon completion of drilling, using a portable multi-gas detector RKI Eagle 2 instrument.

The ground surface elevations at the borehole locations was undertaken by DS personnel, using the differential GPS unit, leased from Sokkia Inc.

Geophysical survey was carried out at the subject site by the sub-contractor, Geophysics GPR International Inc. and their report is attached in **Appendix C** of this report.

3. SITE AND SUBSURFACE CONDITIONS

The subject site is located at 800 Hydro Road in Mississauga, approximately three kilometers east of Port Credit, on Mississauga's waterfront. The subject property primarily consists of former OPG Lakeview Coal plant that was decommissioned between 2006 & 2008 and the City own lands that is currently being used as playing fields and parking lot. The topography of the site has gentle slope towards south towards Lake Ontario, with elevations decreasing from 84m to 77m. At the time of our field work, the existing concrete slabs associated with the former OPG powerhouse were being removed by the contractor.

The borehole location plan is shown on Drawings 1 and 1A. Notes on samples description are provided on Drawing 1B. The subsurface conditions in the boreholes are presented in the individual borehole log on Drawings 2 to 46. Generalized sub-surface profiles are provided on Drawing 47 to 57.

Based on the borehole information, there is a significant variation in the bedrock depths at site along the north-south and east-west directions. There is a bedrock valley within the site, with the bedrock surface depths varying from 1.5m to at or below 48.3m. To delineate the bedrock valley and for the ease of describing the geotechnical conditions, the site is sub-divided into three areas (Area A, Area B & Area C, see Drawing 1 for areas & respective borehole locations). The subsurface conditions in the boreholes, area wise, are summarized in the following paragraphs.

3.1 Soil Conditions in Area 'A'

Seventeen boreholes (BH18-14, BH18-19, BH18-21, BH18-25, BH27 to BH18-38 and BH18-49) were drilled within Area 'A'. All boreholes were drilled to shale bedrock.

Topsoil, Pavement Structure & Fill Materials: A surficial topsoil layer, ranging in thickness from 125 to 350mm, was encountered at BH18-21, BH18-33 to BH18-38 & BH18-49. Two boreholes (BH18-28 & BH18-30) drilled on the paved areas encountered 70mm of asphalt at the surface, overlying granular base/subbase. Fill materials were found in all boreholes, extending to depths varying from 0.8 to 4.2m below the existing grade. Fill material was heterogeneous and consisted of sand & gravel, crusher run limestone, silty sand, sandy silt and clayey silt to silty clay, with inclusions of organics/topsoil, wood,

concrete, asphalt and shale fragments. The SPT 'N' values recorded in fill materials ranged from 5 to over 50 blows per 300mm of spoon penetration, indicating loose to very dense state of relative density.

Clayey Silt to Silty Clay Till: Below the fill materials, clayey silt to silty clay till deposits were encountered in BH18-14, BH18-19, BH18-29, and BH18-34 to BH18-38 (except BH18-35), overlying shale bedrock or silty clay. Clayey silt till was present in a stiff to hard consistency, with measured SPT 'N' values ranging from 8 to over 50 blows per 300mm of spoon penetration. Occasional cobble/boulders and sand seams were encountered within this deposit.

Grain size analysis of one soil sample (BH18-33/SS3) was conducted. The results are shown on Drawing 59, with the following fractions:

Clay: 29%
Silt: 46%
Sand: 23%
Gravel: 2%

Atterberg limits testing of one soil sample (BH18-33/SS3) was conducted. The results are shown on the borehole log and are summarized as follows:

Liquid limit (W_L): 34%
Plastic limit (W_P): 21%
Plasticity index (PI): 13

Silty Clay: A silty clay deposit was encountered in BH18-25, BH18-27, BH18-30 and BH18-36, below the fill material, or cohesionless soils or clayey silt till, and overlying shale bedrock. Silty clay was present in a firm to hard, generally hard consistency, with measured SPT 'N' values ranging from 6 to more than 50 blows for 300 mm penetration.

Grain size analysis of one soil sample (BH18-36/SS4) was conducted. The results are shown on Drawing 59 with the following fractions:

Clay: 32%
Silt: 57%
Sand: 11%

Atterberg limits testing of same soil sample (BH18-36/SS7) was conducted. The results are shown on the borehole log and are summarized as follows:

Liquid limit (W_L): 37%
Plastic limit (W_P): 23%
Plasticity index (PI): 14

Cohesionless Soils (Sand & Gravel, Sand): Cohesionless soils consisting of sand and gravel and sand were encountered in boreholes BH18-25, to BH18-28, BH18-32 below the fill material. These

cohesionless soils were water bearing and present in a very loose to very dense state, as indicated by the measured SPT 'N' values of nil to over 50 blows per 300mm of spoon penetration.

Sandy Silt Till: A sandy silt till deposit was encountered in BH18-49 below the fill material, extending to a depth of 4.5m, overlying shale bedrock. Sandy silt till was present in a compact to dense state, as indicated by the measured SPT 'N' values of 29 to 31 blows per 300mm of spoon penetration. Occasional cobble/boulders and sand seams were encountered within this deposit.

Shale Bedrock:

In Area 'A', shale bedrock of Georgian Bay Formation was found at all borehole locations, at depths ranging from 1.5 to 6.3m below the existing grade, corresponding to elevations ranging from 71.2 to 80.1m. The approximate depth and elevation of the shale bedrock surface at the borehole locations are listed on Table 3.1 below.

Table 3.1: Approximate Depth and Elevation of Shale Bedrock Surface in Area 'A'

Borehole No.	Depth of Shale Bedrock Surface below Existing Ground (m)	Approximate Elevation of Shale Bedrock Surface (m)	Notes
BH18-14	2.3	78.1	Augered
BH18-19	4.5	76.2	CORED
BH18-21	1.5	78.2	Augered
BH18-25	4.2	73.3	Augered
BH18-27 (30a)	3.8	73.5	Augered
BH18-28	3.3	79.5	Auger refusal
BH18-29A	6.3	71.2	cored
BH18-30	1.5	75.7	Augered
BH18-31	3.8	73.5	Augered
BH18-32	4.3	72.9	CORED
BH18-33	3.8	75.7	Augered
BH18-34	3.1	77.0	Augered
BH18-35	4.2	73.7	Augered
BH18-36	4.6	75.7	Augered
BH18-37	3.1	78.2	CORED
BH18-38	4.6	75.7	Augered
BH18-49	4.5	76.3	Augered
BH3*	**3.2**	**74.1**	**CORED**
BH5*	**3.5**	**76.8**	**Augered**
BH6*	**1.3**	**75.8**	**Augered**
BH9*	**4.4**	**74.6**	**CORED**

*exp. boreholes

Detailed description of shale bedrock is provided in Section 3.4.

3.2 Soil Conditions in Area 'B'

Twenty-two (22) boreholes (BH18-1 to BH18-13, BH18-15 to BH18-18, BH18-20, BH18-39, BH18-40, BH18-46 & BH18-48) were drilled within Area 'B', to depths ranging from 11.1 to 48.3m.

Topsoil, Pavement Structure & Fill Materials: A surficial topsoil layer, ranging in thickness from 100 to 350mm, was encountered at BH18-1, BH18-3 to BH18-6, BH18-10 to BH18-12, BH18-16, BH18-39, BH18-40 and BH18-48). Three boreholes (BH18-2, BH18-17 and BH18-20) drilled on the paved areas encountered 70 to 100mm of asphalt at the surface, overlying granular base/subbase. Fill materials were found in all boreholes, extending to depths varying from 0.8 to 3.1m below the existing grade. Fill material was heterogeneous and consisted of clayey silt, silty clay, silty sand, sandy silt, silt and sand and gravel, with inclusions of organics/topsoil in varying proportions and trace asphalt & shale fragments. The SPT 'N' values recorded in fill materials ranged from 4 to 50 blows per 300mm of spoon penetration, indicating loose to very dense state of relative density.

Clayey Silt to Silty Clay Till: Clayey silt to silty clay till deposits of varying thicknesses were encountered in boreholes at varying depths. Clayey silt to silty clay till was present in a stiff to hard consistency, with measured SPT 'N' values ranging from 14 to over 50 blows per 300mm of spoon penetration. Occasional cobble/boulders and sand seams were encountered within this deposit.

Grain size analysis of four soil samples from clayey silt to silty clay till (BH18-1/SS5, BH18-2/SS6, BH18-7/SS12 & BH18-15/SS3) were conducted. The results are shown on Drawings 58 & 59, with the following fractions:

Clay:	16 to 37%
Silt:	33 to 48%
Sand:	15 to 49%
Gravel:	1 to 9%

Atterberg limits testing of two soil samples (BH18-2/SS6 & BH18-3/SS15) were conducted. The results are shown on the borehole logs and are summarized as follows:

Liquid limit (W_L):	19 to 20%
Plastic limit (W_P):	11 to 12%
Plasticity index (PI):	8

Clayey Silt to Silty Clay: Clayey silt to silty clay deposit of varying thicknesses were encountered in boreholes at varying depths of the boreholes. Clayey silt o silty clay was present in a firm to hard, generally in very stiff consistency, with measured SPT 'N' values ranging from 6 to more than 50 blows for 300 mm penetration.

Grain size analysis of one soil sample (BH18-6/SS12) was conducted. The results are shown on Drawings 58 with the following fractions:

Clay: 68%
Silt: 26%
Sand: 6%

Atterberg limits testing of same soil sample (BH18-6/SS12) was conducted. The results are shown on the borehole log and are summarized as follows:

Liquid limit (W_L): 48%
Plastic limit (W_P): 23%
Plasticity index (PI): 25

Sandy Silt to Silty Sand Till: Sandy silt to silty sand till deposits of varying thicknesses were encountered in boreholes at varying depths. Sandy silt to silty sand till was generally water bearing and present in a very dense state, with measured SPT 'N' values of over 50 blows per 300mm of spoon penetration. Occasional to frequent cobble/boulders should be expected within this deposit.

Cohesionless Soils (Sand & Gravel, Sand, Silty Sand, Sandy Silt, Silt): Cohesionless soils consisting of sand & gravel, sand, silty sand, sandy silt, silt were encountered in majority of boreholes, embedded within the glacial till, at varying depths. These cohesionless soils were water bearing and present in a compact to very dense state, as indicated by the measured SPT 'N' values of 22 to over 50 blows per 300mm of spoon penetration.

Grain size analyses of seven (7) soil sample (BH18-2/SS3, BH18-3/SS10, BH18-8/SS7, BH18-8/SS8, BH18-8/SS12, BH18-9/SS5 and BH18-40/SS7) were conducted. The results are shown on Drawings 58 and 59, with the following fractions: 2

Clay: 2 to 10%
Silt: 3 to 62%
Sand: 23 to 95%
Gravel: up to 4%

Shale Bedrock:

In Area 'B', shale bedrock Georgian Bay Formation was found at five (5) borehole locations (BH18-6, BH18-9, BH18-15, BH18-18 & BH18-20), at depths ranging from 9.1 to 48.1 below the existing grade, corresponding to elevations ranging from 34.7 to 71.3m. There is a bedrock valley in this area which was further confirmed by the geophysics testing. The approximate depth and elevation of the shale bedrock surface at the borehole locations are listed on Table 3.2 below.

Table 3.2: Approximate Depth and Elevation of Shale Bedrock Surface in Area 'B'

Borehole No.	Depth of Shale Bedrock Surface below Existing Ground (m)	Approximate Elevation of Shale Bedrock Surface (m)	Notes
BH18-6	48.1	34.7	Augered
BH18-7	>30.7		Not encountered at 30.7m
BH18-9	15.2	65.0	Augered
BH18-15	9.1	71.3	Augered
BH18-18	13.7	67.4	Augered
BH18-20	10.7	69.6	Augered
BH2*	**12.0**	**68.3**	**Augered**

*exp. boreholes

Detailed description of shale bedrock is provided in Section 3.4.

3.3 Soil Conditions in Area 'C'

Six boreholes (BH18-41 to BH18-45 and BH18-47) were drilled within Area 'C'. All boreholes were drilled to shale bedrock.

Topsoil & Fill Materials: A surficial topsoil layer, ranging in thickness from 150 to 400mm, was encountered at borehole locations. Fill materials were found in all boreholes, extending to depths varying from 0.8 to 3.4m below the existing grade. Fill material was heterogeneous and consisted of clayey silt, silty clay, sandy silt, and sand & gravel with trace inclusions of organics/topsoil, brick, concrete, asphalt and shale fragments. The SPT 'N' values recorded in fill materials ranged from 4 to 17 blows per 300mm of spoon penetration, indicating loose to compact/firm to stiff state of compactness.

Clayey Silt to Silty Clay Till: Below the fill materials or silt/sandy silt, clayey silt to silty clay till deposits were encountered in boreholes, overlying shale bedrock or silt/sandy silt. Clayey silt till was present in a stiff to hard consistency, with measured SPT 'N' values ranging from 13 to over 50 blows per 300mm of spoon penetration.

Cohesionless Soils (Silt, Sandy Silt to Silty Sand): Cohesionless soils consisting of silt and sandy silt to silty sand were encountered in all boreholes, except in BH18-43 and BH18-44 below the fill material or clayey silt till. These cohesionless soils were generally water bearing and present in a very loose to dense state, as indicated by the measured SPT 'N' values of 5 to 32 blows per 300mm of spoon penetration.

Shale Bedrock: In Area 'C', shale bedrock of Georgian Bay Formation was found at all borehole locations, at depths ranging from 3.1 to 7.6m below the existing grade, corresponding to elevations ranging from 75.7 to 80.4m. The approximate depth and elevation of the shale bedrock surface at the borehole locations are listed on Table 3.3 below.

Table 3.3: Approximate Depth and Elevation of Shale Bedrock Surface in Area 'C'

Borehole No.	Depth of Shale Bedrock Surface below Existing Ground (m)	Approximate Elevation of Shale Bedrock Surface (m)	Notes
BH18-41	7.6	75.7	Augered
BH18-42	6.1	79.6	Augered
BH18-43	3.1	80.4	Augered
BH18-44	3.8	80.1	Augered
BH18-45	3.8	79.2	CORED
BH18-47	6.1	76.3	Augered
BH7*	3.6	79.8	CORED

*exp. boreholes

Detailed description of shale bedrock is provided in Section 3.4.

3.4 Shale Bedrock (Georgian Bay Formation)

Shale bedrock belonging to Georgian Bay Formation was encountered at this site. Because of the method of drilling and sampling, the surface elevations of the bedrock can be different than indicated on the borehole logs (Drawings 2 to 46). Commonly the till overlying the shale contains slabs of limestone which would give a false indication of the bedrock level. Similarly, the depth of weathering cannot be determined accurately due to the presence of limestone layers.

Shale bedrock was cored at five (5) borehole locations (BH18-19, BH18-29, BH18-32, BH18-37 and BH18-45) to confirm the depth and quality of bedrock.

Photographs of the bedrock cores are also presented in **Appendix A** of the report. The descriptive terms used on the record of rock cores and throughout this report are explained on the "Explanation of Terms Used in the Bedrock Core Log" sheet in Appendix A. **Appendix A** also presents more details and general comments about the shale bedrock in Toronto area.

Total Core Recovery (TCR):

The total core recovery indicates the total length of rock core recovered, expressed as a percentage of the actual length of the core run. The total core recovery for the cored runs ranged from 67 to 100%. Generally, less core recovery was experienced only near the surface of the rock, where the formation is highly to moderately weathered and was almost full as depth increased.

Solid Core Recovery (SCR):

The solid core recovery is the total length of solid, full diameter rock core that was recovered, expressed as a percentage of the length of the core run. Solid core recovery ranged from 28 to 98%, and also

appears to generally improve with depth. The SCR index was generally influenced by the orientations of the fractures. SCR was low when fractures oblique to the borehole axis were intercepted.

Rock Quality Designation (RQD):

The rock quality designation index is obtained by measuring the total length of recovered rock core pieces which are longer than 100mm and expressing their sum total length as a percentage of the length of the core run. RQD is a function of the frequency of joints, bedding plane partings and fractures in the rock cores. While the use of double tube core barrels provided reasonably good protection of the core during drilling and core retrieval, the fissile nature of the shale greatly influences the RQD values of the rock cores. Consequently, it is believed that the RQD values recorded underestimate the rock quality classification of the laminated fissile shale. On the basis of the recorded RQD values which range from nil to 97%, the rock quality is estimated to be “very poor” to “excellent”, and the average value of more than 50% suggests a rock of generally “fair” quality.

Hard Layers:

Based on the visual examination of the rock cores, an attempt was made to identify and record the thickness and percentages of the relatively harder siltstone and limestone layers. The percentage of the “hard layers” per core run ranges between nil and 32%. The thickness of these layers varied but was generally varied from 50 to 380mm, but thicker layers have been observed to be as much as 750 to 900 mm at other sites. The layers are actually lenses and they can vary significantly in thickness over short distance. Encountering such thick layers should be anticipated. It is also common to encounter closely spaced groupings of thin strong limestone/siltstone layers which individually may only be 25 to 50mm thick but collectively can be 1m in thickness.

Fracture Index:

When logging the rock cores, the fracture Index (i.e. the number of fractures for each 0.3m length of core) was also recorded. The recorded values range between nil and greater than 25. Occasional fragmented and broken zones were encountered within the solid core. Bedrock was fragmented up to a depth of about 4.9m m in BH18-37, as indicated by nil solid core recovery in this zone. It was observed that the planes of weaknesses along which the cores tended to break, included planes of fissility and bedding, the contact surfaces between shale and siltstone or limestone bands and some oblique and subvertical joints.

Weathering:

In general, moderately weathered zone in the bedrock was limited to about 1.5 m from the bedrock surface. Below this, the degree of weathering ranged from slightly weathered to fresh. The siltstone and limestone layers were generally fresh with only slight surficial weathering on joint surfaces in the zone close to bedrock surface.

Methane Gas:

Methane gas under pressure was encountered in BH18-13 below a depth of about 11m, which is possibly just above the bedrock surface. The borehole was terminated at this depth and properly sealed. Although, during the rock coring there were no physical indications of the presence of gas in the coreholes, the Georgian Bay Formation is known to contain pockets of combustible gas. Therefore, appropriate care and monitoring are essential in all confined excavation work, particularly caissons and tunnels.

3.5 Groundwater Conditions

During drilling, short-term (un-stabilized) groundwater levels were found at depths ranging from 1.5 to 18.3m below the existing grade. Long-term (stabilized) groundwater levels in the monitoring wells were found at depths ranging from 2.0 to 8.0m below the existing grade, corresponding to Elevations of 74.9 to 80.2m. The results of the water level readings taken on Sept. 26, 2018 in the monitoring wells are summarized on Table 3.5.

Table 3.5: Groundwater Levels Observed in DS Monitoring Wells

Borehole	Surface Elevation (m)	Date of Observation	Water Level Depth (mbgs)	Water Level Elev. (m)	Notes
BH18-8	81.6	Sept. 26, 2018	2.8	78.8	Screened in overburden
BH18-12	83.2	Sept. 26, 2018	8.0	75.2	Screened in overburden
BH18-16	82.9	Sept. 26, 2018	2.7	80.2	Screened in overburden
BH18-19	80.7	Sept. 26, 2018	4.7	76.0	Screened in bedrock
BH18-29A*	77.5	Sept. 26, 2018	-	-	Screened in bedrock (Well not accessible)
BH18-32	77.2	Sept. 26, 2018	2.3	74.9	Screened in bedrock
BH18-37	81.3	Sept. 26, 2018	2.0	79.3	Screened in bedrock

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events.

4. FOUNDATIONS

It is understood that the 71.6-hectare Lakeview Village will include 5,000 to 7,000 new homes in a variety of housing options, including townhouses, mid-rise and high-rise buildings. The proposed structures will entail up to 3-levels of basement. The finished basement floor elevations are not available to us at the time of writing this report. It is assumed that P1, P2 and P3 basement levels will approximately be at 3m, 6m and 9m depths respectively below the existing grade. Footings will be 1m to 2m below the lowest basement slab.

Based on the encountered bedrock depths, the subject site is sub-divided into three areas (Area A, Area B and Area C), as summarized in Sections 3.1 to 3.3. The foundation recommendations for these three areas are provided below:

4.1 Proposed Buildings in Area 'A'

Boreholes drilled within Area 'A' (BH18-14, BH18-19, BH18-21, BH18-25, BH27 to BH18-38 and BH18-49) reported shale bedrock at depths ranging from 1.5 to 6.3m below the existing grade, corresponding to elevations ranging from 71.2 to 80.1m. Due to the shallow bedrock depths, this area is considered more suitable for high-rise development with one or more basement levels.

Depending upon the finished lowest basement floor elevation, the proposed buildings can be supported by conventional spread and strip footings / mat foundations or short drilled piers founded on shale bedrock, at minimum 0.3 m below the shale bedrock surface, for a bearing pressure values of 2.5 MPa at the Serviceability Limit States (SLS), and for a factored geotechnical resistance of 3.75 MPa at the Ultimate Limit States (ULS).

The footings/piers founded on sound shale, at minimum 1.5 m below the shale surface can be designed for a bearing pressure of 5.0 MPa at SLS, and a factored geotechnical resistance of 7.5 MPa at ULS.

The depths and elevations of shale bedrock at the borehole locations in Area 'A' are provided in Table 3.1 of this report.

4.2 Proposed Buildings in Area 'B'

Twenty-two (22) boreholes (BH18-1 to BH18-13, BH18-15 to BH18-18, BH18-20, BH18-39, BH18-40, BH18-46 & BH18-48) were drilled within Area 'B', to depths ranging from 11.1 to 48.3m.

There is a bedrock valley within Area 'B', with bedrock depths ranging from 9.1 to 48.1m below the existing grade, corresponding to elevations ranging from 34.7 to 71.3m. Therefore, this area is more suitable for low-rise to mid-rise development to be supported by shallow foundations (footings/raft) founded on undisturbed native soil.

Depending upon the location of the building and number of basement levels, it may be possible to support the proposed development in this area on footings or deep foundations such as caissons founded on bedrock.

Additional boreholes will be required to further delineate and confirm the bedrock depths if foundations are to be supported on bedrock.

Footings and/or raft founded on undisturbed native soils can be designed for a bearing capacity values of 300 to 500 kPa at SLS (serviceability limit states) and for a factored geotechnical resistance of 450 to

750 kPa at ULS (ultimate limit states). The bearing values and the corresponding founding elevations at the borehole locations are summarized on Table 4.2.

Table 4.2: Bearing Values and Founding Levels of Spread Footings

BH No.	Material	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth below Existing Ground (m)	Founding Level At or Below Elevation (m)	Notes/WL Elevation (m)
BH18-1	Silty clay Till/ Sandy Silt Till	500	750	3.4	79.4	during drilling WL at 76.7m
BH18-2	Clayey Silt Till	500	750	2.6	81.2	
BH18-3	Clayey Silt Till/ sandy silt to silty sand	500	750	1.0	80.4	during drilling WL at 76.8m
BH18-4	Sandy silt to silty sand	400	600	2.1	79.0	during drilling WL at 75.1m
BH18-5	Clayey Silt Till	500	750	2.6	81.4	
BH18-6	Clayey Silt Till	500	750	1.8	81.0	
BH18-7	Clayey Silt Till	500	750	1.5	80.6	
BH18-8	Clayey Silt/sandy silt	400	600	1.1	80.5	WL at 78.8m on Sept. 26/18
BH18-9	Clayey Silt/sandy silt	300 500	450 750	2.3 6.1	77.9 74.1	during drilling WL at 77.1m
BH18-10	Clayey Silt Till/clayey silt/sandy silt till	500	750	1.8	80.5	during drilling WL at 76.5m
BH18-11	Clayey Silt Till Silty Clay	500 300	750 450	3.4 13.0	81.7 72.1	
BH18-12	Clayey Silt Till Clayey Silt	500 300	750 450	3.0 8.0	80.2 75.2	WL at 75.2m on Sept. 26/18
BH18-13	Clayey Silt Till/Clayey Silt/Sandy silt to silty sand till	300 500	450 750	1.8 4.6	78.4 75.6	during drilling WL at 75.6m; methane gas encountered at 11m
BH18-15	Silt/silty sand/silty clay	500	750	3.1	77.3	
BH18-16	Clayey silt till	500	750	2.6	80.3	WL at 80.2m on Sept. 26/18
BH18-17	Clayey Silt Till/Clayey Silt	500	750	1.8	78.5	
BH18-18	Clayey silt till Silty clay/silt	300	450	2.1	79.0	
BH18-20	Clayey silt till/silty clay/silt to clayey silt	500	750	1.0	79.3	during drilling WL at 77.2m
BH18-39	Sandy silt till/silty clay till	500	750	3.4	78.4	
BH18-40	Sandy Silt to silty sand/silty clay till	500	750	2.5	79.3	during drilling WL at 79.5m
BH18-46	Silty clay till	500	750	1.1	80.3	

BH18-48	Clayey silt till/sandy silt till	500	750	1.8	79.3	during drilling WL at 78.0m

4.3 Proposed Buildings in Area 'C'

Boreholes drilled in Area 'C' (BH18-41 to BH18-45 and BH18-47) reported shale bedrock depths ranging from 3.1 to 7.6m below the existing grade, corresponding to elevations ranging from 75.7 to 80.4m. Due to the shallow bedrock depths, this area is also suitable for high-rise development with one or more basement levels.

Depending upon the finished lowest basement floor elevation, the proposed buildings can be supported by conventional spread and strip footings / mat foundations or short drilled piers founded on shale bedrock, at minimum 0.3 m below the shale bedrock surface, for a bearing pressure values of 2.5 MPa at the Serviceability Limit States (SLS), and for a factored geotechnical resistance of 3.75 MPa at the Ultimate Limit States (ULS).

The footings/piers founded on sound shale, at minimum 1.5 m below the shale surface can be designed for a bearing pressure of 5.0 MPa at SLS, and a factored geotechnical resistance of 7.5 MPa at ULS.

The depths and elevations of shale bedrock at the borehole locations are provided in Table 3.3 of this report.

Footings and/or raft founded on undisturbed native soils can be designed for a bearing capacity values of 300 to 500 kPa at SLS (serviceability limit states) and for a factored geotechnical resistance of 450 to 750 kPa at ULS (ultimate limit states). The bearing values and the corresponding founding elevations at the borehole locations are summarized on Table 4.3.

Table 4.3: Bearing Values and Founding Levels of Spread Footings

BH No.	Material	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth below Existing Ground (m)	Founding Level At or Below Elevation (m)	Notes/WL Elevation (m)
BH18-41	Silty clay Till/ silt	500	750	2.6	80.7	during drilling WL at 78.7m
BH18-42	Clayey Silt Till	500	750	4.6	81.1	
BH18-43	Clayey Silt Till	500	750	1.1	82.4	
BH18-44	Clayey Silt Till	300	450	1.5	82.4	
BH18-45	Silty Clay Till	400	600	2.6	80.7	
BH18-47	Clayey Silt Till / Silt/sandy silt to silty sand	300	450	1.0	81.4	during drilling WL at 77.8m

4.4 Other Comments on Foundations

Foundations designed to the specified bearing capacity at the serviceability limit states (SLS) are expected to settle less than 25 mm total and 19 mm differential.

Where it is necessary to place footings at different levels in soil, the upper footing must be founded below an imaginary 10 horizontal to 7 vertical line drawn up from the base of the lower footing. Where it is necessary to place footings at different levels on bedrock, the upper footing must be founded below an imaginary 1 horizontal to 1 vertical line (1H:1V in bedrock) drawn up from the base of the lower footing. The lower footing must be installed first to help minimize the risk of undermining the upper footing.

All foundation bases must be inspected by this office prior to pouring concrete.

The shale bedrock weathers rapidly between wetting and drying cycles. In view of this, it is suggested that a lean concrete mat slab be placed immediately after the excavation is complete to keep the shale intact, unless the footings are cast immediately after excavating.

The inspected and approved footing base should be covered with 50 mm thick mud slab immediately in order to avoid disturbance of the founding soil due to construction activity and weathering /drying.

It should be noted that the recommended bearing capacities have been calculated by DS Consultants Limited from the borehole information for the preliminary design stage only. Additional boreholes may be required when the final building plans are available. The investigation and comments are necessarily on-going as new information of the underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections provided by DS Consultants Limited to validate the information for use during the construction stage.

5. FROST PROTECTION

All foundations exposed to seasonal freezing conditions must have at least 1.2m of soil cover for frost protection.

There is no official rule governing the required founding depth for footings below unheated basement floors. Certainly, it will not be greater than the 1.2 m required in Southern Ontario for exterior footings. Un-monitored experience indicates that a shallower depth ranging from 0.82 to 0.9 m for interior column footings and 0.4 m for wall footings has been successful where 2 or more basement levels apply. The 0.82 m depth is believed to be close to the minimum structural requirement for interior column footings. Adjacent to air shafts and entrance and exit doors, a footing depth of 1.2 m below floor level is required or, alternatively, insulation protection must be provided.

It is also emphasized that underfloor drainage and/or an adequate free draining gravel base is required to minimize the risk of floor dampness. Floor dampness could lead to temporary icing and the risk of accidents.

6. FLOOR SLAB AND PERMANENT DRAINAGE

The floor slab can be supported on grade provided all existing fill material and disturbed soils are removed and the base thoroughly proof rolled. The fill required to raise the grade can consist of inorganic soil, placed in shallow lifts and compacted to 98 percent of Standard Proctor Maximum Dry Density (SPMDD). A moisture barrier consisting of at least 200 mm of 19 mm clear crushed stone should be installed under the floor slab.

In the area where shale bedrock is encountered at floor slab level, the floor slab can be cast as slab-on-grade, provided a 200 mm layer of clear crushed stone (19 mm maximum size) is placed between the underside of the floor slab and the exposed bedrock surface.

A perimeter and underfloor drainage system will be required for buildings with basements. Typical drainage and backfill recommendations are illustrated on Drawings 60 to 62 for the open cut and shored excavation system.

7. ELEVATOR AND SUMP PITS

If elevator/sump pits are to be installed in cohesionless soils (sandy silt, sand, silt) below the water table, drainage systems at the base level of the pits are not recommended, due to the concern of loss of fines. In this case, the pits can be designed as water-tight structures, and water pressure on the pit walls and the pit base slab should be considered.

8. EARTH, ROCK AND WATER PRESSURES

The design of basement walls can incorporate the conventional design in the overburden using the earth pressure coefficient K_1=0.40. In the rock, the earth pressure coefficient K can be reduced to K_2=0.20.

The lateral earth/rock pressure acting at any depth on basement walls can be calculated as follows:

In soil: $p = K_1 (\gamma_1 h_1 + q) + p_w$

In rock: $p = K_2 (\gamma_1 H_1 + q + \gamma_2 h_2) + p_w$

where p = lateral earth and water pressure in kPa acting at depth h_1 or h_2

K_1, K_2 = earth pressure coefficients, K_1=0.40 for overburden soil; K_2=0.20 for rock

γ_1 = unit weight of overburden soil, assuming 20.5 kN/m^3 above the water table and 11 kN/m^3 below the water table

γ_2 = unit weight of rock below water, assuming 15 kN/m^3

h_1 = Depth in overburden soil, below ground surface

H_1 = thickness of soil above rock

h_2 = Depth in rock, below rock surface

q = value of surcharge in kPa

p_w = hydrostatic water pressure

When the foundation wall is poured against the caisson wall, the foundation wall as well as the caisson wall should be designed for hydrostatic pressure, even though a drainage board is provided between the basement wall and the caisson wall.

9. EXCAVATIONS AND GROUNDWATER CONTROL

Excavations can be carried out with heavy hydraulic backhoe. Long-term (stabilized) groundwater levels in the monitoring wells were found at depths ranging from 2.0 to 8.0m below the existing grade, corresponding to Elevations of 74.9 to 80.2m. Positive dewatering will be required prior to any excavation in water bearing cohesionless soils below the groundwater table, otherwise it will result in an unstable base and flowing sides. A contractor specializing in dewatering should be retained to design the dewatering systems for excavations below the groundwater table.

Further comments on groundwater control during construction and permanent drainage are provided in our preliminary hydrogeology report.

It should be noted that the glacial till soils may contain boulders. Large obstructions in the fill material are anticipated. Provisions must be made in the excavation contract for the removal of boulders in the till and large obstructions in the fill material.

Excavation of the shale can be carried out using heaviest available single tooth ripper equipment. The limestone beds are present and may overly the shale bedrock surface at some locations. It may be necessary at some locations to utilize jackhammer type equipment to “open” the limestone layers for the ripper.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the fill material can be classified as Type 3 soil above the groundwater table. The very stiff to hard clayey soils can be classified as Type 2 Soil above the groundwater table and as Type 3 below the groundwater table. The cohesionless soils of sand and silty sand can be classified as Type 3 Soil above the groundwater table and Type 4 soil below the groundwater table.

The native soils free from topsoil and organics can be used as general construction backfill, provided its moisture content is within 2 percent of the optimum moisture content. Loose lifts of soil, which are to be compacted, should not exceed 200 mm. Depending on the time of construction and weather, some excavated material may be too wet to compact and will require aeration prior to its use.

Imported granular fill, which can be compacted with hand held equipment, should be used in confined areas. The excavated soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular B should be used.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should be compacted at the surface or be covered with tarpaulins to minimize moisture uptake.

10. EARTHQUAKE CONSIDERATIONS

Based on the existing borehole information and according to Table 4.1.8.4.A of OBC 2012, the subject site for the proposed development can be classified as “Class C” for seismic site response.

In Area ‘A’ and Area ‘B’, for the proposed buildings with one or more levels of basement, founded on sound shale bedrock, it may be possible to classify the site as “Class B” for seismic site response. This should be further confirmed during the detail design stage.

11. ROADS

The proposed development will be serviced by a network of roads.

11.1 Pavement Thickness

The investigation has shown that the predominant subgrade soil, after stripping the topsoil and any other organic and otherwise unsuitable subsoil, will generally consist of clayey silt till, clayey silt, clayey silt till shale complex and shale bedrock.

Based on the above and assuming that traffic usage will be residential/commercial for local and collector road, the following minimum pavement thicknesses are recommended for roads to be constructed within the development.

Collector Road

40 mm HL3 Asphaltic Concrete
85 mm HL8 Asphaltic Concrete
200 mm Granular ‘A’
325 mm Granular ‘B’

Local/Minor Local Road

40 mm HL3 Asphaltic Concrete
85 mm HL8 Asphaltic Concrete
200 mm Granular 'A'
175 mm Granular 'B'

These values may need to be adjusted according to the City of Mississauga Standards. The site subgrade and weather conditions (i.e. if wet) at the time of construction may necessitate the placement of thicker granular sub-base layer in order to facilitate the construction. Furthermore, heavy construction equipment may have to be kept off the newly constructed roads before the placement of asphalt and/or immediately thereafter, to avoid damaging the weak subgrade by heavy truck traffic.

11.2 Stripping, Sub-excavation and Grading

The site should be stripped of all topsoil and any organic, weathered or otherwise unsuitable soils to the full depth of the roads, both in cut and fill areas. Following stripping, the site should be graded to the subgrade level and approved. The subgrade should then be proof-rolled, in the presence of the Geotechnical Engineer, by at least several passes of a heavy compactor having a rated capacity of at least 8 tonnes. Any soft spots thus exposed should be removed and replaced by select fill material, similar to the existing subgrade soil and approved by the Geotechnical Engineer. The subgrade should then be re-compacted from the surface to at least 98% of its Standard Proctor Maximum Dry Density (SPMDD). The final subgrade should be cambered or otherwise shaped properly to facilitate rapid drainage and to prevent the formation of local depressions in which water could accumulate.

Owing to the clayey (i.e. impervious) nature of some subsoils at the site, proper cambering and allowing the water to escape towards the sides (where it can be removed by means of subdrains) is considered to be beneficial for this project. Otherwise, any water collected in the granular sub-base materials could be trapped thus causing problems due to softened subgrade, differential frost heave, etc. For the same reason damaging the subgrade during and after placement of the granular materials by heavy construction traffic should be avoided. If the moisture content of the local material cannot be maintained at ±2% of the optimum moisture content, imported granular material may need to be used.

Any fill required for re-grading the site or backfill should be select, clean material, free of topsoil, organic or other foreign and unsuitable matter. The fill should be placed in thin layers and compacted to at least 95% of its SPMDD. The degree of compaction should be increased to 98% within the top 1.0 m of the subgrade, or as per City Standards. The compaction of the new fill should be checked by frequent field density tests.

11.3 Construction

Once the subgrade has been inspected and approved, the granular base and sub-base course materials should be placed in layers not exceeding 200 mm (uncompacted thickness) and should be compacted to at least 100% of their respective SPMDD. The grading of the material should conform to current OPS Specifications.

The placing, spreading and rolling of the asphalt should be in accordance with OPS Specifications or, as required by the local authorities.

Frequent field density tests should be carried out on both the asphalt and granular base and sub-base materials to ensure that the required degree of compaction is achieved.

11.4 Drainage

The City of Mississauga may require the installation of full-length subdrains on all roads. The subdrains should be properly filtered to prevent the loss of (and clogging by) soil fines.

All paved surfaces should be sloped to provide satisfactory drainage towards catch-basins. As discussed in Section 11.2, by means of good planning any water trapped in the granular sub-base materials should be drained rapidly towards subdrains or other interceptors.

12. UNDERGROUND UTILITIES

It is understood that underground services (watermains, storm and sanitary sewer) will be installed at the site to service the proposed development. Based on the preliminary servicing plans prepared by Urbantech, invert levels of the proposed utilities will be about 2 to 6m below the existing grade, with sanitary sewer at the deepest point at about 6m below the existing grade.

Trenches will be dug through fill materials followed by native soils of cohesive and cohesionless nature. Long-term (stabilized) groundwater levels in the monitoring wells were found at depths ranging from 2.0 to 8.0m below the existing grade, corresponding to Elevations of 74.9 to 80.2m. Positive dewatering will be required prior to any excavation in water bearing cohesionless soils below the groundwater table, otherwise it will result in an unstable base and flowing sides. Water table must be lowered to at least 1m below the lowest excavation level.

Detailed comments on excavation and groundwater control are provided in Section 9.

The undisturbed native soils encountered in the boreholes will provide adequate support for the service pipes and allow the use of Class B type bedding. The recommended minimum thickness of granular bedding below the invert of the pipes is 150 mm. The thickness of the bedding may, however, have to be increased depending on the pipe diameter or in accordance with local standards or if wet or weak

subgrade conditions are encountered, especially when the soil at the trench base level consists of wet, dilatant silt.

The bedding material should conform to City of Mississauga bedding stone gradation requirements. Where the bedding falls below the anticipated water table, the bedding stone must be surrounded with a geotextile filter cloth.

For deep trenches, i.e. more than 2.0 m below the shale surface, a minimum 50 mm thick polystyrene etc. layer will be required at both sides of the pipe to avoid rock squeezing. The polystyrene layer should extend vertically to at least 0.3 m above the pipe. The rock trench should be wide enough so that at each side, the horizontal distance between the pipe side and the cut rock surface is at least 0.3 m.

The select inorganic fill materials or native soils free from topsoil / organics can be used as general construction backfill, provided their moisture contents at the time of construction are within 2% of their optimum moisture content.

In any case the degree of compaction of the trench backfill should be at least 95% of the material's Standard Proctor Maximum Dry Density (SPMDD). This value should be increased to at least 98% within 2 m of the road surface. The granular pavement sub-base and base materials should be compacted to at least 100% of their respective SPMDD.

13. GENERAL COMMENTS AND LIMITATIONS OF REPORT

This geotechnical report is preliminary, prepared based on the conceptual design plans. Additional boreholes will be required, once the detailed development plans are available to confirm the findings and recommendations provided in this report.

This report is intended solely for the client named. The material in it reflects our best judgment in light of the information available to DS Consultants Ltd at the time of preparation. Unless otherwise agreed in writing by DS Consultants Ltd, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the borehole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the borehole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

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

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. DS Consultants Ltd accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

DS CONSULTANTS LTD



Alka Sangar, M.Eng., P.Eng.



Fanyu Zhu, Ph.D., P.Eng.

Drawings

J:\-GIS\18-519-10 800 Hydro Road, Mississuaga\1-QGIS\Geotechnical\Figure 1- BH Location Plan.qgs



Image Source: Imagery @2018 Google

Legend:

Boreholes

- Monitoring Well
- Borehole
- Area 'A' Bedrock depth 1.5 to 4.6m
- Area 'B' Bedrock depth 9.1 to 48.1m
- Area 'C' Bedrock depth 3.1 to 76m

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Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
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Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Project: GEOTECHNICAL INVESTIGATION

Title: **BOREHOLE LOCATION PLAN**

Approved By:	Drawn By:	Date:
N.W	S.Y	October 2018
Scale: As Shown	**Project No.:** 18-519-10	**Figure No.:** 1

C:\0Sharon\18-519-10 800 Hydro Road, Mississuaga\1-QGIS\Geotechnical\Figure 1- BH Location Plan-Only 2018.qgs Jun-08 17:08



Legend

- Approx_Site_bnd
- Monitoring Well (2018)
- Borehole (2018)

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Client: ARGO DEVELOPMENT CORPORATION

Project: PROPOSED GEOTECHNICAL INVESTIGATION - PHASE 1 AREA
Lakeview Development, 800 Hydro Road, Toronto, ON

Title: **BOREHOLE LOCATION PLAN**

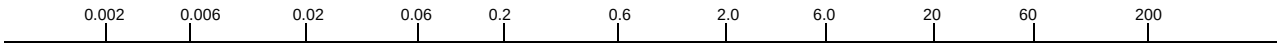
Size:	Approved By:	Drawn By:	Date:
11 x 17	N.W	S.Y	June 2020
Rev. 0	Scale: As Shown	Project No.: 18-519-10	Drawing No.: **1A**
	Image/Map Source: *CAD Drawing*		

Drawing 1B: Notes On Sample Descriptions

1. All sample descriptions included in this report generally follow the Unified Soil Classification. Laboratory grain size analyses provided by DSCL also follow the same system. Different classification systems may be used by others, such as the system by the International Society for Soil Mechanics and Foundation Engineering (ISSMFE). Please note that, with the exception of those samples where a grain size analysis and/or Atterberg Limits testing have been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		



EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional preliminary geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

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LOG OF BOREHOLE BH18-01

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-18-2018

REF. NO.: 18-519-10
ENCL NO.: 2

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
82.8							
0.0 / 82.4	**TOPSOIL:**350mm		1	SS	14		
0.4 / 82.1	**FILL:** clayey silt, some organics, trace gravel, grey, moist, stiff		2	SS	8		
1			3	SS	10		
2 / 80.5							
2.3 / 80.2	**FILL:** sandy silt, some organics, grey, moist, loose		4	SS	8		
3 / 79.7							
3.1 / 79.4	**SILTY CLAY TILL:** some sand, trace gravel, brown, moist, very stiff		5	SS	17		
4 / 78.2							
4.6 / 78.0	**SANDY SILT TILL:** trace to some clay, trace gravel, grey, moist, very dense		6	SS	50		
5 / 6 / 76.7						▽	
6.1 / 76.5	**SAND:** trace silt, brown, wet, dense		7	SS	45		
7 / 75.2							
7.6 / 74.7	**SAND AND GRAVEL:** trace silt, brown, wet, very dense		8	SS	50		
8 / 9 / 73.7							
9.1 / 73.4	**SILTY SAND TILL:** some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense		9	SS	78		
10							

W. L. 76.7 m during drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
225		1 15 47 37

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-01

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-18-2018

REF. NO.: 18-519-10
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY SAND TILL: some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense(Continued)										
11			10	SS	50		72		○		
12	wet below 12.2 m		11	SS	76		71		○		
70.0							70				
12.8	**END OF BOREHOLE** Notes: 1) Water level at 6.1 mbgl during drilling										

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-02

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-19-2018

REF. NO.: 18-519-10
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.8												
83.7	**ASPHALT:** 100 mm											
0.1 / 83.4	**SAND AND GARVEL:** 250 mm		1	AS								
0.4 / 83.0	**FILL:** silty sand, trace gravel, grey, wet						83					
1 0.8 / 82.3	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff		2	SS	22							
1.5 / 81.5	**SILTY SAND:** trace clay, brown, wet, dense		3	SS	40		82					0 72 22 6
2.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, grey, moist, very stiff to hard		4	SS	46		81			225		
			5	SS	40		80			225		
			6	SS	28		79			225		1 49 33 17
			7	SS	41		78			225		
			8	SS	70		77			225		
			9	SS	44		76			225		
							75	wet spoon				July 19, 2018
							74					---------- July 20, 2018

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-02

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-19-2018

REF. NO.: 18-519-10
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, grey, moist, very stiff to hard(Continued)											
11			10	SS	21		73		○	225		
12			11	SS	40		72		○			
13							71					
70.1												
13.7	**CLAYEY SILT:** trace sand, grey, moist, very stiff		12	SS	21		70		○	225		
15			13	SS	19		69		○	225		
16							68					
17			14	SS	18		67		○	225		
18	stiff at 18.3 m						66					
			15	SS	19		65		○	225		
19												
20							64					

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ $^{\varepsilon}$=3% Strain at Failure

LOG OF BOREHOLE BH18-02

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-19-2018

REF. NO.: 18-519-10
ENCL NO.: 3

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
63.4	**CLAYEY SILT:** trace sand, grey, moist, very stiff(Continued)		16	SS	18				○	225	
20.4	**END OF BOREHOLE** Notes: 1) Borehole dry upon completion										

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.4										
0.0 / 81.0	**TOPSOIL:** 350mm		1	SS	13		81			
0.4 / 80.6	**POSSIBLE FILL:** clayey silt, brown, moist, stiff									
0.8 / 79.7	**CLAYEY SILT:**some sand, occassional sand seams, brown, moist, very stiff to hard		2	SS	22		80	>225		
1.7 / 78.3	**CLAYEY SILT TILL :** some sand, trace gravel, occassional sand seams, brown, moist, very stiff		3	SS	33		79	>225		
			4	SS	24					
3.1	**SANDY SILT TO SILTY SAND** trace clay, trace gravel, brown, moist to wet , very dense		5	SS	50/ 100mm		78			
	grey, wet below 4.6 m		6	SS	50/ 100mm	▽ W. L. 76.8 m during drilling	77			
73.8			7	SS	80		76			
7.6 / 72.3	**SILTY SAND TO SAND:** trace clay, grey, wet, dense		8	SS	46		75			
9.1	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense		9	SS	50/ 150mm		74			
							73			
							72			

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
70.7	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense(Continued)						71					
10.7	**SAND:** trace silt, grey, wet, dense to very dense		10	SS	42							0 95 (5)
							70					
			11	SS	64		69					
67.7												
13.7	**SANDY SILT TO SILTY SAND:** trace to some clay, some gravel, grey, wet, very dense		12	SS	80		68					
			13	SS	50/ 150mm		67					
			14	SS	50/ 75mm		66					
							65					
63.1							64					
18.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasssional cobble/boulders, grey, moist, hard		15	SS	50/ 150mm		63					
							62					

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GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
61.2			16	SS	92				>225		
20.2	**END OF BOREHOLE** Notes: 1) Water level at 4.6 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ $^{\varepsilon}$=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
81.1 / 0.0	**TOPSOIL:** 150mm					81
81.0 / 0.1	**FILL:** silty sand and gravel, brown, moist, compact	1	SS	10		
80.3 / 0.8	**FILL:** silt to clayey silt, trace organics, trace gravel, grey, moist, compact	2	SS	12		80
79.3 / 1.8	**CLAYEY SILT TILL:** sandy, trace gravel, trace cobble, brown, moist, very stiff	3	SS	14		79
78.8 / 2.3	**SANDY SILT TO SILTY SAND:** trace clay, trace to some gravel, brown, moist to wet, very dense to compact	4	SS	29		78
		5	SS	50/ 150mm		77
		6	SS	50/ 50mm		76
	grey and wet below 6.1 m	7	SS	25	▽	74
73.5 / 7.6	**SILTY SAND TILL:** trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense	8	SS	78		73
		9	SS	64		72

W. L. 75.1 m during drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
	SILTY SAND TILL: trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense(Continued)						71
11			10	SS	hammer bounced		70
12			11	SS	50/ 125mm		69
13							68
67.4							
13.7	**SAND:** trace silt, grey, wet, very dense		12	SS	62		67
15	interbed of silt at 15.5 m		13	SS	53		66
16							65
17			14	SS	80		64
18							
62.9							63
18.2	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, hard		15	SS	56		
19							62
20							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

>225 (POCKET PEN.)

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
60.7	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, hard(Continued)		16	SS	42		61			>225	
20.4	**END OF BOREHOLE** Notes: 1) Water level at 6.0 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

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LOG OF BOREHOLE BH18-05

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
84.0							
83.9 0.1	**TOPSOIL:** 127mm						
	FILL: clayey silt, trace rootlet, trace organic, brown, moist, stiff to hard		1	SS	22		
			2	SS	11		83
			3	SS	50		82
81.7 2.3	**CLAYEY SILT TILL:** some sand, trace gravel, occassional cobble/boulder, brown to grey, moist, hard		4	SS	45		
			5	SS	69		81
	grey below 4.9 m		6	SS	93		80
			7	SS	58		79
			8	SS	60		78
			9	SS	39		77
							76
							75

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3%: Strain at Failure

LOG OF BOREHOLE BH18-05

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
	CLAYEY SILT TILL: some sand, trace gravel, occassional cobble/boulder, brown to grey, moist, hard(Continued)						
			10	SS	51		73
71.8							72
12.2	**SILTY CLAY:** trace sand, grey, moist, hard to very stiff		11	SS	32		
			12	SS	19		71
68.8							70
15.2	**CLAYEY SILT:** trace sand, grey, moist, very stiff		13	SS	21		69
			14	SS	19		68
65.7							67
18.3	**SILT:** trace clay, trace sand, grey, wet, compact		15	SS	26		66
64.5							65
19.5	**SANDY SILT TO SILTY SAND TILL :** interbed of wet sand, grey, wet, very dense						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-05

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 6

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
63.6			16	SS	66				○		
20.4	**END OF BOREHOLE** Notes: 1) Water level at 18.3 mbgl upon completion.										

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.8												
0.0 / 82.8	**TOPSOIL:** 230 mm											
0.2 / 82.0	**FILL:** sand and gravel, brown, moist, compact		1	SS	13							
0.8 / 81.3	**FILL:** silty clay, trace gravel, brown, moist, compact		2	SS	13		82			>225		
1.5	**CLAYEY SILT TILL:** some sand to sandy trace gravel, brown, moist, hard		3	SS	28		81			>225		
			4	SS	44		80			>225		
	grey below 3.1 m		5	SS	34		79			>225		
			6	SS	40		78			>225		
			7	SS	51		77					
			8	SS	54		76			>225		
			9	SS	54		75			>225		
							74					
							73					

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GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	ELEVATION
11	**CLAYEY SILT TILL:** some sand to sandy trace gravel, brown, moist, hard(Continued)	10	SS	54	72
12		11	SS	64	71
13					70
69.1					
13.7	**SILTY CLAY:** trace sand, occasional sand seams, grey, moist, very stiff	12	SS	16	69
14					
15		13	SS	26	68
16					67
66.0					
16.8	**CLAYEY SILT TO SILT :** some clay, trace sand, grey, moist, compact	14	SS	23	66
17					
18		15	SS	26	65
19					64
20					63

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa): >225, >225, 48, 125, 200, 200, >225
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL
0 6 26 68

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
	CLAYEY SILT TO SILT : some clay, trace sand, grey, moist, compact(Continued)	16	SS	23	
		17	SS	28	
59.9					
22.9	**SILT:**some clay, grey, very moist to wet, dense	18	SS	32	
58.4					
24.4	**SAND:**trace silt, some gravel to gravelly, grey, wet, very dense	19	SS	81	
		20	SS	87	
55.4					
27.4	**SANDY SILT TO SILTY SAND:**trace clay, grey, wet, very dense	21	SS	58	
54.8					
28.0	**SILTY CLAY:**trace sand, trace gravel, grey, moist, hard	22	SS	81	
52.8					

SOIL PROFILE | SAMPLES | GROUND WATER CONDITIONS | ELEVATION

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED
● QUICK TRIAXIAL
+ FIELD VANE & Sensitivity
× LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa): 200 (CLAYEY SILT TO SILT); 200 (SILT); >225 (SILTY CLAY)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
30.0	**SILT:** some clay, trace sand, grey, wet, dense						
			23	SS	45		52
31 51.8							
31.0	**SAND:**trace silt, grey, wet, dense						
32 50.8							51
32.0	**SAND AND GRAVEL:**trace silt, occassional cobble/boulders, grey, wet, very dense		24	SS	80		
33							50
			25	SS	87		49
34							
35			26	SS	50/ 125mm		48
36							47
			27	SS	76		46
37							
38			28	SS	50/ 150mm		45
39							44
40			29	SS	80		43

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3% Strain at Failure

LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
41	**SAND AND GRAVEL:** trace silt, occassional cobble/boulders, grey, wet, very dense (Continued)						42					
			30	SS	50/ 100mm							
42							41					
			31	SS	50/ 125mm		40					
43												
44							39					
			32	SS	50/ 100mm							
45							38					
			33	SS	50/ 100mm		37					
46												
47			34	SS	100/ 75mm		36					
48	34.7											
	48.1 34.5 **SHALE:** Georgian Bay Formation, weathered, grey		35	SS	100/ 50mm		35					
	48.3 **END OF BOREHOLE:**											

Notes:
1) Water level at 16.8m during drilling.

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ $^{\varepsilon}$=3% Strain at Failure

LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
82.1						
0.0 / 81.8	**GRANULAR BASE:** 300mm					82
0.3	**FILL:** sand, some gravel, grey, moist, compact	1	AS			
1 / 81.0		2	SS	16		81
1.1	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, brown to grey, moist, very stiff to hard	3	SS	33		
2		4	SS	79		80
3	grey below 3.1 m	5	SS	59		79
4						78
5		6	SS	58		77
6						76
74.5		7	SS	51	▽	
7.6	**SANDY SILT TILL:**some clay, some gravel, occasional cobble/boulder, grey, very moist to wet, very dense	8	SS	87	W. L. 74.5 m during drilling	75
8						74
9 / 73.0						
9.1	**SILT:** trace sand, grey, moist to very moist, compact	9	SS	29		73
10						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
>225
>225
>225
>225
>225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
71.4	**SILT:** trace sand, grey, moist to very moist, compact(Continued)						72				
10.7	**SANDY SILT TO SILTY SAND:** trace gravel, grey, wet, very dense		10	SS	77		71		○		
70.0							70				
12.1	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble/boulder, grey, moist, hard		11	SS	59		69		○	>225	
			12	SS	59		68		○	>225	2 27 48 23
66.9							67				
15.2	**SANDY SILT TO SILTY SAND:** trace clay, grey, wet, very dense		13	SS	79		66		○		
65.3							65		○	>225	
16.8	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, occasional cobble/boulder, grey, moist, hard		14	SS	72		64		○	>225	
			15	SS	40		63		○	>225	
62.3											
19.8											

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ $^{\varepsilon}$=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY: trace sand, grey, moist, hard(Continued)		16	SS	39		62	200		
							61			
			17	SS	34			175		
							60			
			18	SS	56		59	>225		
							58			
			19	SS	52			>225		
							57			
			20	SS	57		56	>225		
							55			
			21	SS	50/ 25mm			>225		
53.1							54			
29.0	**SANDY SILT TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense						53			

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SANDY SILT TILL: trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense(Continued)						52				
51.4			22	SS	50/ 100mm				○		
30.7	**END OF BOREHOLE** Notes: 1) Water level at 7.6m during drilling.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ $^{\varepsilon}$=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-08

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 9

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.6							
0.0 / 80.8	**FILL:** sand and gravel, brown, wet, compact	1	SS	17		81	
0.8	**CLAYEY SILT :** trace sand, brown to grey, moist, very stiff to hard	2	SS	16			
		3	SS	20		80	
	grey below 2.3 m	4	SS	28	▽	79	
							W. L. 78.8 m Sep 26, 2018
		5	SS	32		78	
76.7						77	
4.9	**SAND & SILT:** trace to some clay, grey, wet, compact to dense	6	SS	24			
						76	
							Bentonite
		7	SS	46		75	0 43 47 10
74.0						74	
7.6	**SANDY SILT:** trace clay, grey, wet, very dense	8	SS	66			0 31 62 7
72.5						73	
9.1	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, occasional cobble/boulder, grey, moist, hard	9	SS	71		72	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-08

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 9

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
70.9	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, occasional cobble/boulder, grey, moist, hard(Continued)				
10.7	**SILT TO CLAYEY SILT:** trace sand, grey, moist to very moist, dense	10	SS	34	71
69.4					70
12.2	**SILTY SAND TILL:** trace clay, some gravel, grey, wet, very dense	11	SS	50/ 150mm	69
68.1					68
13.5	**SAND:** trace silt, trace gravel, grey, wet, very dense	12	SS	74	67
66.4					
15.2	**SANDY SILT TO SILTY SAND:** trace clay, grey, wet, very dense	13	SS	82	66
64.5					65
17.1	**SILTY CLAY:** trace sand, grey, moist, hard	14	SS	71	64
		15	SS	50	63
					62

Filter pack
Slotted Pipe
Bentonite

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED
● QUICK TRIAXIAL
+ FIELD VANE & Sensitivity
× LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
175
>225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL
8 88 (4)

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-08

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 9

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
61.2	**SILTY CLAY:** trace sand, grey, moist, hard(Continued)		16	SS	35				○	>225	
20.4	**END OF BOREHOLE** Notes: 1) Water level at 4.9 mbgl during drilling 2) Water level in the monitoring well recorded at 2.8m on Sept. 26, 2018.										

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ $^{\varepsilon_f}$=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-09

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 19

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.2												
0.0	**FILL:** sandy silt, trace gravel, grey, moist		1	AS			80		○			
79.4												
0.8	**FILL:** silty clay, trace organics, grey, moist, loose		2	SS	4		79		○			
78.7												
1.5	**CLAYEY SILT:** trace sand, grey, moist, firm to very stiff		3	SS	6				○			
			4	SS	20		78		○	>225		
77.1						▽						
3.1	**SANDY SILT:** trace to some clay, grey, wet, compact		5	SS	22		W. L. 77.1 m during drilling		○			4 33 53 10
			6	SS	30		76		○			
74.1							75					
6.1	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, hard		7	SS	75		74		○	>225		
72.6							73					
7.6	**SILT TO SANDY SILT:** trace clay, grey, wet, very dense		8	SS	81		72		○			
			9	SS	50/ 125mm		71		○			

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8 ε=3% Strain at Failure

LOG OF BOREHOLE BH18-09

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 19

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT TO SANDY SILT: trace clay, grey, wet, very dense(Continued)						70				
69.5											
10.7	**SILTY CLAY:** trace sand, trace gravel, grey, moist, hard		10	SS	32			○		>225	
11							69				
12			11	SS	53		68	○		>225	
13											
66.5							67				
13.7	**SILT:** trace to some clay, trace sand, grey, wet, dense		12	SS	34			○			
14							66				
15											
65.0							65				
65.2	**SHALE:** Georgian Bay Formation,		13	SS	50/			○			
15.3	weathered, grey				100mm						
	END OF BOREHOLE										
	Notes:										
	1) Water level at 3.1 mbgl during drilling.										

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ $^{\varepsilon_f}$=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-10

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-25-2018

REF. NO.: 18-519-10
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
82.3					
0.0 / 82.0	**TOPSOIL:** 300 mm				
0.3 / 81.5	**FILL:** silty clay, trace topsoil, trace gravel, brown, wet, stiff	1	SS	14	82
0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard	2	SS	19	
		3	SS	50	81
		4	SS	45	
		5	SS	30	80
77.7					
4.6 / 76.2	**CLAYEY SILT:** trace sand, grey, moist, very stiff	6	SS	20	79
6.1 / 74.7	**SILT:** trace clay, trace to some sand, grey, wet, compact	7	SS	23	78
7.6	**SANDY SILT TILL:** some clay, frequent seams of wet sand, trace gravel, occassional cobbe/boulders, grey, moist, very dense	8	SS	54	77
		9	SS	73	76
					75
					74
					73

GROUND WATER CONDITIONS: ▽ W. L. 76.5 m during drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa): 200; >225; >225; >225; 225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-10

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-25-2018

REF. NO.: 18-519-10
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	ELEVATION
70.1	**SANDY SILT TILL:** some clay, frequent seams of wet sand, trace gravel, occassional cobbe/boulders, grey, moist, very dense(Continued)		10	SS	50	72
						71
12.2	**SILTY CLAY:** trace sand, grey, moist, very stiff		11	SS	27	70
			12	SS	28	69
			13	SS	30	68
			14	SS	24	67
64.0						66
18.3	**SAND AND GRAVEL:** trace silt, grey, saturated, very dense		15	SS	76	65
						64
62.3			16	SS	50/	63

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
GROUND WATER CONDITIONS

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-10

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-25-2018

REF. NO.: 18-519-10
ENCL NO.: 11

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"							GR SA SI CL
20.0	**END OF BOREHOLE** Notes: 1) Water level at 5.8 mbgl during drilling				150mm							

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-11

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-20-2018

REF. NO.: 18-519-10
ENCL NO.: 12

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
85.1										
0.0 / 84.9	**TOPSOIL:** 250 mm						85			
0.2 / 84.3	**FILL:** clayey silt, mixed with topsoil, trace gravel, grey, moist, compact		1	SS	18					
0.8	**FILL:** silty clay, trace to some organics, trace gravel, grey, moist, loose to compact		2	SS	20		84			
			3	SS	9		83			
82.0			4	SS	7					
3.1	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown, moist, very stiff to hard		5	SS	22		82	>225		
			6	SS	58		81	>225		
			7	SS	34		80	>225		
			8	SS	35		79	>225		
			9	SS	39		78			
							77			
							76			

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-11

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-20-2018

REF. NO.: 18-519-10
ENCL NO.: 12

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: sandy, trace gravel, greyish brown, moist, very stiff to hard(Continued)						75					
	wet sand seams below 10.7 m							wet spoon				
11			10	SS	50		74					
12			11	SS	41		73			>225		
13							72					
71.4												
13.7	**SILT CLAY:** trace sand/silt seams, grey, moist, stiff to very stiff											
14			12	SS	14		71			125		
15			13	SS	21		70			150		
16							69					
17			14	SS	19		68			150		
18			15	SS	23		67			175		
19							66					
20												

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-11

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-20-2018

REF. NO.: 18-519-10
ENCL NO.: 12

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
64.7	**SILT CLAY:** trace sand/silt seams, grey, moist, stiff to very stiff(Continued)		16	SS	16		65			150	
20.4	**END OF BOREHOLE** Notes: 1) Borehole dry upon completion										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-12

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-24-2018

REF. NO.: 18-519-10
ENCL NO.: 13

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
83.2 / 0.0	**TOPSOIL:** 150 mm						
83.0 / 0.2	**FILL:** silty clay, mixed with topsoil/organics, trace gravel, brown to grey, moist, loose to compact		1	SS	23		83
			2	SS	28		82
			3	SS	6		
80.5 / 2.7			4	SS	7		81
	CLAYEY SILT TILL: sandy, trace gravel, occassional cobble/boulders, brown, moist, very stiff to hard		5	SS	24		80
			6	SS	50		79
			7	SS	56		78
			8	SS	60	▽	77
74.1 / 9.1	**CLAYEY SILT:** trace seams/partings of silt, grey, moist, very stiff		9	SS	23		76
							74

Bentonite

W. L. 75.2 m
Sep 26, 2018

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED
● QUICK TRIAXIAL
+ FIELD VANE & Sensitivity
× LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)
>225	
>225	
>225	
>225	

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-12

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-24-2018

REF. NO.: 18-519-10
ENCL NO.: 13

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	ELEVATION
71.0	**CLAYEY SILT:** trace seams/partings of silt, grey, moist, very stiff(Continued)	10	SS	26	73
12.2	**SILT :** trace to some clay, trace sand, grey, very moist to wet, compact to dense	11	SS	18	71
		12	SS	30	69
68.0					
15.2	**CLAYEY SILT TO SILTY CLAY :**trace sand, grey, moist, very stiff to hard	13	SS	21	68
		14	SS	42	66
64.9					
18.3	**SILT TO CLAYEY SILT:** some clay, grey, moist, compact to dense	15	SS	29	65
					64

GROUND WATER CONDITIONS: Filter Pack; Slotted pipe; Bentonite

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
(20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa): 175; >225; >225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-12

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-24-2018

REF. NO.: 18-519-10
ENCL NO.: 13

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
62.8	**SILT TO CLAYEY SILT:** some clay, grey, moist, compact to dense(Continued)		16	SS	34		63		○		
20.4	**END OF BOREHOLE:** Notes: 1) 50 mm dia monitoring well installed upon completion. 2) Water level in moniotring well at 8m on Sept. 26, 2018.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-13

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 14

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
80.2							
0.0 / 79.4	**FILL:** sand & gravel, trace silt, grey, moist		1	AS			80
0.8 / 78.7	**FILL:** silty clay, trace gravel, grey, moist, stiff		2	SS	8		79
1.5 / 77.9	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff		3	SS	21		78
2.3 / 75.6	**CLAYEY SILT TO SILT:** trace sand, grey, moist, very stiff		4	SS	18		77
			5	SS	17	▽	76
4.6 / 74.1	**SANDY SILT TO SILTY SAND TILL :** trace clay, trace gravel, grey, wet, very dense		6	SS	64	W. L. 75.6 m during drilling	75
6.1 / 72.6	**CLAYEY SILT TILL :**sandy, frequent sand seams, trace gravel, grey, moist, hard		7	SS	38		74
7.6 / 71.1	**SANDY SILT:** trace to some clay, brownish grey, wet, dense		8	SS	49		73
9.1	**SILTY CLAY:**frequent seams of silt, grey, moist, hard		9	SS	37		72
							71

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
200
200
>225
>225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-13

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 14

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE & Sensitivity, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
69.5	**SILTY CLAY:**frequent seams of silt, grey, moist, hard(Continued)						70				
10.7 / 69.1	**SILT TO CLAYEY SILT:** seams of sand, trace gravel, grey, moist, very dense		10	SS	70/ 279mm				○		
11.1	**END OF BOREHOLE:** Notes: 1) Borehole terminated due to eruption of gas with mud and water from hole. 2) Water level at 4.6 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-14

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 15

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.4												
0.0 / 79.6	**FILL:** sand and gravel, trace rootlets, grey, moist		1	AS			80		○			
0.8 / 78.9	**FILL:** silty clay, trace gravel, pieces of wood, grey, moist, loose		2	SS	8		79		○			
1.5 / 78.1	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff		3	SS	29				○	>225		
2.3 / 77.2	**SHALE:** Georgian Bay Formation, weathered, grey		4	SS	50/ 50 mm		78		○			
			5	SS	50/ 50 mm				○			
3.2	**END OF BOREHOLE:** Notes: 1) Borehole dry and open upon completion.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-15

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 16

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.4										
0.0 / 79.6	**FILL:** sand and gravel, trace rootlets, grey, moist		1	AS			80			
0.8 / 78.9	**FILL:** clayey silt, trace organics, grey, moist, compact		2	SS	18		79			
1.5 / 78.1	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, stiff		3	SS	9			125		9 33 42 16
2.3 / 77.3	**SILT:** trace to some clay, trace sand, brown, moist, compact		4	SS	22		78	>225		
3.1 / 76.6	**SILTY SAND:** some gravel, brown, moist, very dense		5	SS	50/ 100 mm		77			
3.8 / 74.3	**SILTY CLAY:** trace sand, grey, moist, hard to very stiff		6	SS	33		76	>225		
			7	SS	21			>225		
6.1 / 71.3	**SILT TO CLAYEY SILT:** trace sand, grey, moist, compact to very dense		8	SS	22		75			
			9	SS	50/ 50 mm		74	>225		
9.1 / 71.1	**SHALE:** Georgian Bay Formation, weathered, grey		10	SS	50/ 50 mm		73			
9.3	**END OF BOREHOLE**						72			

Notes:
1) Borehole dry and open upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-16

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-23-2018

REF. NO.: 18-519-10
ENCL NO.: 17

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	BLOWS "N" 0.3 m
82.9 / 0.0	**TOPSOIL:** 100 mm			
82.8 / 0.1	**FILL:** clayey silt, mixed with topsoil, brown, moist, compact	1	SS	19
		2	SS	10
		3	SS	15
80.6 / 2.3	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard	4	SS	21
	frequent wet sand seams	5	SS	28
79.4 / 3.5	**SAND:** trace silt, brown, wet, compact			
78.3 / 4.6	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, hard	6	SS	30
		7	SS	36
75.3 / 7.6	**SANDY SILT TILL:** some clay, trace gravel, sand seams, grey, very moist to wet, dense	8	SS	38
73.8 / 9.1	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, very stiff to hard	9	SS	30

GROUND WATER CONDITIONS: Bentonite; W. L. 80.2 m Sep 26, 2018; Slotted Pipe

ELEVATION: 82, 81, 78, 77, 76, 75, 74, 73

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa): >225; >225; >225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +³, ×³: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-16

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-23-2018

REF. NO.: 18-519-10
ENCL NO.: 17

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: sandy, trace gravel, grey, moist, very stiff to hard(Continued)											
11			10	SS	33		72					
12												
70.7												
12.2	**CLAYEY SILT:** trace sand, occassional seams of silt, grey, moist, very stiff to hard		11	SS	21		71			>225		
13												
14			12	SS	29		70					
15												
16			13	SS	30		69					
17	frequent seams of silt below 16.8 m		14	SS	28		68					
18												
19			15	SS	24		67					
20							66					
							65					
							64					
							63					

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-16

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-23-2018

REF. NO.: 18-519-10
ENCL NO.: 17

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
62.5			16	SS	25						
20.4	**END OF BOREHOLE:** Notes: 1) Monitoring well was installed beside BH18-16. 2) Water level in the monitoring well at 2.7m on Sept. 26, 2018.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε_f=3% Strain at Failure

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LOG OF BOREHOLE BH18-17

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 18

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	ELEVATION
80.3						
80.0 / 0.1	**ASPHALT:** 100 mm					
80.0	**GRANULAR BASE:** 250 mm		1	AS		80
0.3 / 79.5	**FILL:** sandy silt, trace topsoil/organics, greyish brown, moist					
0.8 / 78.8	**FILL:** silty clay, trace organics, trace gravel, grey, moist, loose		2	SS	7	79
1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard		3	SS	18	
			4	SS	50/ 25mm	78
			5	SS	82/ 280mm	77
			6	SS	26	76
74.2						
6.1	**CLAYEY SILT:** sandy, grey, moist, hard		7	SS	34	74
			8	SS	36	73
71.2						72
9.1	**SILT:** some clay, trace sand, grey, moist to wet, compact		9	SS	26	71

GROUND WATER CONDITIONS

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
>225
>225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-17

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 18

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT: some clay, trace sand, grey, moist to wet, compact(Continued)						70				
11			10	SS	27		69		○		
12 68.1											
12.2	**SILTY CLAY & SILT:** interbedded, trace sand, grey, moist, hard		11	SS	37		68		○		
13							67				
14			12	SS	45		66		○		
15 65.1											
15.2	**SILT TO SANDY SILT:** trace clay, grey, wet, very dense		13	SS	53		65		○		
16 63.5							64				
16.8	**SILTY CLAY:**trace sand, grey, moist, hard		14	SS	73		63		○		
17 18 62.0											
18.3	**SILT:**trace to some clay, grey, wet, very dense		15	SS	70/ 280mm		62		○		
19 60.8							61				
19.5	**CLAYEY SILT TILL:**sandy, trace gravel, grey,moist, hard										
20											

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

LOG OF BOREHOLE BH18-17

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 18

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
59.9	**CLAYEY SILT TILL:**sandy, trace gravel, grey,moist, hard(Continued)		16	SS	50/ 50mm		60				
20.4	**END OF BOREHOLE** Notes: 1) Water level at 9.1m during drilling.										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

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LOG OF BOREHOLE BH18-18

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 19

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	GR	SA	SI	CL
81.1												
0.0	**FILL:** sand and gravel, moist	1	AS			81						
80.3												
0.8	**FILL:**clayey silt, trace to some organics, greyish brown, moist, loose	2	SS	9		80						
79.4												
1.7	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, stiff to hard	3	SS	11		79	125					
		4	SS	29			>225					
		5	SS	33		78	>225					
76.5						77						
4.6	**SILTY CLAY:**seams of silt, trace sand, grey, moist, very stiff	6	SS	15		76	175					
75.0					▽	75						
6.1	**SILT:** trace to some clay, grey, wet, compact	7	SS	19								
		8	SS	25		74						
72.0						73						
9.1	**SAND AND GRAVEL:** some silt, grey, wet, very dense	9	SS	86		72						

W. L. 75.0 m during drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

METHANE AND GRAIN SIZE DISTRIBUTION (%)

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-18

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 19

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
70.4	**SAND AND GRAVEL:** some silt, grey, wet, very dense(Continued)						71					
10.7	**SILT:** trace to some clay, trace sand, grey, wet, very dense		10	SS	76		70		○			
68.9							69					
12.2	**SILTY CLAY:** trace sand, grey, moist, hard		11	SS	51				○	>225		
67.4							68					
13.7	**SHALE:** Georgian Bay Formation, weathered, grey		12	SS	50/ 50 mm				○			
67.1												
14.0	**END OF BOREHOLE:** Notes: 1) Water level at 6.1m during drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-19

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 20

| SOIL PROFILE | | | SAMPLES | | |

LOG OF BOREHOLE BH18-19

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 20

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
69.5	Total Core Recovery = 100% Solid Core Recovery = 40% RQD = 30% Hard Layer (Limestone/Siltstone)= 15% Maximum Thickness of Hard Layer = 125mm(Continued)		5	RC			70					
11.2	**END OF BOREHOLE:** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Water level in the monitoring well at 4.7m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; $\circ^{\varepsilon=3\%}$ Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-20

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 21

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
80.3 / 80.2	**ASPHALT:** 70mm				
0.1 / 79.9	**GRANULAR BASE:** 300mm	1	AS		80
0.4 / 79.5	**FILL:** clayey silt, some sand, trace gravel, greyish brown, moist				
0.8	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, hard	2	SS	33	79
		3	SS	45	
77.2		4	SS	83	78
3.1 / 76.9	**SAND:** trace silt, grey, wet, compact	5	SS	28	77
3.4 / 75.7	**SILTY CLAY :** trace sand, grey, moist, very stiff				
4.6 / 74.2	**SILT TO CLAYEY SILT:**trace sand, occassional wet sand seams, grey, moist, hard	6	SS	52	76 / 75
6.1	**SILT:**trace to some clay, some sand, grey, wet, dense to very dense	7	SS	57	74
		8	SS	48	73 / 72
71.2					
9.1	**SILT TO CLAYEY SILT:**trace sand, grey, moist to very moist, hard	9	SS	39	71

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
>225		
>225		Wet Spoon
>225		

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-20

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 21

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT TO CLAYEY SILT: trace sand, grey, moist to very moist, hard (Continued)						70					
69.6												
10.7 / 69.4	**SHALE:** Georgian Bay Formation, weathered, grey		10	SS	50/ 100mm				○			
10.9	**END OF BOREHOLE**											

Notes:
1) Water level at 3.1m during drilling.

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-21

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 22

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
79.7							
0.0 79.4	**TOPSOIL:** 350mm		1	SS	8		
0.3 79.0	**FILL:** silty clay mixed with topsoil, trace gravel, brown, moist, loose						79
0.7 1 78.2	**FILL:** sand and gravel mixed with weathered shale, brown, moist, compact		2	SS	23		
1.5 2 77.3	**SHALE:** Georgian Bay Formation, weathered, grey		3	SS	50/ 100mm		78
2.4	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.		4	SS	50/ 100mm		

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-25

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-10-2018

REF. NO.: 18-519-10
ENCL NO.: 23

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.5												
0.0 / 76.7	**FILL:** sand and gravel, cobbles		1	AS		▽	77		○			Wet spoon
0.8 / 75.2	**FILL:** 19mm crusher run limestone, grey, wet, loose to compact		2	SS	6		W. L. 76.7 m during drilling		○			
			3	SS	10		76		○			
2.3 / 73.7	**SAND AND GRAVEL:** trace silt, grey, wet, very dense		4	SS	50/ 100mm		75		○			
			5	SS	50/ 100mm		74		○			
3.8 / 73.3	**SILTY CLAY :** trace to some sand, grey, moist, hard		6	SS	39				○			
4.2 / 73.1	**SHALE:** Georgian Bay Formation, weathered, grey											
4.4	**END OF BOREHOLE:** Notes: 1) Water level at 0.8m during drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-27

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-10-2018

REF. NO.: 18-519-10
ENCL NO.: 27

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
77.3							
0.0	**FILL:** sand and gravel, grey, moist, loose		1	AS			77
1			2	SS	7		
75.8							76
1.5	**FILL:** silty sand, trace gravel, brown, moist, compact		3	SS	11		
2							
75.0						▽	75
2.3	**SAND:** trace silt, brown, wet, very loose		4	SS	WH		W. L. 75.0 m during drilling
3							
74.2							
3.1	**SILTY CLAY:** trace sand, grey, moist, firm		5	SS	6		74
73.5							
3.8	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 100mm		
4 73.3							
4.0	**END OF BOREHOLE:** Note: 1) Water level at 2.3 m during drilling						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-28

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 25

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.8												
82.7 / 0.1	**ASPHALTIC CONCRETE:** 70mm **GRANULAR BASE:** 600mm		1	AS					○			
82.1 / 0.7	**FILL:** clayey silt mixed with sand and gravel, brown, moist, very stiff to firm		2	SS	17		82		○			
	grey and wet below 1.5 m		3	SS	15	▽	W. L. 81.3 m during drilling		○			
	fragments of Concrete		4	SS	6		81		○			
79.7 / 3.1	**SAND AND GRAVEL:** cobbles, brown, wet, very dense		5	SS	57		80		○			
79.5 / 3.3	**END OF BOREHOLE** Notes: 1) Auger refusal at 3.3m on possible shale bedrock.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-29

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-09-2018

REF. NO.: 18-519-10
ENCL NO.: 24

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
77.5							
0.0 / 76.8	**FILL:** sand and gravel, brown, moist		1	AS			77
0.7 / 76.0	**FILL:** clayey silt, some sand and gravel, greyish brown, moist, compact		2	SS	17		
1.5	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown to grey, moist, stiff to very stiff		3	SS	12		76
	grey below 2.3 m		4	SS	8		75
			5	SS	8		74
			6	AS			
			7	SS	21		73
							Bentonite
71.2							72
6.3 / 71.0	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey		8	SS	69		
6.5	**SHALE BEDROCK:** Total Core Recovery = 96% Solid Core Recovery = 70% RQD = 37% Hard Layer (Limestone/Siltstone)= 27% Maximum Thickness of Hard Layer = 270mm		RUN 1	RC			71
69.5							70
8.0	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 77% RQD = 77% Hard Layer (Limestone/Siltstone)= 27% Maximum Thickness of Hard Layer = 230mm		RUN 2	RC			69
68.0 / 9.5							68

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE — 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

July 09, 2018

July 10, 2018

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3%: Strain at Failure

LOG OF BOREHOLE BH18-29

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-09-2018

REF. NO.: 18-519-10
ENCL NO.: 24

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
66.6 / 10.9	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 93% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer ≤ 50mm(Continued)	RUN 3	RC		
	SHALE BEDROCK: Total Core Recovery = 100% Solid Core Recovery = 98% RQD = 98% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm	RUN 4	RC		66
65.2 / 12.3	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 97% RQD = 97% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm	RUN 5	RC		65
63.6 / 13.9	**END OF BOREHOLE** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Monitoring well was not accessible on Sept. 26, 2018. Area is covered with a stock-pile.				64

Filter Pack
Slotted Pipe

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE
PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)
POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ε_f=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-30

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 26

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.2 / 0.0	**ASPHALTIC CONCRETE:** 70mm										
76.8 / 0.4	**GRANULAR BASE:** 300mm		1	AS			77				
	SILTY CLAY: trace sand, shale fragments, grey, moist, hard		2	SS	21		76		○		
75.7 / 1.5	**SHALE:** Georgian Bay Formation, weathered, grey		3	SS	50/ 75mm				○		
75.5 / 1.7	**END OF BOREHOLE**										

Notes:
1) Borehole dry and open upon completion.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-31

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 28

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
77.3							
0.0	**FILL:** silty sand and gravel, grey, moist		1	AS			77
76.5							
0.8	**FILL:** silty clay, trace gravel, trace organics, grey, moist to wet, stiff to firm		2	SS	15		76
			3	SS	7		
			4	SS	5	▽ W. L. 75.0 m during drilling	75
			5	SS	5		74
73.5							
3.8	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 125mm		
73.2							
4.1	**END OF BOREHOLE:** Notes: 1) Water level at 2.3 m during drilling						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-32

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-06-2018

REF. NO.: 18-519-10
ENCL NO.: 29

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION
77.2							
0.0 / 76.4	**FILL:** sand and gravel, brown		1	AS			77
0.8 / 75.7	**FILL:** 19mm crusher run limestone, brick/concrete fragments, grey, wet, compact		2	SS	22		76
1.5 / 74.9	**FILL:**sandy silt mixed with gravel, trace clay, grey, wet, very dense		3	AS	50/ 25mm		75
2.3	**SAND AND GRAVEL:** grey, wet, very loose		4	SS	2	W. L. 74.9 m Sep 26, 2018	
			5	SS	2		74
	cobbles below 4 m		6	SS	50/ 50mm	Bentonite	
72.9							73
4.3 / 72.2	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey Total Core Recovery = 67% Solid Core Recovery = 33%		RUN 1	RC			
5.0 / 70.8	RQD = 33% Hard Layer (Limestone/Siltstone)=15% Maximum Thickness of Hard Layer =140mm Total Core Recovery = 100% Solid Core Recovery = 84% RQD = 73% Hard Layer (Limestone/Siltstone)= 15%		RUN 2	RC			72
6.4 / 69.2	Maximum Thickness of Hard Layer =140mm Total Core Recovery = 100% Solid Core Recovery = 94% RQD = 94% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm		RUN 3	RC			71
8.0 / 67.8	Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 93% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm		RUN 4	RC			70
9.4						Filter Pack	69
							68
						Slotted Pipe	

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

July 06, 2018

July 09, 2018

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

LOG OF BOREHOLE BH18-32

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-06-2018

REF. NO.: 18-519-10
ENCL NO.: 29

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 93% Hard Layer (Limestone/Siltstone)= 15% Maximum Thickness of Hard Layer = 100mm(Continued)		RUN 5	RC			67					
66.3 10.9	**END OF BOREHOLE:** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Water level in the monitoring well at 2.3m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ $^{\varepsilon}$=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-33

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 30

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0 / 79.2	**TOPSOIL:** 300mm											
0.3	**FILL:** silty clay, trace sand, grey, moist, compact		1	SS	52		79		○			
1 / 78.4			2	SS	14				○	125		
1.1	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble/boulder, brown, moist, stiff to hard		3	SS	33		78		○	>225		2 23 46 29
2			4	SS	55		77		○	>225		
3			5	SS	62		76		○			
3.8 / 75.5	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 100mm							
4 / 4.0	**END OF BOREHOLE**											

Notes:
1) Borehole dry and open upon completion.

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-34

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 31

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.1 / 0.0	**TOPSOIL:** 200mm						80					
79.9 / 0.2	**FILL:** silty clay, trace gravel, dark grey, moist, loose		1	SS	8				○			
79.3 / 0.8	**CLAYEY SILT TILL:** trace gravel, brown, moist, very stiff to hard		2	SS	27		79		○	>225		
			3	SS	31				○	>225		
			4	SS	72		78		○			
77.0 / 3.1	**SHALE:** Georgian Bay Formation, weathered, grey		5	SS	50/ 100mm		77					
76.8 / 3.3	**END OF BOREHOLE**											

Notes:
1) Borehole dry and open upon completion.

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-35

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 32

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.9												
77.8	**TOPSOIL :**125 mm											
0.1	**FILL :** clayey silt, trace gravel, trace cobbles, brown to grey, moist, loose to compact		1	SS	11				○			
			2	SS	20		77		○			
			3	SS	13		76		○			
			4	SS	10		75		○			
			5	SS	5		74		○			
73.7												
73.6	**SHALE:** Georgian Bay Formation,											Wet spoon
4.3	weathered, grey											
	END OF BOREHOLE:											
	Notes:											
	1) Water level at 4.1 m upon completion of borehole.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-36

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 33

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.3 / 0.0	**TOPSOIL :**150 mm											
80.2 / 0.2	**FILL:** clayey silt, trace asphalt/concrete fragments, trace organics, grey to dark grey, moist, compact		1	SS	18		80					
			2	SS	12		79					
78.8 / 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff		3	SS	25							
78.0 / 2.3	**SILTY CLAY:**some sand, brown, moist, hard		4	SS	44		78					0 11 57 32
			5	SS	50/ 100mm		77					
75.7 / 4.6	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 75mm		76					
75.5 / 4.8	**END OF BOREHOLE:** Notes: 1) Borehole dry and open upon completion.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-37

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 34

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
81.3 / 0.0	**TOPSOIL:** 230mm						81
81.1 / 0.2	**FILL:** clayey silt, trace gravel, trace organics, brown, very moist, compact		1	SS	15		
80.6 / 0.7	**FILL:** sandy gravel/cobbles, grey, moist, compact		2	SS	19		80
79.8 / 1.5	**CLAYEY SILT:** trace sand, trace gravel, brown, moist, hard		3	SS	44	▽ W. L. 79.3 m Sep 26, 2018	
			4	SS	50/ 125mm		79
78.2 / 3.1	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey Bedrock coring started at 3.8 m		5	SS	50/ 75mm		78
77.5 / 3.8	Total Core Recovery = 62% Solid Core Recovery = 0% RQD = 0% Hard Layer (Limestone/Siltstone)= less than 5% Maximum Thickness of Hard Layer = 50mm		RUN 1	RC		Bentonite	
76.4 / 4.9	Total Core Recovery = 90% Solid Core Recovery = 68% RQD = 68% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm		RUN 2	RC			77
74.9 / 6.4	Total Core Recovery = 100% Solid Core Recovery = 61% RQD = 56% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm		RUN 3	RC			76
							75
73.3 / 8.0	Total Core Recovery = 100% Solid Core Recovery = 94% RQD = 94% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm		RUN 4	RC		Filter Pack	74
71.7 / 9.6						Slotted Pipe	73

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

June 27, 2018

July 30, 2018

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3%: Strain at Failure

LOG OF BOREHOLE BH18-37

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 34

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Total Core Recovery = 100% Solid Core Recovery = 88% RQD = 88% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm(Continued)		RUN 5	RC			71					
70.4 10.9	**END OF BOREHOLE** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Water level in the monitoring well at 2.0m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-38

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 35

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
80.3 / 0.0	**TOPSOIL:** 230mm						
80.1 / 0.2	**FILL:** clayey silt, trace gravel, trace cobbles, asphalt fragments, dark brown to dark grey, very moist, compact		1	SS	11		80
			2	SS	16		79
78.5 / 1.8	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, brown, moist, stiff to hard		3	SS	14		
			4	SS	58		78
			5	SS	50/ 100mm		77
75.7 / 4.6							76
75.5 / 4.8	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 50mm		
	END OF BOREHOLE						

Notes:
1) Borehole dry and open upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-39

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-21-2018

REF. NO.: 18-519-10
ENCL NO.: 36

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.8										
0.0 / 81.6	**TOPSOIL:** 250mm									
0.3 / 81.0	**FILL:** sandy silt mixed with topsoil, brown, moist, compact		1	SS	14					
0.8 / 78.7	**FILL:** silt to clayey silt, trace gravel, trace topsoil/organics, grey, moist, compact		2	SS	12		81			
			3	SS	19		80			
			4	SS	13		79			
3.1 / 77.2	**SANDY SILT TILL :** trace to some clay, trace gravel, grey, moist, very dense		5	SS	50/ 125mm		78			
4.6 / 72.7	**SILTY CLAY TILL:** sandy, trace gravel, grey, moist, hard		6	SS	65		77	>225		Mud Rotary Drilling
			7	SS	64		76	>225		
			8	SS	38		75	>225		
9.1	**SILT :** some clay, trace gravel, grey, wet, dense		9	SS	36		74			
							73			
							72			

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-39

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-21-2018

REF. NO.: 18-519-10
ENCL NO.: 36

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION
71.1	**SILT :** some clay, trace gravel, grey, wet, dense(Continued)				
10.7	**SILTY SAND TILL:** trace clay, trace gravel, grey, wet, very dense	10	SS	75	71
69.6					70
12.2	**SILTY CLAY TILL:** sandy, trace gravel, grey, moist, hard	11	SS	40	69
	seams of sand at 13.7 m	12	SS	50/ 150mm	68
66.6					67
15.2	**SILT:**trace clay, trace sand, grey, wet, dense	13	SS	44	66
65.0					65
16.8	**SILTY CLAY TILL:** sandy, seams of sand, trace gravel, grey, moist, hard	14	SS	84	64
63.5					63
18.3	**SILTY CLAY:**trace sand, grey, moist, hard	15	SS	64	62

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100
PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
>225		
>225		
>225		
>225		

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-39

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-21-2018

REF. NO.: 18-519-10
ENCL NO.: 36

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
61.4	**SILTY CLAY:**trace sand, grey, moist, hard(Continued)		16	SS	52				○	>225	
20.4	**END OF BOREHOLE:** Notes: 1) Water level at 9 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-40

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 37

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.8										
0.0 / 81.8	**TOPSOIL:** 200mm									
0.2	**FILL:**clayey silt, trace topsoil/organics, shale fragments, dark brown, moist, compact		1	SS	16					
			2	SS	12		81			
1 / 80.3										
1.5	**CLAYEY SILT TILL :** sandy, trace gravel, brown, moist, stiff		3	SS	10		80	125		
2 / 79.5						▽				
2.3	**SANDY SILT TO SILTY SAND:** trace clay, brown, wet, very dense		4	SS	50/ 100mm		W. L. 79.5 m during drilling			
3 / 78.7							79			
3.1	**SAND AND GRAVEL:** trace silt, grey, wet, very dense		5	SS	52					Wet Spoon
4 / 77.2							78			
4.6	**SILTY CLAY TILL :** sandy, trace gravel, grey, moist, hard		6	SS	34					
5 / 75.7							77			
6.1	**SANDY SILT :** trace clay, grey, wet, very dense		7	SS	58					0 23 70 7
7 / 74.2							76			
7.6	**SILTY CLAY TILL :** sandy, trace gravel, grey, moist, hard		8	SS	44			>225		
8							75			
9	interbed of sand at 9.1 m		9	SS	66		74	>225		
10							73			
							72			

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100
PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-40

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 37

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY TILL : sandy, trace gravel, grey, moist, hard(Continued)									
11			10	SS	90		71	>225		
12			11	SS	73		70	>225		
13			12	SS	23		69	175		
14			13	SS	31		68	>225		
15			14	SS	30		67	175		
16			15	SS	30		66	>225		
17							65			
18							64			
19							63			
20 62.0 19.8							62			

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED
● QUICK TRIAXIAL
+ FIELD VANE & Sensitivity
× LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-40

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 37

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
61.4	**SILTY CLAY:** trace sand, grey, moist, very stiff(Continued)		16	SS	26				○	200		
20.4	**END OF BOREHOLE** Notes: 1) Water level at 2.3 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-41

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 38

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
83.3 / 0.0	**TOPSOIL:** 152mm						
83.1 / 0.2	**FILL:** clayey silt, trace rootlet, trace asphalt, brown, moist, stiff		1	SS	12		83
			2	SS	12		
81.8 / 1.5	**SILT :** some sand, trace clay, brown, wet, loose		3	SS	5		82
81.0 / 2.3	**CLAYEY SILT TILL :** some sand, trace gravel, trace cobble, brown to grey, moist, very stiff to hard		4	SS	18		81
			5	SS	50/ 127mm		80
78.7 / 4.6	**SILT :** some sand, trace clay, grey, very moist to wet, dense		6	SS	32		79
77.2 / 6.1	**CLAYEY SILT TILL :** some sand, trace gravel, trace cobble, grey, moist, hard		7	SS	50/ 127mm		78
75.7 / 7.6	**SHALE:** Georgian Bay Formation, weathered, grey		8	SS	50/ 100mm		77
75.5 / 7.8	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion						76

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-42

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 39

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
85.7 / 0.0	**TOPSOIL:** 350 mm					
85.4 / 0.3	**FILL:** silty sand, trace topsoil/rootlets, some gravel, brown, moist, compact	1	SS	10		
84.9 / 0.8	**FILL:**sandy silt, trace clay, brown, wet, loose	2	SS	4		85
84.2 / 1.5	**FILL:** clayey silt, trace organics, grey, moist, stiff	3	SS	9		
		4	SS	11		84
82.3 / 3.4	**SANDY SILT:** trace clay, brown, moist, compact	5	SS	10		
81.1 / 4.6	**CLAYEY SILT TILL:** trace gravel, brown, moist, hard	6	SS	50/ 150mm		83
79.6 / 6.1	**SHALE:** Georgian Bay Formation, weathered, grey	7	SS	50/ 100mm		82
79.4 / 6.3	**END OF BOREHOLE**					81
	Notes: 1) Borehole dry and open upon completion.					80

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa): >225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-43

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 40

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.5												
0.0 / 83.2	**TOPSOIL:** 350mm											
0.3 / 82.7	**FILL:** clayey silt, brown, moist, stiff		1	SS	10		83		○			
0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard		2	SS	24				○			
			3	SS	28		82		○	>225		
	grey below 2.3 m		4	SS	33		81		○			
80.4												
3.1 / 80.1	**SHALE:** Georgian Bay Formation, weathered, grey		5	SS	50/ 125mm				○			
3.4	**END OF BOREHOLE**											

Notes:
1) Borehole open and dry upon completion

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-44

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 41

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
83.9							
0.0 / 83.6	**TOPSOIL:** 350mm		1	SS	7		
0.3 / 83.1	**FILL:** clayey silt, trace organics, brown, moist, firm						
0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, stiff to hard		2	SS	14		83
			3	SS	23		82
	trace shale fragments below 2.6 m		4	SS	35		81
			5	SS	43		
80.1							
3.8 / 79.9	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 100mm		80
4.0	**END OF BOREHOLE**						

Notes:
1) Borehole open and dry upon completion

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-45

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 42

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
83.0							
0.0 / 82.6	**TOPSOIL:** 400mm		1	SS	14		
0.4 / 81.5	**FILL:** sand and gravel, trace concrete/ brick pieces, brown, moist, compact		2	SS	17		82
1.5 / 80.7	**SILT TO CLAYEY SILT:** brown, moist, stiff		3	SS	13		81
2.3 / 79.2	**SILTY CLAY TILL:** trace gravel, grey, moist, very stiff to hard		4	SS	25		80
			5	SS	50/ 100mm		
3.8 / 78.7	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey Bedrock Coring started at 4.3 m		6	SS	50/ 50mm		79
4.3 / 78.1	**SHALE BEDROCK:** Total Core Recovery = 83% Solid Core Recovery = 75% RQD = 50%		RUN 1	RC			
4.9 / 76.6	Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 65% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 75mm		RUN 2	RC			78 77
6.4 / 75.1	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 57% RQD = 72% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 75mm		RUN 3	RC			76
7.9	**END OF BOREHOLE**						

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa): >225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

June 29, 2018

July 27, 2018

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

LOG OF BOREHOLE BH18-46

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 43

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.4									
0.0	**FILI:** sand and gravel, grey, moist	1	AS			81			
80.6									
0.8	**SILTY CLAY TILL :** sandy, trace gravel, brown, moist, hard to very stiff	2	SS	16					
		3	SS	48		80	>225		
	grey below 2.3 m	4	SS	33		79	>225		
		5	SS	36		78	>225		
		6	SS	24		77	200		
		7	SS	22		76			
73.8						75	200		
7.6	**SANDY SILT :** trace to some clay, grey, wet, compact to very dense	8	SS	24	▽	74			
		9	SS	94		W. L. 73.8 m during drilling			
						73			
						72			

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE — 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-46

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 43

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
70.7	**SANDY SILT :** trace to some clay, grey, wet, compact to very dense(Continued)						71					
10.7	**SILT TO SANDY SILT:** trace to some clay, grey, moist to very moist, very dense		10	SS	50							
			11	SS	50/ 127mm		70					
67.7							69					
13.7	**CLAYEY SILT:** trace sand, grey, moist, hard		12	SS	77		68			>225		
			13	SS	36		67					
			14	SS	31		66			>225		
			15	SS	51		65					
61.6							64					
19.8							63					
							62					

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-46

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 43

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
61.0	**SILT :** some clay, grey, wet, very dense(Continued)		16	SS	62		61		○		
20.4	**END OF BOREHOLE:** Notes: 1) Water level at 7.6 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-47

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 44

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
82.4 / 0.0	**TOPSOIL:** 200mm					
82.2 / 0.2	**FILL:** silty clay, trace gravel, brown, moist, loose	1	SS	5		82
81.6 / 0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to stiff	2	SS	18		
		3	SS	22		81
	grey below 2.3 m	4	SS	13		80
79.3 / 3.1	**SILT:** some clay, trace sand, grey, moist, compact	5	SS	21		79
77.8 / 4.6	**SILTY SAND TO SANDY SILT:** trace clay, trace gravel, grey, wet, dense	6	SS	32	▽ W. L. 77.8 m during drilling	78
76.3 / 6.1	**SHALE:** Georgian Bay Formation	7	SS	50/ 100mm		77
76.1 / 6.3	**END OF BOREHOLE**					

Notes:
1) Water level at 4.6 mbgl during drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
81.1 / 0.0	**TOPSOIL:** 200mm						81
80.9 / 0.2	**FILL :** clayey silt mixed with asphalt, trace organics, some sand, dark grey, moist, compact		1	SS	17		
1			2	SS	11		80
79.6 / 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown, moist, very stiff		3	SS	17		79
2 / 78.8 / 2.3	**SANDY SILT TILL :** trace to some clay, trace gravel, brown, moist, dense		4	SS	34		
3 / 78.0 / 3.1	**SILTY SAND :** trace clay, brown, wet, very dense		5	SS	50/ 150mm	▽ W. L. 78.0 m during drilling	78
4							77
76.5 / 4.6	**SAND:** trace silt, trace gravel, grey, wet, very dense		6	SS	66		76
5 / 75.0 / 6.1	**SILTY SAND:** trace clay, grey, wet, very dense		7	SS	87		75
7							74
8			8	SS	50/ 50mm		73
9 / 72.0 / 9.1	**SAND AND GRAVEL:** trace silt, grey, wet, very dense		9	SS	50/ 150mm		72
10							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
	SAND AND GRAVEL: trace silt, grey, wet, very dense(Continued)						71
11			10	SS	50/ 100mm		70
12 68.9							69
12.2	**SILTY SAND:** trace clay, grey, wet, very dense		11	SS	57		
13 67.4							68
13.7	**SILT :** trace clay, grey, wet, very dense		12	SS	50/ 150mm		
14 15 65.8							67
15.3	**SILTY CLAY TILL :** some sand to sandy, trace gravel, grey, moist hard		13	SS	79		66
16 64.3							65
16.8	**SILTY CLAY:** trace sand, grey, moist, hard		14	SS	47		64
17 18 62.8							63
18.3	**SILT TO CLAYEY SILT:** trace sand, grey, very moist, very dense		15	SS	50		62
19 20							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
>225
>225
>225

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ε=3% Strain at Failure

LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT TO CLAYEY SILT: trace sand, grey, very moist, very dense(Continued)		16	SS	64		61		○	>225	
60.7											
20.4	**END OF BOREHOLE:** Notes: 1) Water level at 3.1 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-49

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 46

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / 0.3 m "N"
80.8 / 0.0	**TOPSOIL:** 200 mm			
80.6 / 0.2	**FILL:** silty clay, trace asphalt, some gravel, dark grey, moist, firm	1	SS	5
80.0 / 0.8	**FILL :** sandy silt, dark grey, moist, very dense	2	SS	50/ 50mm
		3	SS	50/ 75mm
78.5 / 2.3	**SANDY SILT TILL :** some clay, trace gravel, grey, moist, compact to dense	4	SS	29
		5	SS	31
76.3 / 4.5	**SHALE:** Georgian Bay Formation, weathered, grey	6	SS	50/ 25mm
76.1 / 4.7	**END OF BOREHOLE:**			

Notes:
1) Borehole dry and open upon completion.

GROUND WATER CONDITIONS

ELEVATION: 80, 79, 78, 77

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED
● QUICK TRIAXIAL
+ FIELD VANE & Sensitivity
× LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH22-13

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-19-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 180mm											
0.2	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	23							
0.6	**FILL:** crusher run limestone, brown, wet, compact											
0.8	**FILL:** silty clay, some organics, some sand, trace gravel, grey, moist, stiff to very stiff		2	SS	10							
			3	SS	22							
2.3	**SILTY CLAY TILL:** some sand, some gravel, brown, moist, hard		4	SS	50							13 18 47 22
	trace shale fragments below 3.0m		5	SS	75							
3.7	**END OF BOREHOLE:**											

Notes:
1) Augar refusal @3.7m due to possible shale bedrock.
2) 50mm dia. monitoring well installed upon completion.
3) Water Level Readings:

Date: Water Level(mbgl):

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-15

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
0.0	**GRANULAR FILL:** sand and gravel, 280mm		1	SS	21		
0.3	**FILL:** sand & gravel, trace brick pieces, grey, moist, compact						
0.8	**FILL:** silty clay, trace organics, grey, moist, firm		2	SS	5		
1.5	**CLAYEY SILT:** trace sand, trace gravel, brown, moist, stiff		3	SS	11		
2.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble, brown, moist, hard		4	SS	44		
			5	SS	86		
			6	SS	47		
	grey below 6.1m		7	SS	50		
			8	SS	46		
8.2	**END OF BOREHOLE:**						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH22-16

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-18-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 150mm											
0.2	**GRANULAR BASE:** sand and gravel, 250mm		1	SS	9							
0.4	**FILL:** silty clay, some organics, some sand, trace gravel, grey, moist, stiff		2	SS	11							
1.2	**SILT TO CLAYEY SILT:** trace sand, brown, moist, stiff to hard		3	SS	30							0 7 76 17
2.3	**CLAYEY SILT:**, trace sand, trace gravel, brown, moist, hard		4	SS	77							
3.1	**SHALE BEDROCK:** grey,		5	SS	50/ 130mm							
3.2	weathered **END OF BOREHOLE:**											

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG-2021-DRAFT 22-200-100 GEO COPY.GPJ DS.GDT 22-8-12

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LOG OF BOREHOLE BH22-17

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-18-2022

REF. NO.: 22-200-100
ENCL NO.:

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 150mm										
0.2	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	12						
0.5	**FILL:** crusher run limestone										
0.8	**FILL:** clayey silt, trace organics, grey, moist, firm to very stiff		2	SS	7						
1.7	**SILTY CLAY TILL:** some sand, trace to some gravel, trace shale fragements, brown, moist, very stiff to hard		3	SS	29						
			4	SS	54						10 10 56 24
3.1	augar refusal at 3.1m on possible shale bedrock										
	END OF BOREHOLE:										

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date: Water Level(mbgl):

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH22-18

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-18-2022

REF. NO.: 22-200-100
ENCL NO.:

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 130mm										
0.1	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	16						
0.5	**FILL:** silty clay, some organics, trace asphalt, grey, moist, firm to very stiff		2	SS	6						
1.5	**SILT TO CLAYEY SILT:** trace sand, trace gravel, brown to grey, moist, very stiff to hard		3	SS	15						
			4	SS	31						
			5	SS	29						
	no recovery@4.3m		6	SS	50/ 25mm						
4.4	augar refusal on possible shale bedrock **END OF BOREHOLE:**										

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH22-21

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-19-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 150mm											
0.2	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	13							
0.5	**FILL:** sand, some asphalt pieces, trace gravel, dark brown, moist, loose to compact											
1.0	**SILTY CLAY:** trace sand, trace gravel, brown, moist, stiff to very stiff		2	SS	8							
			3	SS	20							0 4 68 28
			4	SS	25							
3.1	**CLAYEY SILT TILL/SHALE COMPLEX:** trace sand, trace gravel, grey, moist, hard		5	SS	69							
4.5	**SHALE BEDROCK:** grey, weathered		6	SS	50/50mm							
4.7	**END OF BOREHOLE:**											

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH22-4

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 180mm											
0.2	**GRANULAR BASE:** sand and gravel, 460mm		1	SS	4				○			
0.6	**FILL:** crusher run limestone											
0.8	**SILT TO CLAYEY SILT:** trace sand, trace gravel, brown, moist, very stiff to hard		2	SS	17				○ —			2 8 62 28
			3	SS	30				○			
2.3	**CLAYEY SILT TILL:** sandy, trace		4	SS	50/ 25mm				○			
2.4	gravel, brown, moist, hard **SHALE BEDROCK:** Georgian Bay Formation, grey, weathered TCR=75%, SCR=14%, RQD=0		R1	RC	50/ 75mm							
3.4	TCR=96%, SCR=98%, RQD=28% Hard layer=18%, Maximum hard layer thickness=50mm		R2	RC								
4.9	TCR=93%, SCR=90%, RQD=63% Hard layer=1%, Maximum hard layer thickness=25mm		R3	RC								
6.4	TCR=100%, SCR=98%, RQD=70% Hard layer=9%, Maximum hard layer thickness=25mm		R4	RC								
7.8	**END OF BOREHOLE:**											

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH22-6

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 200mm											
0.2	**GRANULAR BASE:** sand and gravel, 380mm		1	SS	8				○			
0.6	**FILL:** silty clay, some organics, brown, moist, stiff											
0.8	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, stiff to hard		2	SS	11				○			
	trace shale fragments below 1.5m		3	SS	50				○			
2.3	**SHALE BEDROCK:** grey, weathered		4	SS	50/ 50mm							
3.1	**END OF BOREHOLE:**											

Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:

Date: Water Level(mbgl):

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH22-8

PROJECT: Geotechnical Investigation
CLIENT: Rangeview Estate Precinct Development
PROJECT LOCATION: 855 Rangeview Road, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-15-2022

REF. NO.: 22-200-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**ASPHALT:** 130mm											
0.1	**GRANULAR FILL:** sand and gravel, 330mm		1	SS	12							
0.5	**FILL:** clayey silt, trace organics, trace gravel, brown, moist, stiff											
0.8	**CLAYEY SILT TILL/SHALE COMPLEX:** trace sand, trace gravel, brown to grey, moist, stiff to hard		2	SS	14							no recovery
			3	SS	53							
2.3	**SHALE BEDROCK:** weathered, grey		4	SS	50/ 150mm							
2.6	**END OF BOREHOLE:**											

DRAFT

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

Appendix B
Water Supply Support Information

Appendix B-1

Lakeview Community – Water Modelling Methodology and Analysis

(TMIG, 2021)

THE MUNICIPAL INFRASTRUCTURE GROUP LTD.
8800 Dufferin Street, Suite 200
Vaughan, Ontario L4K 0C5
T 905.738.5700
F 905.738.0065
www.tmig.ca

MEMORANDUM

DATE	May 6, 2021
TO	**Jeff Ormonde (Urbantech)**
CC	
SUBJECT	Lakeview Community Water Modelling Methodology and Analysis – 8050 Units
FROM	Cassandra Leal, P.Eng
PROJECT NUMBER	17201

1 Introduction

The Municipal Infrastructure Group Ltd. (TMIG) has been retained to conduct an analysis to review the water servicing capacity of the proposed watermain network (Urbantech, January 2020) relative to the contemplated development densities.

This memorandum will outline the modelling methodology adopted for the Lakeview Community. The water model was used to confirm that the proposed pipe network can supply the design water demands at appropriate pressures expected under various scenarios.

This memorandum has been updated with the updated population, provided from Urbantech May 2021. The watermain network is assumed to be unchanged.

2 Design Criteria

The Region of Peel produced the Inspiration Lakeview Water and Wastewater Servicing Analysis (May 2018). Within this document, the Region outlined the design criteria that apply to the proposed development:

- 265 Lpcd for average day water consumption
- A maximum day peaking factor of 1.8 for residential and 1.4 for employment growth
- A peak hour factor of 3.0

Also, there are limits to the velocity and pressures:

- Under Maximum Day demand, pipe velocity should remain below 1.5 m/s
- Under Maximum Day demand, pressure in the system should not drop below 280 kPa (40 psi)
- Pressure in the system should not drop below 140 kPa (20 psi) under a maximum day plus fire condition

Standards outlined in the Region's *Inspiration Lakeview Water and Wastewater Servicing Analysis (May 2018)* report and Inspiration Lakeview Conceptual Municipal Servicing Strategy (TMIG, July 2014) were used in substitution.

3 Population Breakdown

Using the information provided by Urbantech (May 2021), the populations in the water model were modified to match the populations used in the sanitary sewer design sheet and drainage map (dated August 2020). The information provided by Urbantech does not include the External Lands between the subject lands and Lakeshore Road. The sanitary drainage map used to obtain the population is found in **Appendix A.**

Detailed population and demand calculations can be found in **Appendix B**. The future demands for the external lands between Lakeshore Road and the Lakeview Community Lands (called "External") were calculated using the population

breakdown from the Inspiration Lakeview Village Masterplan Concept. This information is also included in **Appendix B** and is unchanged from previous submissions.

A summary of the water demands is provided in **Table 1**:

TABLE 1 WATER DEMANDS – SUMMARY

	Lakeview Community	External
Total Residential Population	22,042	10,048
Residential Avg Day Demand	67.6 L/s	30.8 L/s
Employment Avg Day Demand	24.7 L/s	0 L/s
Residential Max Day Demand	121.7 L/s	55.47 L/s
Employment Max Day Demand	34.5 L/s	0 L/s
Residential Peak Hour Demand	202.8 L/s	92.46 L/s
Employment Peak Hour Demand	74.0 L/s	0 L/s

4 Water Model Development

InfoWater has been selected for modelling the water distribution system for the study area. The key input factors for the model are described below:

4.1 Pipe Network

The preliminary watermain layout was provided by Urbantech and is included in **Appendix C**.

4.2 Water Demands

The average daily demands were calculated for each development block (internal), as shown in **Appendix B**. These demands were assigned to nodes adjacent to the respective parcels. The average day demand set is populated with the residential demands assigned to Demand 1 and employment demands assigned to Demand 2.

Based on the standards outlined in Inspiration Lakeview Water and Wastewater Servicing Analysis (May 2018) the peaking factor for the Maximum day is 1.8 for residential and 1.4 for employment. The peaking factor for Peak hour is 3 for both residential and employment.

The average day demand set was multiplied with the respective peaking factors to create separate maximum day and Peak hour demand sets.

Design fire demands have been proposed to be minimum of 300 L/s. This is common for commercial properties, and high-rise residential development.

Using the Inspiration Lakeview Master Plan population breakdown, the external lands were included in the model. For simplicity, the external demands were added as two demands in the model, an east and a west demand (Junction J-34 and J-198, respectively). The population breakdown included residential and employment. For this review, the appropriate rates and factors were used.

A table listing the nodes at which the development blocks were allocated is provided in **Appendix B**.

4.3 Boundary Conditions

The proposed development is located within Peel Region pressure zone PZ1. Since we are modelling a local area from within a larger distribution network, suitable boundary conditions were established at the study area limits (where the proposed internal network will connect to existing sub-transmission mains). The proposed connection locations are:

- To the 600 mm watermain along Lakeshore Road East, at Lakefront Promenade;
- To the 600 mm watermain along Lakeshore Road East, at Hydro Road;

Fixed head reservoirs were established at these two locations. The HGL elevations at these reservoirs were established through pressure logging data provided by Region of Peel. The details of the boundary conditions are in **Table 2**.

TABLE 2 HGL ELEVATIONS AT BOUNDARY CONDITIONS

Boundary Location	HGL Elevation	Source
Lakeshore Road East, at Lakefront Promenade	142 m	Region of Peel email dated September 11th
Lakeshore Road East, at Hydro Road	142 m	Region of Peel email dated September 11th

5 Modelling Results

The proposed watermain network and demands were simulated to determine the resulting pressures under various demand conditions. We also considered a condition where the Lakeshore Road watermain is unavailable and the lands area serviced only through the feed from the plant.

Pressure maps indicating modelled pressure at every node for the Scenarios are provided in Figure 1 through Figure 4. The InfoWater Junction output for all scenarios and Pipe output for Maximum day scenario is provided in **Appendix D**.

5.1 Normal Conditions Scenarios

Average day demand, maximum day demand, maximum day demand plus fire flow and peak hour demand scenarios were run with the two proposed connections to the existing 600mm Lakeshore Road watermain, at Lakefront Promenade and Hydro Road. These scenarios did not consider a feed from the west at Lakefront Promenade and Rangeview Road.

The summary of modelling results is provided in **Table 3**.

TABLE 3 MODELLING RESULTS SUMMARY

Water Demand Modeling Scenario	Minimum Water System Requirements	Modeling Results
Average Day Demand	Recommended Normal Pressures within System 275 kPa to 690 kPa (40 psi to 100 psi)	System Pressure = 510 kPa to 647 kPa (74 psi to 93 psi)
Maximum Day Demand	Recommended Normal Pressures within System 275 kPa to 690 kPa (40 psi to 100 psi)	System Pressure = 507 kPa to 643 kPa (74 psi to 93 psi)
	Flow velocity remains below 1.5 m/s within the distribution network	Flow velocity within the distribution network is between 0.01 m/s to 0.89 m/s.
Peak Hour Demand	Recommended Normal Pressures within System 275 kPa to 690 kPa (40 psi to 100 psi)	System Pressure = 498 kPa to 637 kPa (72 psi to 92 psi)
Maximum Day Demand plus Fire Flow	Required Fire Flow to be provided at a residual pressure of no less than 140 kPa	
	Fire flow requirements for the proposed development Q_f > 300 L/s	Available Fire Flow = 532 L/s to 2,710 L/s

5.2 Emergency Conditions Scenario

To simulate an emergency or maintenance condition where one or both water supply points to Lakeshore Road are not available, the two boundary conditions and watermain along Lakeshore Road East were turned off and the boundary condition to the west (supply from Lakefront Promenade and south of Rangeview Road) was turned on.

The HGL at this boundary condition was established through pressure logging data provided by the Region of Peel. The details of the boundary condition are in **Table 4**.

TABLE 4 HGL ELEVATION AT WEST BOUNDARY CONDITION

Boundary Location	HGL Elevation	Source
Water Treatment Plant, south of Rangeview Road	148 m	Region of Peel email dated September 11th

Under this condition, the pressures were between 488 – 643 kPa (71 to 93 psi). This is still within the acceptable pressure range. Figure 5 is the pressure map for this scenario. This scenario illustrates that the watermain network and sizing is acceptable for the population and demands for Lakeview Community. Under normal conditions, all three of these supply points would be available.

6 Conclusions and Recommendations

The modelled results all lie within acceptable range, but the pressures could exceed 600 kPa (90 psi) along Street A. The available fire flows at the nodes within the Study Area will be between 532 L/s and 2,710 L/s. The actual block-by-block fire flow requirements should be verified relative to these values.

The watermain network and sizing appears to be adequate for the population and demands used in this model.

FIGURE 1 AVERAGE DAY DEMAND SCENARIO PRESSURE

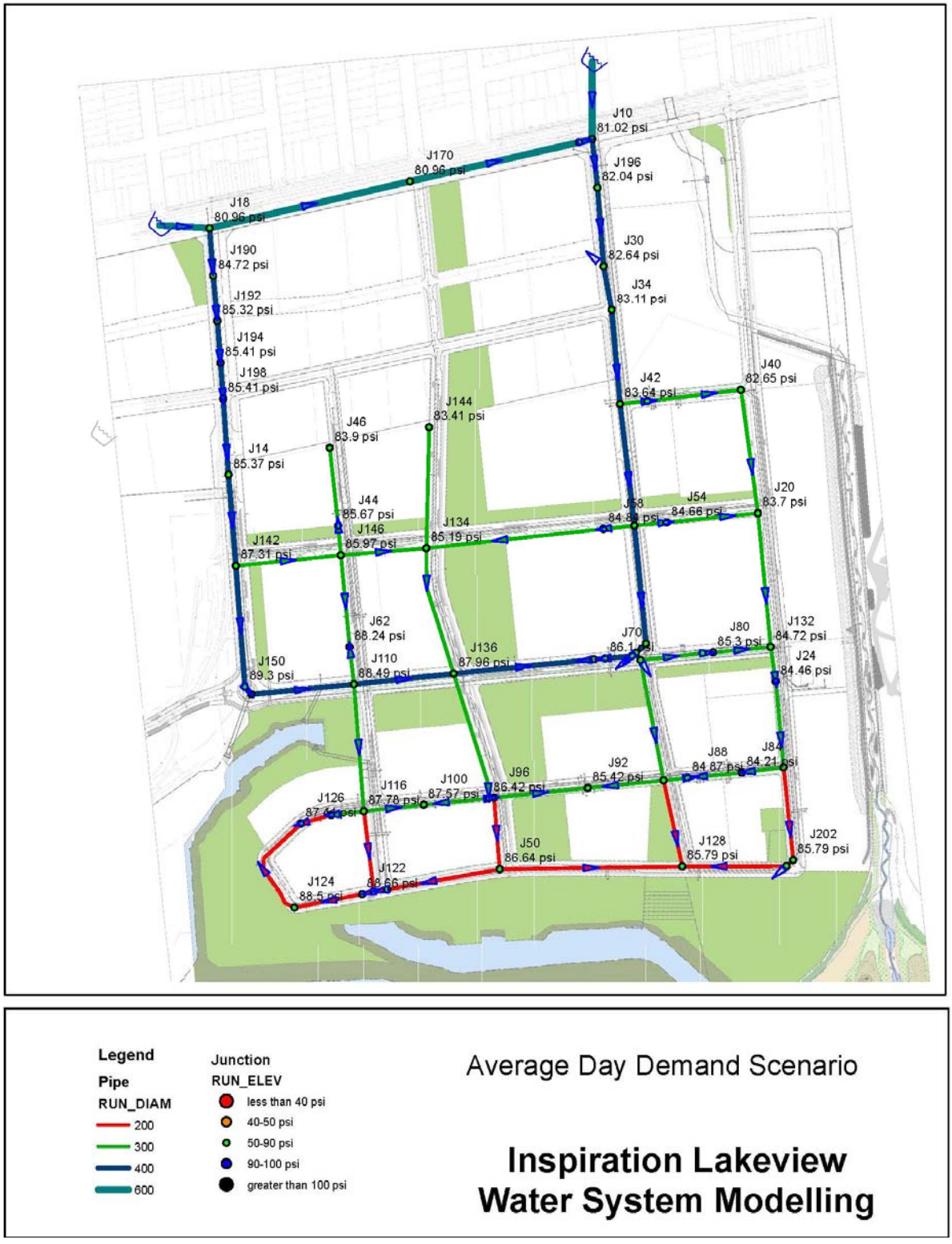


FIGURE 2 MAXIMUM DAY DEMAND SCENARIO PRESSURE

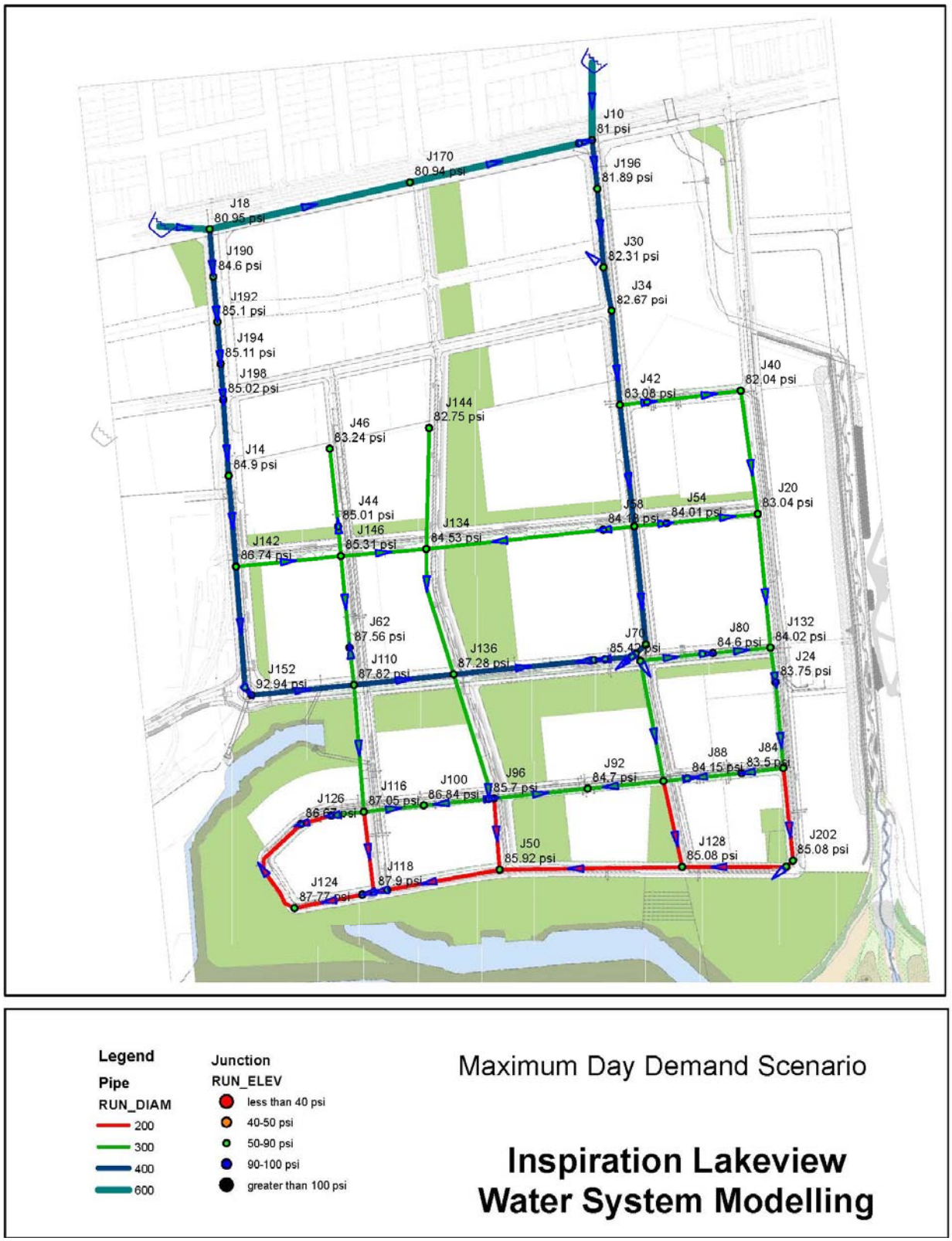


FIGURE 3 PEAK HOUR DEMAND SCENARIO PRESSURE

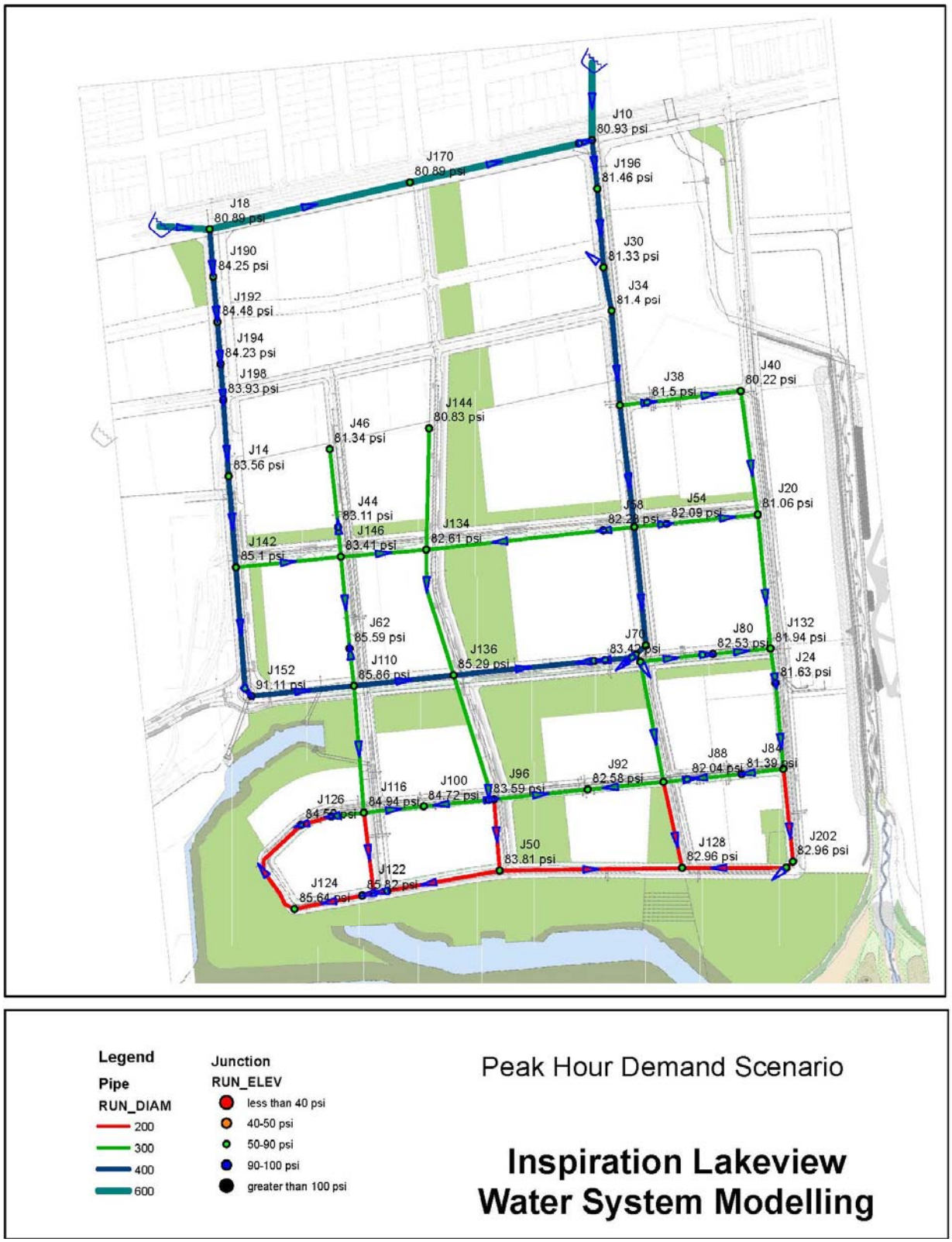


FIGURE 4 MAXIMUM DAY PLUS FIRE FLOW SCENARIO AVAILABLE FIREFLOW

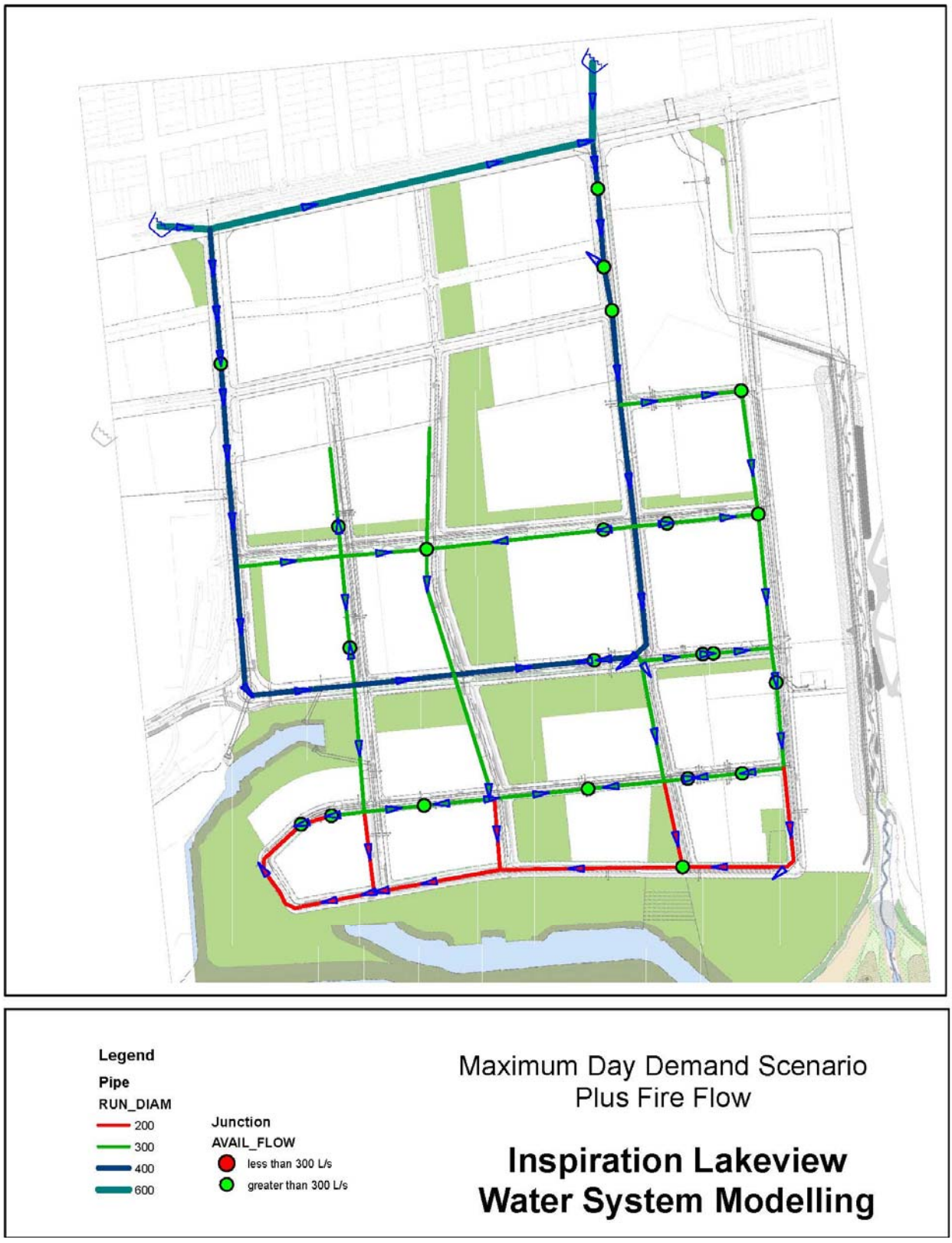
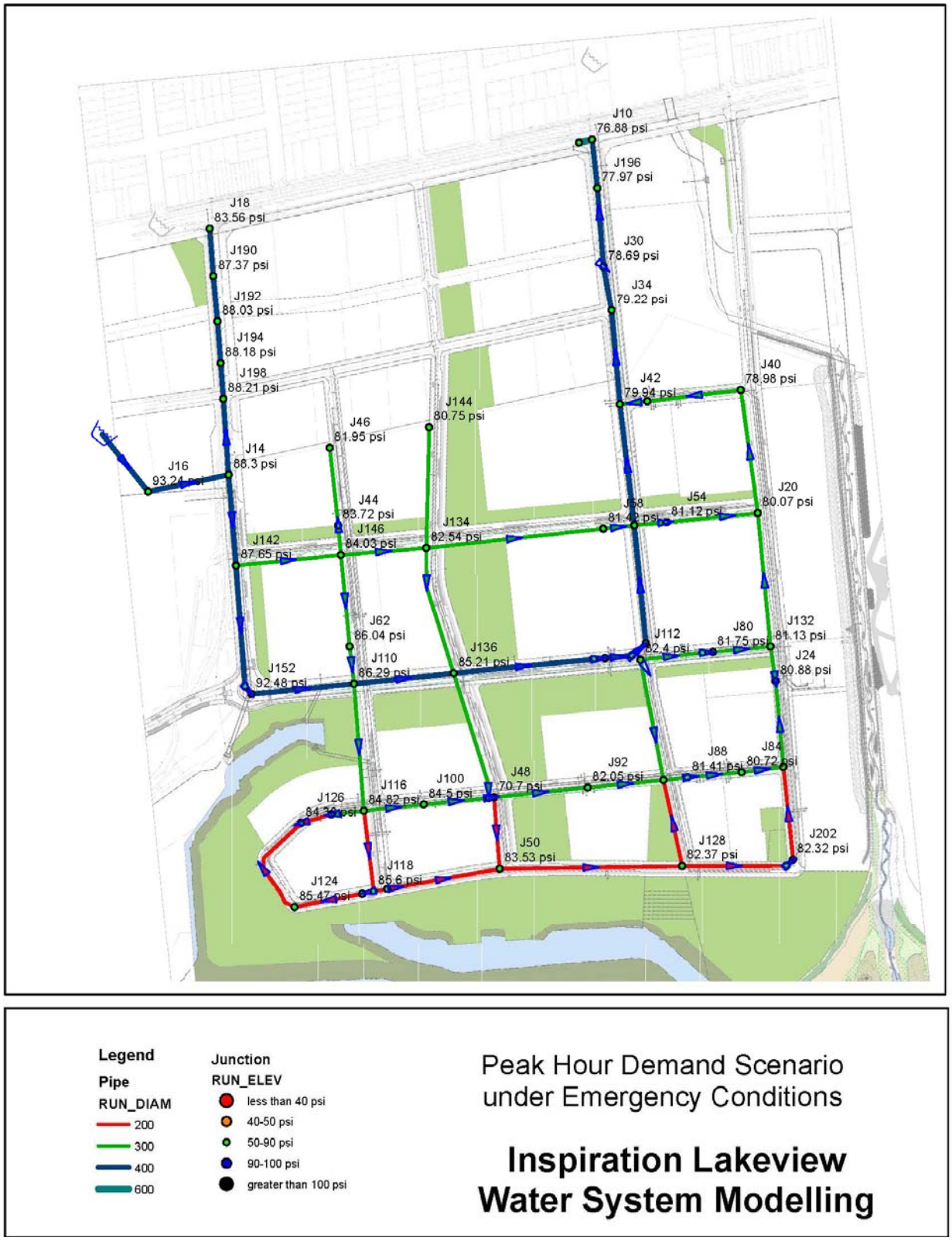


FIGURE 5 PEAK HOUR DEMAND UNDER EMERGENCY CONDITIONS



APPENDIX A


SANITARY SERVICING PLAN
LAKEVIEW COMMUNITY PARTNERS LTD.
CITY OF MISSISSAUGA
URBANTECH
LEGEND
G.E. BOOTH WASTEWATER TREATMENT FACILITY
LAKEVIEW WATER TREATMENT PLANT
LAKE ONTARIO
SERSON CREEK
LIMIT OF PROPERTY
EX. PLASTERFORM INC.
FUT. ROAD
EXISTING EMPLOYMENT
HYDRO ROAD
STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
STREET I
STREET J
FUTURE ROAD
RANGEVIEW ROAD
LAKESHORE ROAD EAST
LAKEFRONT PROMENADE
EX. LAKEFRONT PROMENADE PARK

APPENDIX B

PN 17201 1
Date 6-May-21
By CBL

		RESIDENTIAL		EMPLOYMENT
Design Criteria	ADD	265	Lpcd	265
	MDD Factor	1.8		1.4
	PHD Factor	3		3

Populations from this file: G:\Projects\2017\17201 - Lakeview Community - Mississauga\Design\SAN WATER\2021 05 06 - 17201 - CALC - Water and Wastewater.xlsx

				DMD 1						SCALE TO 7995		DMD 2			
Block Number	**Junction in Model**	**Residential Population**	**Combined**	**ADD**	**MDD**	**PHD**	**FF**		**Employment Population**	**Combined**	**MODIFIED**	**ADD**	**MDD**	**PHD**	**FF**
1	J44	380					*300*	J44	0	0	0				
2	J44	620	1000	3.07	5.52	9.20	*300*	J44	0	0	0				
3	J58	1,052	1052	3.23	5.81	9.68	*300*	J58	0	0	0				
4	J30	836	836	2.56	4.62	7.69	*300*	J30	0	0	0				
5	J54	384	384	1.18	2.12	3.53	*300*	J54	0	0	0				
6	J62	2,128		0.00			*300*	J62	0	0	0				
7	J62	2,161	4289	13.16	23.68	39.47	*300*	J62	101	101	108	0.33	0.46	0.99	
8	J64	2,712	2712	8.32	14.97	24.95	*300*	J64	0	0	0				
9	J74	2,220	2220	6.81	12.26	20.43	*300*	J74	0	0	0				
10	J104	1,161	1161	3.56	6.41	10.69	*300*	J104	0	0	0				
11	J126	1,367	1367	4.19	7.55	12.58	*300*	J126	69	69	74	0.23	0.32	0.68	
12	J100	1,745					*300*	J100	0	0	0				
13	J100	1,194	2939	9.01	16.22	27.04	*300*	J100	81	81	87	0.27	0.37	0.80	
14	J92	1,359					*300*	J92	81		0				
15	J92	1,056	2415	7.41	13.33	22.22	*300*	J92	66	147	157	0.48	0.67	1.44	
16	J88	956		0.00	0.00	0.00	*300*	J88	45		0				
17	J88	0	956	2.93	5.28	8.80	*300*	J88	36	81	87	0.27	0.37	0.80	
18	J196	711	711	2.18	3.93	6.54	*300*	J196	46	46	46	0.14	0.20	0.42	
19	J84	0					*300*	J84	152		0				
20	J84	0					*300*	J84	51	203	217	0.67	0.93	2.00	
21	J80	0					*300*	J80	55	55	59	0.18	0.25	0.54	
22	J24	0					*300*	J24	2,790	2790	2980	9.14	12.80	27.42	
23	J40	0					*300*	J40	200	200	214	0.66	0.92	1.97	
24	J20	0					*300*	J20	2,993	2993	3197	9.81	13.73	29.42	
39	J128	0	0	0.00	0.00	0.00	*300*	J128	551	551	589	1.81	2.53	5.42	
31 (park)	J134			0.00	0.00	0.00	*300*	J134	214	214	229	0.70	0.98	2.10	
		22042	22042	67.61	121.69	202.82	7800.00		7531	7531	8041	24.66	34.53	73.99	
Lakeview				67.61	121.69	202.82						24.66	34.53	73.99	
Externals - West				16.26	29.26	48.77						0.00			
Externals - East				14.56	26.21	43.69						0.00			
TOTAL				98.42	177.16	295.27						24.66	34.53	73.99	

PN 17201
Date 2020 09 08
By CL

	RESIDENTIAL	EMPLOYMENT	JUNCTION
Pvt 01	593	0	West
Pvt 02	492	0	West
Pvt 03	366	0	West
Pvt 04	468	0	West
Pvt 05	858	0	East
Pvt 06	346	0	West
Pvt 07	500	0	West
Pvt 08	297	0	West
Pvt 09	297	0	West
Pvt 10	534	0	West
Pvt 11	641	0	East
Pvt 12	649	0	West
Pvt 13	303	0	West
Pvt 14	347	0	West
Pvt 15	608	0	East
Pvt 16	1,493	0	East
Pvt 17	1,254	0	East
	10,048	0	



ADD	265	Lpcd
MDD Factor - Res	1.8	
MDD Factor - Empl	1.4	
PHD	3	

		POPULATION		DMD 1	DMD 2	DMD 1	DMD 2	DMD 1	DMD 2
JUNCTION		**RES**	**EMP**	**ADD RES**	**ADD EMP**	**MDD RES**	**MDD EMP**	**PHD RES**	**PHD EMP**
west	J198	5,300	0	16.26	0.00	29.26	0.00	48.77	0.00
east	J34	4,748	0	14.56	0.00	26.21	0.00	43.69	0.00
		10,048	0	30.82	0.00	55.47	0.00	92.46	0.00
				30.82		55.47		92.46	

APPENDIX C


KEY PLAN
LEGEND
PROPOSED 400mm WATERMAIN
PROPOSED 300mm WATERMAIN
PROPOSED 200mm WATERMAIN
EXISTING WATERMAIN
FUTURE WATERMAIN
NOTE:
THE EXISTING 400mm WATERMAIN SHOWN WITHIN THE EXISTING BASEMENT SHALL BE REPLACED BY A DEDICATED 400mm WATERMAIN ON LAKEFRONT PROMENADE, STREET B, AND STREET E AS SHOWN ON THIS PLAN. THE EXISTING WATERMAIN IS A DEDICATED FEED FROM THE WATER TREATMENT TO WASTEWATER TREATMENT PLANT AND SHALL REMAIN IN OPERATION UNTIL THE NEW 400mm WATERMAIN IS COMMISSIONED.
urbantech
LAKEVIEW COMMUNITY PARTNERS LTD.
CITY OF MISSISSAUGA
PRELIMINARY WATER SERVICING PLAN
PROJECT No. 17-549
DATE JAN. 2020
SCALE 1:2000
DWG No. WM-1
G.E. BOOTH WASTEWATER TREATMENT FACILITY
SERSON CREEK
LIMIT OF PROPERTY
HYDRO ROAD
STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
STREET I
STREET J
LAKEFRONT PROM.

APPENDIX D

17201 - Inspiration Lakeview Water Modelling - May 2021 InfoWater Output - Avg Day Demand Run				
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0	85	141.99	81.02
J100	9.31	80.1	141.7	87.57
J104	3.57	79.92	141.7	87.82
J110	0	79.47	141.72	88.49
J112	0	81.34	141.71	85.83
J114	0	81.23	141.72	85.99
J116	0	79.95	141.7	87.78
J118	0	79.36	141.7	88.63
J120	0	78.33	141.7	90.09
J122	0	79.33	141.7	88.66
J124	0	79.44	141.7	88.5
J126	4.44	80.21	141.69	87.41
J128	1.81	81.35	141.7	85.79
J130	0	82.01	141.7	84.86
J132	0	82.11	141.71	84.72
J134	0.7	81.8	141.73	85.19
J136	0	79.85	141.72	87.96
J138	0	82.78	141.7	83.76
J14	0	81.75	141.81	85.37
J142	0	80.35	141.77	87.31
J144	0	83.05	141.73	83.41
J146	0	81.26	141.73	85.97
J150	0	78.92	141.74	89.3
J152	0	75.92	141.74	93.56
J154	0	82.07	141.73	84.82
J156	0	81.32	141.72	85.85
J158	0	81.44	141.72	85.69
J160	0	85.04	141.99	80.96
J170	0	85.04	141.99	80.96
J18	0	85.04	141.99	80.96
J190	0	82.36	141.95	84.72
J192	0	81.89	141.91	85.32
J194	0	81.79	141.88	85.41
J196	2.33	84.23	141.94	82.04
J198	16.26	81.77	141.84	85.41
J20	9.81	82.84	141.72	83.7
J200	0	81.35	141.7	85.79
J202	0	81.35	141.7	85.79
J24	9.14	82.29	141.7	84.46
J30	2.57	83.73	141.86	82.64
J34	14.56	83.36	141.82	83.11
J38	0	82.86	141.76	83.74
J40	0.66	83.61	141.74	82.65
J42	0	82.93	141.77	83.64
J44	3.08	81.47	141.73	85.67
J46	0	82.71	141.73	83.9
J48	0	89.79	141.7	73.79
J50	0	80.75	141.7	86.64
J54	1.18	82.17	141.73	84.66
J58	3.24	82.05	141.73	84.84
J62	13.2	79.65	141.72	88.24
J64	8.68	81.1	141.72	86.17
J70	0	81.15	141.72	86.1
J74	6.83	81.63	141.71	85.4
J80	0.18	81.7	141.71	85.3
J84	0.67	82.46	141.7	84.21
J88	3.21	82	141.7	84.87
J92	7.91	81.61	141.7	85.42
J96	0	80.91	141.7	86.42

17201 - Inspiration Lakeview Water Modelling - May 2021 InfoWater Output - Max Day Demand Run				
ID	**Demand (L/s)**	**Elevation (m)**	**Head (m)**	**Pressure (psi)**
J10	0	85	141.98	81
J100	16.64	80.1	141.19	86.84
J104	6.43	79.92	141.18	87.09
J110	0	79.47	141.25	87.82
J112	0	81.34	141.23	85.14
J114	0	81.23	141.24	85.31
J116	0	79.95	141.19	87.05
J118	0	79.36	141.19	87.9
J120	0	78.33	141.19	89.37
J122	0	79.33	141.19	87.93
J124	0	79.44	141.18	87.77
J126	7.9	80.21	141.17	86.67
J128	2.53	81.35	141.19	85.08
J130	0	82.01	141.2	84.14
J132	0	82.11	141.21	84.02
J134	0.98	81.8	141.26	84.53
J136	0	79.85	141.24	87.28
J138	0	82.78	141.2	83.04
J14	0	81.75	141.48	84.9
J142	0	80.35	141.36	86.74
J144	0	83.05	141.26	82.75
J146	0	81.26	141.27	85.31
J150	0	78.92	141.3	88.68
J152	0	75.92	141.3	92.94
J154	0	82.07	141.28	84.17
J156	0	81.32	141.24	85.17
J158	0	81.44	141.24	85.01
J160	0	85.04	141.98	80.94
J170	0	85.04	141.98	80.94
J18	0	85.04	141.98	80.95
J190	0	82.36	141.87	84.6
J192	0	81.89	141.76	85.1
J194	0	81.79	141.66	85.11
J196	4.14	84.23	141.83	81.89
J198	29.27	81.77	141.57	85.02
J20	13.73	82.84	141.26	83.04
J200	0	81.35	141.2	85.08
J202	0	81.35	141.2	85.08
J24	12.8	82.29	141.2	83.75
J30	4.63	83.73	141.62	82.31
J34	26.21	83.36	141.51	82.67
J38	0	82.86	141.36	83.17
J40	0.92	83.61	141.31	82.04
J42	0	82.93	141.38	83.08
J44	5.54	81.47	141.27	85.01
J46	0	82.71	141.27	83.24
J48	0	89.79	141.2	73.07
J50	0	80.75	141.19	85.92
J54	2.12	82.17	141.27	84.01
J58	5.83	82.05	141.27	84.18
J62	23.76	79.65	141.24	87.56
J64	15.49	81.1	141.24	85.49
J70	0	81.15	141.24	85.42
J74	12.29	81.63	141.21	84.7
J80	0.25	81.7	141.21	84.6
J84	0.93	82.46	141.2	83.5
J88	5.66	82	141.2	84.15
J92	14.04	81.61	141.19	84.7
J96	0	80.91	141.2	85.7

17201 - Inspiration Lakeview Water Modelling - May 2021
InfoWater Output - Max Day Demand Run - Pipe Report

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)
24	J44	J146	37.79	300	120	-5.54	0.08	0	0.04
25	J112	J114	11.08	300	120	-27.51	0.39	0.01	0.68
26	J110	J116	162.84	300	120	19.26	0.27	0.06	0.35
27	J116	J118	103.23	200	120	0.87	0.03	0	0.01
28	J120	J118	17.79	200	120	1.66	0.05	0	0.03
29	J118	J122	14.95	200	120	2.54	0.08	0	0.06
30	J122	J124	88.59	200	120	2.54	0.08	0.01	0.06
31	J126	J124	144.09	200	120	-2.54	0.08	0.01	0.06
32	J120	J50	146.51	200	120	-1.66	0.05	0	0.03
33	J128	J130	112.4	200	120	-1.83	0.06	0	0.03
34	J130	J112	156.59	300	120	-13.93	0.2	0.03	0.19
35	J112	J74	79.98	300	120	13.58	0.19	0.01	0.18
36	J14	J198	97.33	400	120	-71.06	0.57	0.09	0.97
37	J136	J134	166.63	300	120	-11.63	0.16	0.02	0.14
38	J138	J24	110.22	300	120	-4.22	0.06	0	0.02
40	J142	J146	135.17	300	120	27.84	0.39	0.09	0.7
41	J134	J144	154.56	300	120	0	0	0	0
42	J126	J104	40.45	200	120	-5.36	0.17	0.01	0.24
6	J40	J38	120.78	300	120	-20.41	0.29	0.05	0.39
8	J48	J50	91.46	200	120	1.12	0.04	0	0.01
P101	RES9002	J18	64.43	600	120	114.25	0.4	0.02	0.33
P105	J18	J170	263.81	600	120	13.92	0.05	0	0.01
P107	J160	J10	17.35	600	120	13.92	0.05	0	0.01
P121	J170	J160	222.37	600	120	13.92	0.05	0	0.01
P13	J146	J134	109.84	300	120	7.32	0.1	0.01	0.06
P143	J190	J18	61.03	400	120	-100.33	0.8	0.11	1.85
P145	J192	J190	58.87	400	120	-100.33	0.8	0.11	1.85
P147	J194	J192	53.81	400	120	-100.33	0.8	0.1	1.85
P15	J146	J62	118.8	300	120	14.99	0.21	0.03	0.22
P155	J196	J30	100.45	400	120	107.63	0.86	0.21	2.1
P157	J198	J194	45.99	400	120	-100.33	0.8	0.08	1.85
P159	J128	J200	133.31	200	120	-1.24	0.04	0	0.02
P163	J202	J138	119.12	200	120	-1.24	0.04	0	0.02
P165	J136	J96	166.15	300	120	16.72	0.24	0.05	0.27
P167	J200	J202	11.25	200	120	-1.24	0.04	0	0.02
P17	J62	J110	47.94	300	120	-8.77	0.12	0	0.08
P19	J20	J54	117.59	300	120	-10.23	0.14	0.01	0.11
P21	J14	J142	116.76	400	120	71.06	0.57	0.11	0.97
P25	J150	J152	12.66	400	120	43.22	0.34	0	0.39
P27	J152	J110	132.14	400	120	43.22	0.34	0.05	0.39
P29	J110	J136	128.24	400	120	15.18	0.12	0.01	0.06
P31	J136	J64	180.81	400	120	10.09	0.08	0	0.03
P33	J64	J70	14.43	400	120	-5.4	0.04	0	0.01
P35	J70	J156	34.75	400	120	-5.4	0.04	0	0.01
P37	J156	J114	6.2	400	120	-5.4	0.04	0	0.01
P39	J114	J158	17.17	400	120	-32.91	0.26	0	0.23
P41	J158	J154	153.05	400	120	-32.91	0.26	0.04	0.23
P43	J154	J42	156.43	400	120	-56.39	0.45	0.1	0.64
P45	J42	J34	120.68	400	120	-76.79	0.61	0.14	1.13
P47	J34	J30	57.66	400	120	-103	0.82	0.11	1.94
P51	J134	J58	228.31	300	120	-5.3	0.07	0.01	0.03
P53	J58	J154	39.98	300	120	-11.13	0.16	0.01	0.13
P55	J104	J116	41.94	300	120	-11.79	0.17	0.01	0.14
P57	J116	J100	77.25	300	120	6.6	0.09	0	0.05
P59	J100	J96	84.08	300	120	-10.04	0.14	0.01	0.11
P61	J96	J48	6.45	300	120	6.68	0.09	0	0.05
P63	J48	J92	120.82	300	120	5.56	0.08	0	0.04
P65	J92	J130	97.59	300	120	-8.48	0.12	0.01	0.08
P69	J88	J84	69.9	300	120	-2.05	0.03	0	0.01
P71	J84	J138	53.85	300	120	-2.98	0.04	0	0.01
P73	J24	J132	44.79	300	120	-17.02	0.24	0.01	0.28
P75	J132	J20	172.6	300	120	-15.98	0.23	0.04	0.25
P77	J20	J40	159.11	300	120	-19.49	0.28	0.06	0.36
P79	J50	J128	234.05	200	120	-0.54	0.02	0	0
P81	J38	J42	35.3	300	120	-20.41	0.29	0.01	0.39
P83	J54	J154	41.53	300	120	-12.35	0.17	0.01	0.15
P85	J74	J80	13.52	300	120	1.29	0.02	0	0
P87	J80	J132	74.26	300	120	1.04	0.01	0	0
P89	J10	J196	62.59	400	120	111.77	0.89	0.14	2.26
P93	J88	J130	30.88	300	120	-3.61	0.05	0	0.02
P95	J142	J150	156.08	400	120	43.22	0.34	0.06	0.39
P97	J46	J44	100.05	300	120	0	0	0	0
P99	RES9006	J10	99.44	600	120	97.85	0.35	0.02	0.24

17201 - Inspiration Lakeview Water Modelling - May 2021 InfoWater Output - Peak Hour Demand Run				
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0	85	141.93	80.93
J100	27.93	80.1	139.69	84.72
J104	10.71	79.92	139.69	84.96
J110	0	79.47	139.87	85.86
J112	0	81.34	139.81	83.12
J114	0	81.23	139.83	83.31
J116	0	79.95	139.71	84.94
J118	0	79.36	139.7	85.78
J120	0	78.33	139.7	87.25
J122	0	79.33	139.7	85.82
J124	0	79.44	139.69	85.64
J126	13.32	80.21	139.66	84.52
J128	5.43	81.35	139.71	82.96
J130	0	82.01	139.72	82.03
J132	0	82.11	139.76	81.94
J134	2.1	81.8	139.91	82.61
J136	0	79.85	139.85	85.29
J138	0	82.78	139.71	80.93
J14	0	81.75	140.53	83.56
J142	0	80.35	140.21	85.1
J144	0	83.05	139.91	80.83
J146	0	81.26	139.93	83.41
J150	0	78.92	140.03	86.87
J152	0	75.92	140.02	91.11
J154	0	82.07	139.94	82.27
J156	0	81.32	139.83	83.17
J158	0	81.44	139.84	83.02
J160	0	85.04	141.93	80.88
J170	0	85.04	141.94	80.89
J18	0	85.04	141.94	80.89
J190	0	82.36	141.63	84.25
J192	0	81.89	141.32	84.48
J194	0	81.79	141.05	84.23
J196	6.99	84.23	141.53	81.46
J198	48.78	81.77	140.81	83.93
J20	29.43	82.84	139.87	81.06
J200	0	81.35	139.71	82.96
J202	0	81.35	139.71	82.96
J24	27.42	82.29	139.72	81.63
J30	7.71	83.73	140.94	81.33
J34	43.68	83.36	140.62	81.4
J38	0	82.86	140.18	81.5
J40	1.98	83.61	140.04	80.22
J42	0	82.93	140.23	81.45
J44	9.24	81.47	139.93	83.11
J46	0	82.71	139.93	81.34
J48	0	89.79	139.71	70.97
J50	0	80.75	139.71	83.81
J54	3.54	82.17	139.92	82.09
J58	9.72	82.05	139.93	82.28
J62	39.6	79.65	139.86	85.59
J64	26.04	81.1	139.83	83.49
J70	0	81.15	139.83	83.42
J74	20.49	81.63	139.76	82.63
J80	0.54	81.7	139.76	82.53
J84	2.01	82.46	139.71	81.39
J88	9.63	82	139.71	82.04
J92	23.73	81.61	139.7	82.58
J96	0	80.91	139.72	83.59

17201 - Inspiration Lakeview Water Modelling - May 2021 - Max Daily Demand with Fireflow Simulation Run

Note:- At any given node the Available Flow (at 140 kPa/20 psi) must be greater than Total demand.

ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (psi)	Available Flow at Hydrant (L/s)	Available Flow Pressure (psi)
J100	16.64	86.84	141.19	300	76.51	958.97	20.31
J104	6.43	87.09	141.18	300	74.22	815.54	20.3
J126	7.9	86.67	141.17	300	61.36	532.60	20.3
J128	2.53	85.08	141.19	300	62.77	556.76	20.3
J134	0.98	84.53	141.26	300	77.15	1,142.28	20.31
J194	0	85.11	141.66	300	81.65	1,888.24	20.31
J196	4.14	81.89	141.83	300	80.03	2,710.09	20.31
J20	13.73	83.04	141.26	300	75.15	1,090.90	20.31
J24	12.8	83.75	141.2	300	74.12	965.73	20.31
J30	4.63	82.31	141.62	300	78.81	1,867.18	20.31
J34	26.21	82.67	141.51	300	78.50	1,701.62	20.31
J40	0.92	82.04	141.31	300	72.78	935.17	20.31
J44	5.54	85.01	141.27	300	74.83	912.19	20.31
J54	2.12	84.01	141.27	300	76.67	1,145.08	20.31
J58	5.83	84.18	141.27	300	76.73	1,137.01	20.31
J62	23.76	87.56	141.24	300	79.80	1,172.44	20.31
J64	15.49	85.49	141.24	300	78.83	1,291.49	20.31
J74	12.29	84.7	141.21	300	75.8	1,028.76	20.31
J80	0.25	84.6	141.21	300	75.63	1,008.51	20.31
J84	0.93	83.5	141.2	300	73.13	900.97	20.31
J88	5.66	84.15	141.2	300	74.60	969.62	20.31
J92	14.04	84.7	141.19	300	74.44	939.27	20.31

17201 - Inspiration Lakeview Water Modelling - May 2021 InfoWater Output - Peak Hour Demand Run Emergency Conditions				
ID	**Demand (L/s)**	**Elevation (m)**	**Head (m)**	**Pressure (psi)**
J10	0	85	139.08	76.88
J100	27.93	80.1	139.54	84.5
J104	10.71	79.92	139.6	84.84
J110	0	79.47	140.17	86.29
J112	0	81.34	139.3	82.4
J114	0	81.23	139.32	82.58
J116	0	79.95	139.62	84.82
J118	0	79.36	139.57	85.6
J120	0	78.33	139.56	87.05
J122	0	79.33	139.57	85.63
J124	0	79.44	139.57	85.47
J126	13.32	80.21	139.56	84.38
J128	5.43	81.35	139.29	82.37
J130	0	82.01	139.29	81.43
J132	0	82.11	139.19	81.13
J134	2.1	81.8	139.86	82.54
J136	0	79.85	139.79	85.21
J138	0	82.78	139.23	80.25
J14	0	81.75	143.87	88.3
J142	0	80.35	142	87.65
J144	0	83.05	139.86	80.75
J146	0	81.26	140.36	84.03
J150	0	78.92	141.05	88.32
J152	0	75.92	140.98	92.48
J154	0	82.07	139.26	81.31
J156	0	81.32	139.33	82.46
J158	0	81.44	139.31	82.27
J16	0	80.46	146.05	93.24
J160	0	85.04	139.08	76.82
J18	0	85.04	143.82	83.56
J190	0	82.36	143.82	87.37
J192	0	81.89	143.82	88.03
J194	0	81.79	143.82	88.18
J196	6.99	84.23	139.08	77.97
J198	48.78	81.77	143.82	88.21
J20	29.43	82.84	139.17	80.07
J200	0	81.35	139.26	82.33
J202	0	81.35	139.26	82.32
J24	27.42	82.29	139.19	80.88
J30	7.71	83.73	139.08	78.69
J34	43.68	83.36	139.08	79.22
J38	0	82.86	139.17	80.05
J40	1.98	83.61	139.17	78.98
J42	0	82.93	139.16	79.94
J44	9.24	81.47	140.36	83.72
J46	0	82.71	140.36	81.95
J48	0	89.79	139.53	70.7
J50	0	80.75	139.51	83.53
J54	3.54	82.17	139.23	81.12
J58	9.72	82.05	139.33	81.42
J62	39.6	79.65	140.17	86.04
J64	26.04	81.1	139.39	82.87
J70	0	81.15	139.37	82.77
J74	20.49	81.63	139.21	81.85
J80	0.54	81.7	139.21	81.75
J84	2.01	82.46	139.25	80.72
J88	9.63	82	139.27	81.41
J92	23.73	81.61	139.33	82.05

Appendix B-2

E-mail Correspondence with the Region of Peel: Equivalent Population Values

Jonathan Nishio

From: Janaani Pathmanapan
Sent: October 3, 2022 10:17 AM
To: Jonathan Nishio
Subject: FW: Request for some information - San Trunk under Lakeshore Road East draining to Beechwood SPS

Hi Jonathan,

We received a response back for the townhouse densities – 3.5ppu

---

From: Motamedi, Kolsoom <kolsoom.motamedi@peelregion.ca>
Sent: October 3, 2022 10:03 AM
To: Koryun Shahbikian <kshahbikian@schaeffers.com>; Polga, Miriam <miriam.polga@peelregion.ca>; Borowiec, Laura <laura.borowiec@peelregion.ca>; Lee, Justin <Justin.Lee@peelregion.ca>; Leyburne, Troy <troy.leyburne@peelregion.ca>
Cc: Michael May <mikem@deltaurban.com>; Andrew Lam <andrewl@deltaurban.com>; Myron Pestaluky <myronp@deltaurban.com>; Hovig Tozcu <hhtozcu@schaeffers.com>; Janaani Pathmanapan <jpathmanapan@schaeffers.com>; Heather Milukow <hmilukow@schaeffers.com>; LeDrew, Lyle <lyle.ledrew@peelregion.ca>
Subject: RE: Request for some information - San Trunk under Lakeshore Road East draining to Beechwood SPS

Hi Koryun,

For your information, The plan is that all flow from the Beach Street Sewage Pumping Station drainage areas will be conveyed by gravity to the Beechwood SPS, through the proposed Aviation Trunk and Lakeshore Road East trunk.
My understanding is that the entire flow from the Rangeview development is planned to be conveyed to the future Lakeshore Road gravity sewer.
For the townhouse please use 3.5 people per unit.

Thanks and Regards,

Kolsoom Motamedi, P.Eng., PMP
Project Manager
Infrastructure Planning - Growth
Public Works, Region of Peel
10 Peel Centre Drive, Suite A, 4th Floor
Brampton, ON L6T 4B9
Tel. (905) 791-7800, ext. 4196
Kolsoom.Motamedi@peelregion.ca

From: Koryun Shahbikian <kshahbikian@schaeffers.com>
Sent: Monday, October 3, 2022 9:46 AM

To: Motamedi, Kolsoom <kolsoom.motamedi@peelregion.ca>; Polga, Miriam <miriam.polga@peelregion.ca>; Borowiec, Laura <laura.borowiec@peelregion.ca>; Lee, Justin <Justin.Lee@peelregion.ca>; Leyburne, Troy <troy.leyburne@peelregion.ca>
Cc: Michael May <mikem@deltaurban.com>; Andrew Lam <andrewl@deltaurban.com>; Myron Pestaluky <myronp@deltaurban.com>; Hovig Tozcu <hhtozcu@schaeffers.com>; Janaani Pathmanapan <jpathmanapan@schaeffers.com>; Heather Milukow <hmilukow@schaeffers.com>; LeDrew, Lyle <lyle.ledrew@peelregion.ca>
Subject: RE: Request for some information - San Trunk under Lakeshore Road East draining to Beechwood SPS

CAUTION: EXTERNAL MAIL. DO NOT CLICK ON LINKS OR OPEN ATTACHMENTS YOU DO NOT TRUST.

Hi Kolsoom,
Thanks for your prompt reply.
I will try to provide some clarifications but we will try to provide answers to all your four items through a separate email later.
Concerning item 4, we estimated the population based on units but we used the ppu that we got from the region for another project. The ppu was slightly less than what you have mentioned so we are going to revise our population based on 2.7 ppu per apartment unit. Please also let us know what ppu we should consider for townhouses.
Concerning trunk sewer, in our previous meetings with the region, we were told that all flows from range view should be drained to Beechwood SPS. If you recall, we originally had a plan to split the flow and use the lakeshore trunk as well as Beach Street SPS.
I will talk to LOG for phasing questions and we will provide information.
Thanks,

Koryun Shahbikian, LLB, LLM, M.Eng., P.Eng.
Partner

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---

From: Motamedi, Kolsoom <kolsoom.motamedi@peelregion.ca>
Sent: October 3, 2022 9:00 AM
To: Koryun Shahbikian <kshahbikian@schaeffers.com>; Polga, Miriam <miriam.polga@peelregion.ca>; Borowiec, Laura <laura.borowiec@peelregion.ca>; Lee, Justin <Justin.Lee@peelregion.ca>; Leyburne, Troy

<troy.leyburne@peelregion.ca>
Cc: Michael May <mikem@deltaurban.com>; Andrew Lam <andrewl@deltaurban.com>; Myron Pestaluky <myronp@deltaurban.com>; Hovig Tozcu <hhtozcu@schaeffers.com>; Janaani Pathmanapan <jpathmanapan@schaeffers.com>; Heather Milukow <hmilukow@schaeffers.com>; LeDrew, Lyle <lyle.ledrew@peelregion.ca>
Subject: RE: Request for some information - San Trunk under Lakeshore Road East draining to Beechwood SPS

Hi Koryun,

Thank you for updating us about Rangview development. Troy Leyburne is the project manager for this project, so I have copied him and also Lyle LeDrew, Manager of wastewater Engineering Service.
The detailed drawings are not ready yet. I had a meeting with Engineering Service and the following information should be clarified.

1- Rangeview project phasing, when service be required
2- Coordination with regards to the connection point location
3- What is your plan for conveying sanitary flows to the future trunk on Lakeshore Road East
4- The final proposed population, at this stage people per unit, be considered (2.7 ppu for apartment buildings and 4.2 for single detached)

Please do not hesitate to contact me if you have any questions.

Thanks and Regards,

Kolsoom Motamedi, P.Eng., PMP
Project Manager
Infrastructure Planning - Growth
Public Works, Region of Peel
10 Peel Centre Drive, Suite A, 4th Floor
Brampton, ON L6T 4B9
Tel. (905) 791-7800, ext. 4196
Kolsoom.Motamedi@peelregion.ca

From: Koryun Shahbikian <kshahbikian@schaeffers.com>
Sent: Saturday, October 1, 2022 9:21 AM
To: Motamedi, Kolsoom <kolsoom.motamedi@peelregion.ca>; Polga, Miriam <miriam.polga@peelregion.ca>; Borowiec, Laura <laura.borowiec@peelregion.ca>; Lee, Justin <Justin.Lee@peelregion.ca>
Cc: Michael May <mikem@deltaurban.com>; Andrew Lam <andrewl@deltaurban.com>; Myron Pestaluky <myronp@deltaurban.com>; Hovig Tozcu <hhtozcu@schaeffers.com>; Janaani Pathmanapan <jpathmanapan@schaeffers.com>; Heather Milukow <hmilukow@schaeffers.com>
Subject: RE: Request for some information - San Trunk under Lakeshore Road East draining to Beechwood SPS

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Appendix B-3

Water Demand Calculations

Water Supply Calculations

Project Title: 4938 - Rangeview
Last Edited: 2022-10-28

Municipality Region of Peel

Project: 4938 Rangeview Mississauga
2022-10-28

Design Criteria

Unit Type	Population Density	Unit	Source
Rowhouses/Other Multiples	3.5	ppu	Per correspondence with Region of Peel (Oct 3, 2022)
Apartment	2.7	ppu	Per correspondence with Region of Peel (Oct 3, 2022)

Land Use	Population Density	Unit	Source
Single Family (>10m frontage)	50	ppha	Per Region of Peel Sanitary Sewer Design Criteria (July 2009)
Single Family (<10m frontage)	70	ppha	Per Region of Peel Sanitary Sewer Design Criteria (July 2009)
Semi-detached	70	ppha	Per Region of Peel Sanitary Sewer Design Criteria (July 2009)
Row dwellings	175	ppha	Per Region of Peel Sanitary Sewer Design Criteria (July 2009)
Apartments	475	ppha	Per Region of Peel Sanitary Sewer Design Criteria (July 2009)

							Townhouse Units					**Mid-rise Units**	**Tall Building Units**	**Equivalent Population**					
							Townhouses	*Back-to-Back Townhouses*	*Stacked Townhouses*	*Stacked Back-to-Back Townhouses*	*Apartments*	*Mid-rise Buildings*	*Tall Buildings*	*Unit Type Method*			*Land Use Method*		
Parcel	**Landowners**	**Parcel Area (Gross)**		**Net Developable**		**Parcel Area (Townhouse)**	**Parcel Area (Apartments)**	*(Up to 4-Storeys)*					*(5- to 8-Storeys)*	*(9- to 15-Storeys)*	**Townhouses**	**Apartments**	**Total**	**Townhouses**	**Apartments**	**Total**
		sq.m.	*ha*	*sq.m.*	*ha*	*ha*	*ha*								*persons*	*persons*	*persons*	*persons*	*persons*	*persons*
1	ELGROUP HOLDINGS INC./ELIAS BROS. CONSTRUCTION LIMITED (Elias Brothers Construction)	6,198.99	0.62	5,211.39	0.52		0.52					204	62		719	719		247	247
2	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	8,451.90	0.85	7,632.77	0.77	0.32	0.45			48		159		168	430	598	56	214	270
3	1127792 ONTARIO LIMITED (Dino Collini)	4,339.04	0.43	3,868.37	0.38		0.38					145			392	392		181	181
4	*896 Lakeshore Road East*	4,338.68	0.43	3,868.33	0.38		0.38					142			384	384		181	181
5	*910 - 920 Lakeshore Road East*	8,686.81	0.87	5,244.66	0.52		0.52					170	62		627	627		247	247
6	*946 Lakeshore Road East*	7,040.36	0.70	5,723.87	0.57		0.57					179	62		651	651		271	271
7	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	10,735.57	1.07	9,334.79	0.93	0.77	0.16		22	44		135		231	365	596	135	76	211
8	447111 ONTARIO LIMITED (Norstar)	7,833.20	0.78	7,133.15	0.71	0.54	0.17		12	24		138		126	373	499	95	81	176
9	RANGEVIEW 1035 HOLDING INC./RANGEVIEW 1045 HOLDING INC./1207238 ONTARIO INC. (Oasis Banquet Hall)	8,590.92	0.86	2,089.15	0.21		0.21					96	62		427	427		100	100
10	ILSCO OF CANADA LIMITED (Thomas Quinn)	6,980.11	0.70	5,820.65	0.59		0.59					197	62		700	700		281	281
11	*1076 Lakeshore Road East*	13,573.97	1.36	8,924.70	0.90	0.52	0.38	12				216	62	42	751	793	91	181	272
12	ELGROUP HOLDINGS INC./ELIAS BROS. CONSTRUCTION LIMITED (Elias Brothers Construction)	15,357.62	1.54	8,586.32	0.86	0.45	0.41			68		159		238	430	668	79	195	274
13	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	4,189.30	0.42	2,036.86	0.20	0.20		10						35		35	35		35
14	*895 Rangeview Road*	4,465.52	0.45	3,975.17	0.40	0.40			22					77		77	70		70
15	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	5,653.29	0.57	3,403.54	0.34		0.34					148	62		567	567		162	162
16	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	7,259.45	0.73	7,109.98	0.72	0.27	0.45			20		194	62	70	692	762	48	214	262
17	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	3,627.10	0.36	1,120.74	0.11	0.11				40				140		140	20		20
18	2547046 ONTARIO INC./2545488 ONTARIO INC. (Vittorio Torchia)	3,627.76	0.36	1,856.79	0.18	0.18			18					63		63	32		32
19	DORSAY (LAKESHORE) INC./DORSAY (LAKEFRONT PROMENADE) INC./DORSAY (RANGEVIEW) INC.	5,075.55	0.51	3,554.25	0.36		0.36					154	62		584	584		171	171
20	RANGEVIEW 1035 HOLDING INC./RANGEVIEW 1045 HOLDING INC./1207238 ONTARIO INC. (Oasis Banquet Hall)	4,587.89	0.46	1,612.07	0.16		0.16					155	62		586	586		76	76
21	RANGEVIEW 1035 HOLDING INC./RANGEVIEW 1045 HOLDING INC./1207238 ONTARIO INC. (Oasis Banquet Hall)	4,829.66	0.48	4,205.37	0.42	0.42			18					63		63	74		74
22	2547046 ONTARIO INC./2545488 ONTARIO INC. (Vittorio Torchia)	6,054.50	0.61	5,493.77	0.55	0.27	0.28		16			144	62	56	557	613	48	133	181
23	*850 Rangeview Road*	10,354.01	1.04	9,964.00	1.00		1.00	16	20		54			126	146	272		475	475
24	WHITEROCK 880 RANGEVIEW INC. (Dream)	13,146.95	1.31	12,996.05	1.29		1.29	12	36			160	62	168	600	768		613	613
25	*890 Rangeview Road (Canada Post)*	8,627.44	0.86	6,034.17	0.60		0.60		14			120	62	49	492	541		285	285
26	ELGROUP HOLDINGS INC./ELIAS BROS. CONSTRUCTION LIMITED (Elias Brothers Construction)	7,258.96	0.73	7,128.45	0.72	0.14	0.58		16			212	62	56	740	796	25	276	301
27	ELGROUP HOLDINGS INC./ELIAS BROS. CONSTRUCTION LIMITED (Elias Brothers Construction)	3,621.46	0.36	2,087.67	0.21														
28	ELGROUP HOLDINGS INC./ELIAS BROS. CONSTRUCTION LIMITED (Elias Brothers Construction)	3,625.21	0.36	3,573.98	0.35	0.12	0.23		16			81		56	219	275	21	110	131
29	*1008 Rangeview Road*	3,621.63	0.36	3,569.56	0.35		0.35					108	62		459	459		167	167
30	*1024 Rangeview Road*	3,623.21	0.36	276.43	0.02														
31	2120412 ONTARIO INC. (Xtreme Tire)	7,248.77	0.72	6,069.05	0.60	0.27	0.33	5	12			138	62	60	540	600	48	157	205
32	*1062 Rangeview Road*	3,273.04	0.33	3,232.41	0.33	0.33		5	12					60		60	58		58
33	KOTYCK INVESTMENTS LTD. (Laurie McPherson)	3,491.56	0.35	3,244.53	0.33		0.33					100	62		438	438		157	157
	TOTALS	**219,389.45**	**21.94**	**165,982.98**	**16.58**	**5.31**	**11.04**	**60**	**150**	**84**	**244**	**54**	**3,654**	**1,054**	**1,884**	**12,869**	**14,753**	**935**	**5,251**	**6,186**

LEGEND
Non-participating Landowners

Water Supply Calculations

Project Title: 4938 - Rangeview
Last Edited: 2022-10-28

Municipality Region of Peel

Water Supply Parameters

Residential Parameters

Water Demand	280	L/cap./d
Max Day Factor	2.0	
Peak Hour Factor	3.0	

ICI Parameters

Water Demand	300	L/cap./d
Max Day Factor	1.4	
Peak Hour Factor	3.0	

Water Demand

Residential	280	L/cap./d	Per Region of Peel Watermain Design Criteria (June 2010)
ICI	300	L/emp./d	Per Region of Peel Watermain Design Criteria (June 2010)

Peaking Factors

Residential Max Day Factor	2.00	Per Region of Peel Watermain Design Criteria (June 2010)
Residential Peak Hour Factor	3.00	Per Region of Peel Watermain Design Criteria (June 2010)
ICI Max Day Factor	1.40	Per Region of Peel Watermain Design Criteria (June 2010)
ICI Peak Hour Factor	3.00	Per Region of Peel Watermain Design Criteria (June 2010)

Demands - Rangeview Non-participating Landowners

*Population data per Rangeview Statistics from Bousefield (September 30, 2022)

Parcel	Residential Population	Flow (L/s)				
		Average Day Demand	*Max Day Demand*	*Peak Hour Demand*	*Fire Flow*	*MDD + Fire Flow*
1	719	2.33	4.66	6.99	317	321.66
2	598	1.94	3.88	5.81	317	320.88
3	392	1.27	2.54	3.81	317	319.54
4	384	1.24	2.49	3.73	317	319.49
5	627	2.03	4.06	6.10	317	321.06
6	651	2.11	4.22	6.33	317	321.22
7	596	1.93	3.86	5.79	317	320.86
8	499	1.62	3.23	4.85	317	320.23
9	427	1.38	2.77	4.15	317	319.77
10	700	2.27	4.54	6.81	317	321.54
11	793	2.57	5.14	7.71	317	322.14
12	668	2.16	4.33	6.49	317	321.33
13	35	0.11	0.23	0.34	317	317.23
14	77	0.25	0.50	0.75	317	317.50
15	567	1.84	3.68	5.51	317	320.68
16	762	2.47	4.94	7.41	317	321.94
17	140	0.45	0.91	1.36	317	317.91
18	63	0.20	0.41	0.61	317	317.41
19	584	1.89	3.79	5.68	317	320.79
20	586	1.90	3.80	5.70	317	320.80
21	63	0.20	0.41	0.61	317	317.41
22	613	1.99	3.97	5.96	317	320.97
23	272	0.88	1.76	2.64	317	318.76
24	768	2.49	4.98	7.47	317	321.98
25	541	1.75	3.51	5.26	317	320.51
26	796	2.58	5.16	7.74	317	322.16
27		0.00	0.00	0.00	317	317.00
28	275	0.89	1.78	2.67	317	318.78
29	459	1.49	2.98	4.46	317	319.98
30		0.00	0.00	0.00	317	317.00
31	600	1.94	3.89	5.83	317	320.89
32	60	0.19	0.39	0.58	317	317.39
33	438	1.42	2.84	4.26	317	319.84
Total	14753	47.81	95.62	143.43		

Residential Demands - Lakeview

*Population data per TMIG Lakeview Community Water Modelling Methodology and Analysis Memo (May 6, 2021)

Block Number	Residential Population	Flow (L/s)				
		Average Day Demand	*Max Day Demand*	*Peak Hour*	*Fire Flow*	*MDD + Fire Flow*
1	380	1.23	2.46	3.69	300	302.46
2	620	2.01	4.02	6.03	300	304.02
3	1052	3.41	6.82	10.23	300	306.82
4	836	2.71	5.42	8.13	300	305.42
5	384	1.24	2.49	3.73	300	302.49
6	2128	6.90	13.79	20.69	300	313.79
7	2161	7.00	14.01	21.01	300	314.01
8	2712	8.79	17.58	26.37	300	317.58
9	2220	7.19	14.39	21.58	300	314.39
10	1161	3.76	7.53	11.29	300	307.53
11	1367	4.43	8.86	13.29	300	308.86
12	1745	5.66	11.31	16.97	300	311.31
13	1194	3.87	7.74	11.61	300	307.74
14	1359	4.40	8.81	13.21	300	308.81
15	1056	3.42	6.84	10.27	300	306.84
16	956	3.10	6.20	9.29	300	306.20
17	0	0.00	0.00	0.00	300	300.00
18	711	2.30	4.61	6.91	300	304.61
19	0	0.00	0.00	0.00	300	300.00
20	0	0.00	0.00	0.00	300	300.00
21	0	0.00	0.00	0.00	300	300.00
22	0	0.00	0.00	0.00	300	300.00
23	0	0.00	0.00	0.00	300	300.00
24	0	0.00	0.00	0.00	300	300.00
39	0	0.00	0.00	0.00	300	300.00
31 (park)	0	0.00	0.00	0.00	300	300.00
Total	**22042**	**71.43**	**142.86**	**214.30**		

Employment Demands - Lakeview

*Population data per TMIG Lakeview Community Water Modelling Methodology and Analysis Memo (May 6, 2021)

Block Number	Employment Population	Flow (L/s)		
		Average Day Demand	*Max Day Demand*	*Peak Hour Demand*
1	0	0.00	0.00	0.00
2	0	0.00	0.00	0.00
3	0	0.00	0.00	0.00
4	0	0.00	0.00	0.00
5	0	0.00	0.00	0.00
6	0	0.00	0.00	0.00
7	108	0.35	0.49	1.05
8	0	0.00	0.00	0.00
9	0	0.00	0.00	0.00
10	0	0.00	0.00	0.00
11	74	0.24	0.34	0.72
12	0	0.00	0.00	0.00
13	87	0.28	0.39	0.85
14	0	0.00	0.00	0.00
15	157	0.51	0.71	1.53
16	0	0.00	0.00	0.00
17	87	0.28	0.39	0.85
18	46	0.15	0.21	0.45
19	0	0.00	0.00	0.00
20	217	0.70	0.98	2.11
21	59	0.19	0.27	0.57
22	2980	9.66	13.52	28.97
23	214	0.69	0.97	2.08
24	3197	10.36	14.50	31.08
39	589	1.91	2.67	5.73
31 (park)	229	0.74	1.04	2.23
Total	**8044**	**26.07**	**36.50**	**78.21**

Demands - External Lands per Lakeview Report, PVT 16/17

*Population data per TMIG Lakeview Community Water Modelling Methodology and Analysis Memo (May 6, 2021)

ID	Residential Population	Flow (L/s)				
		Average Day Demand	*Max Day Demand*	*Peak Hour Demand*	*Fire Flow*	*MDD + Fire Flow*
Pvt 16	1493	4.84	9.68	14.52	300	309.68
Pvt 17	1254	4.06	8.13	12.19	300	308.13
Total	**2747**	**8.90**	**17.80**	**26.71**		

Appendix B-4

Hydrant Test Results

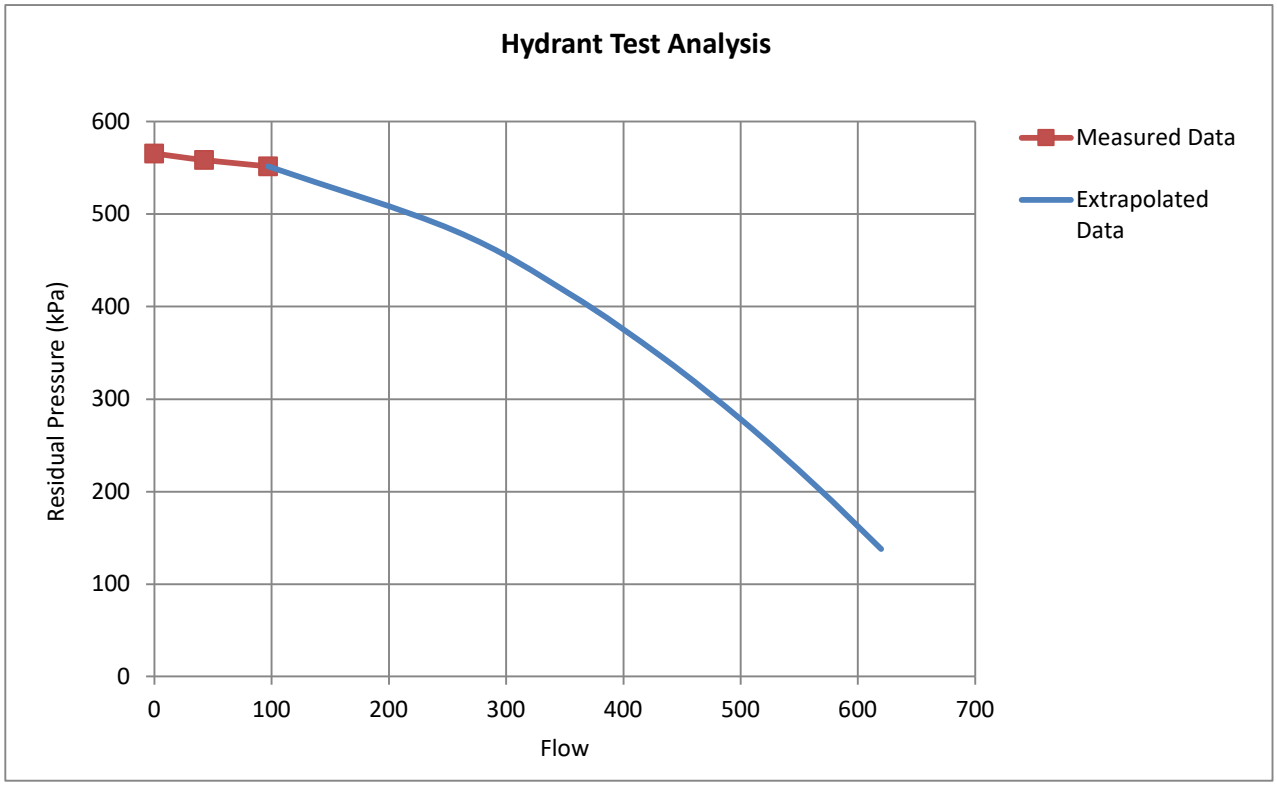
Rangeview Mississauga

Project No. 4938

Date of Test: 04/23/2021
Test Location: Residual: 1000 Lakeshore Road East, Mississauga
Flow: 1000 Lakeshore Road East, Mississauga

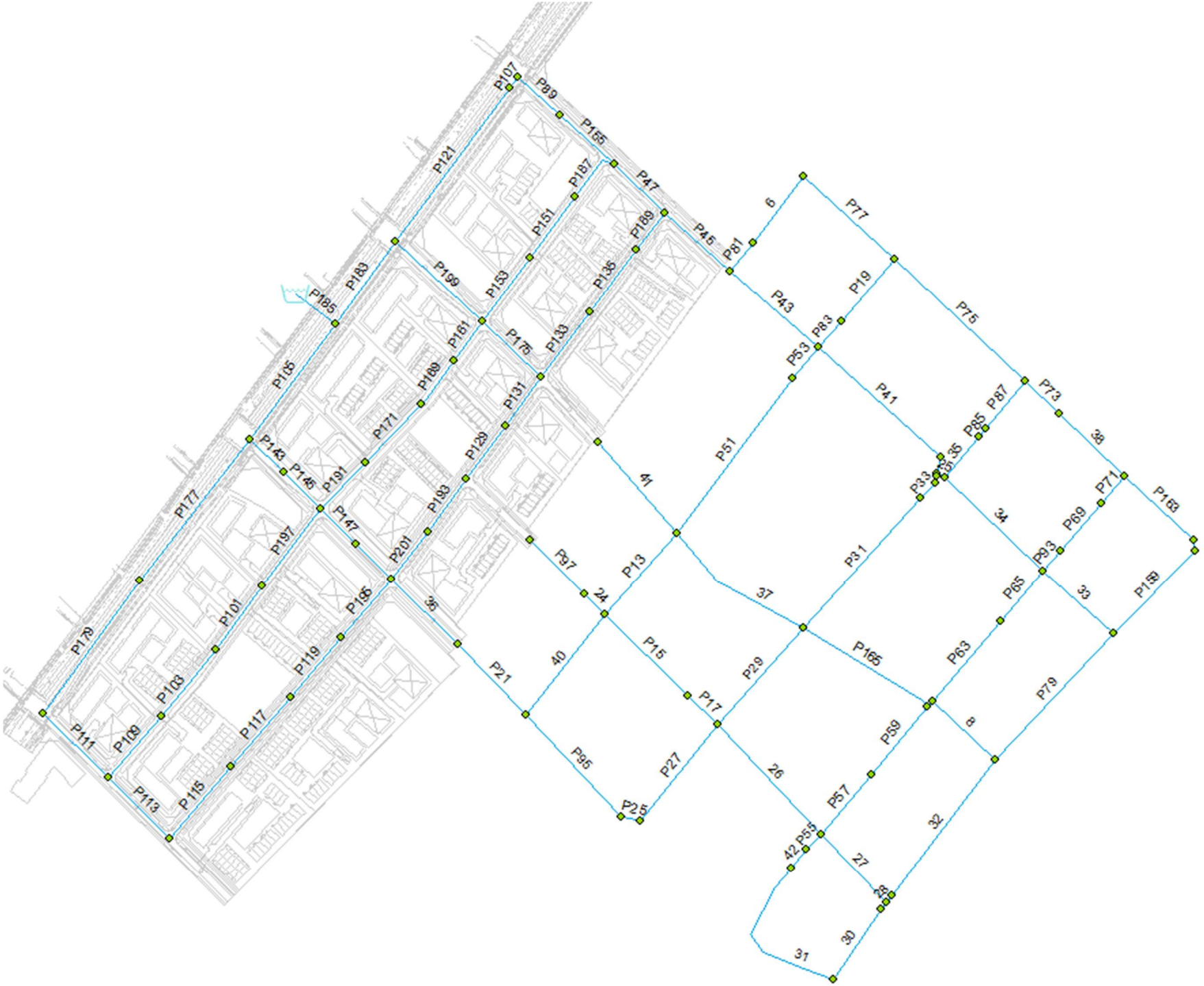
Test Results

	Flow		Residual Pressure	
	US. GPM	L/s	psi	kPa
Measured Data	0	0	82	565
	674	43	81	558
	1538	97	80	552
Extrapolated Data	4047	255	70	483
	5614	354	60	414
	6874	434	50	345
	7961	502	40	276
	8934	564	30	207
	9824	620	20	138



Appendix B-5

InfoWater Model Outputs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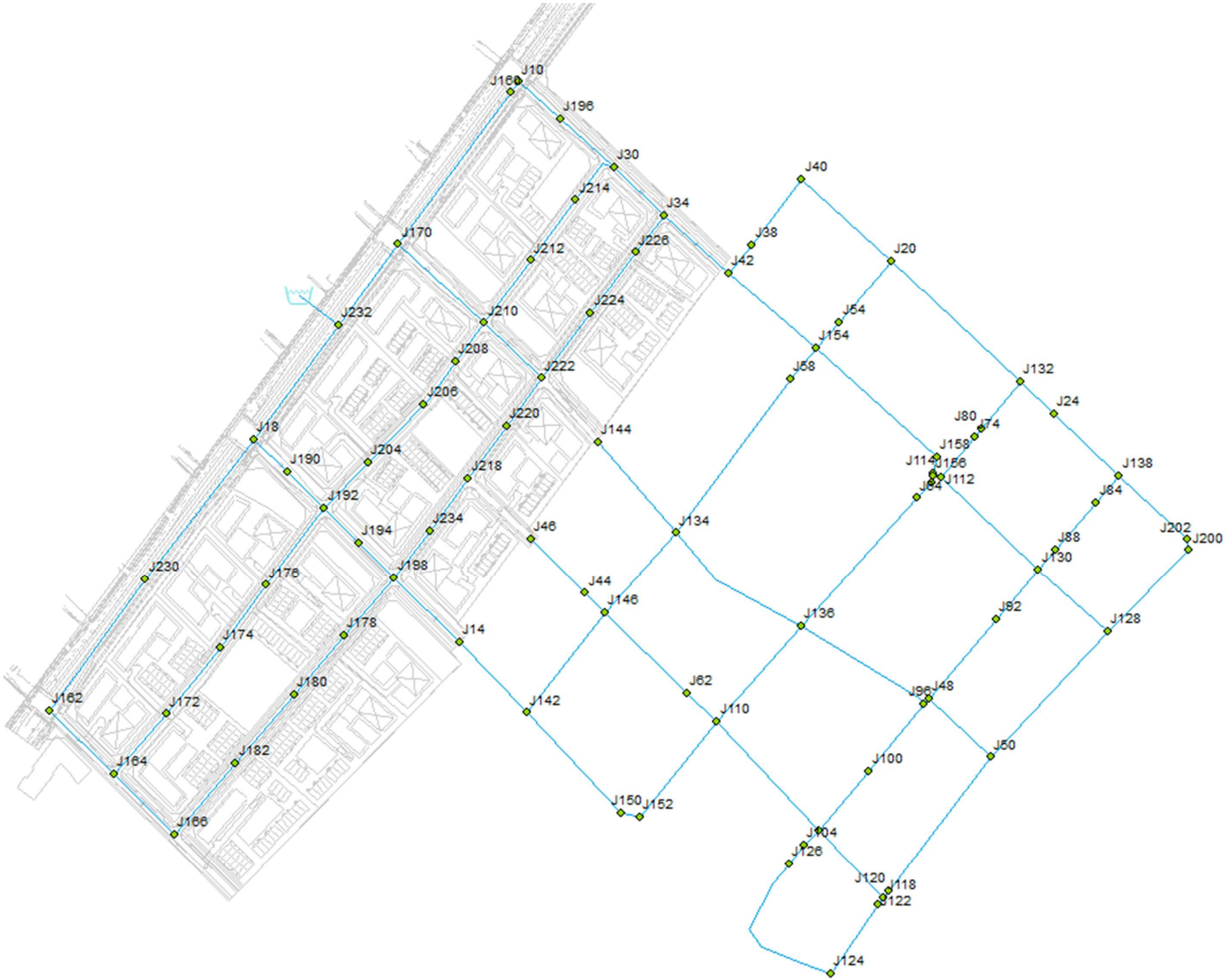
P121
P187
P47
P151
P189
P45
P81
6
P77
P183
P199
P153
P135
P19
P185
P43
P75
P161
P175
P133
P83
P53
P105
P189
P131
P41
P73
P171
P87
P85
P143
P129
P51
38
P145
P191
P33
P71
P163
P177
P193
41
34
P69
P147
P197
P201
P97
P13
P31
P93
P65
P159
P101
P195
24
37
33
P179
P15
P165
P63
P119
P21
40
P29
P103
P17
P79
P111
P109
P117
P59
8
P95
P27
26
P113
P115
P25
P57
32
42
P55
27
28
30
31


J10
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J196
J30
J40
J214
J34
J170
J38
J212
J226
J20
J42
J232
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J54
J154
J208
J222
J58
J132
J206
J24
J220
J80
J74
J18
J144
J158
J204
J190
J114
J156
J218
J112
J138
J192
J84
J234
J134
J46
J202
J194
J88
J200
J130
J230
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J176
J44
J146
J136
J92
J128
J178
J14
J174
J62
J180
J96
J48
J162
J172
J142
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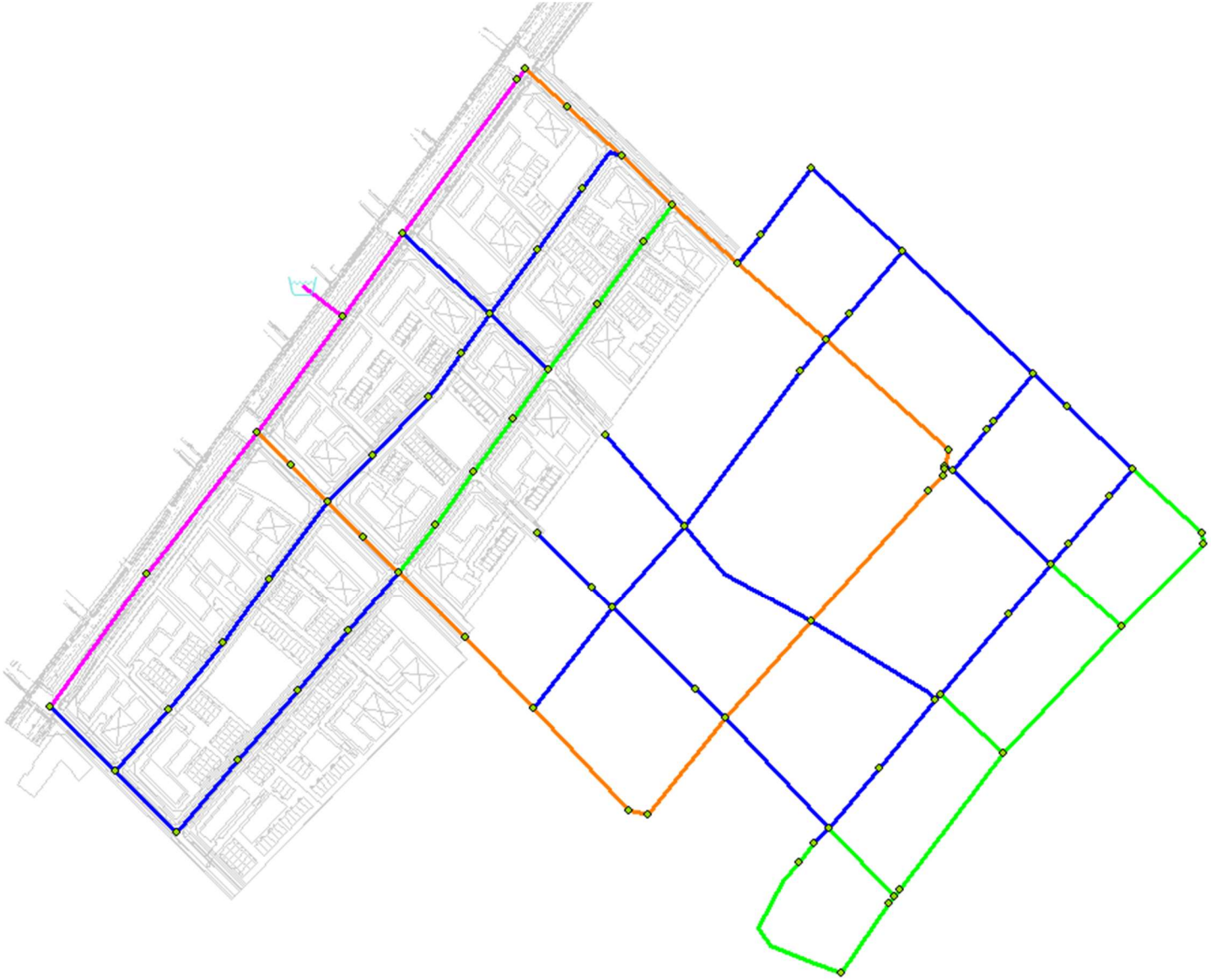
J122
J124



	Color	Size	Break	Label
1		2.00	250.00	less than 250.00
2		2.00	300.00	250.00 ~ 300.00
3		2.00	400.00	300.00 ~ 400.00
4		2.00	600.00	400.00 ~ 600.00

Hydraulic Model Results: Average Day Demand

Project Title: 4938 Rangeview Mississauga
Last Edited: 2022-10-24
Municipality Region of Peel

Junction Pressure (ADD)

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0	84.9	144.07	84.12
J100	9.81	80.1	143.82	90.58
J104	3.76	79.92	143.82	90.84
J110	0	79.47	143.84	91.51
J112	0	81.34	143.83	88.84
J114	0	81.23	143.84	89
J116	0	79.95	143.82	90.8
J118	0	79.36	143.82	91.63
J120	0	78.33	143.82	93.1
J122	0	79.33	143.82	91.68
J124	0	79.44	143.82	91.52
J126	4.67	80.21	143.81	90.42
J128	1.91	81.35	143.82	88.81
J130	0	82.01	143.82	87.87
J132	0	82.11	143.83	87.74
J134	0.74	81.8	143.85	88.21
J136	0	79.85	143.84	90.97
J138	0	82.78	143.82	86.78
J14	0	81.75	143.94	88.41
J142	0	80.35	143.89	90.33
J144	0	83.05	143.85	86.43
J146	0	81.26	143.85	88.98
J150	0	78.92	143.87	92.33
J152	0	75.92	143.86	96.59
J154	0	82.07	143.85	87.83
J156	0	81.32	143.84	88.87
J158	0	81.44	143.84	88.71
J160	0	85.03	144.07	83.94
J162	0	83.72	144.08	85.81
J164	0	81.79	144.03	88.48
J166	0	80.85	144.02	89.8
J170	0	86.05	144.09	82.51
J172	4.27	82.23	144.02	87.85
J174	1.27	82.89	144.02	86.9
J176	3.28	83.56	144.02	85.95
J178	3.84	82.34	143.98	87.63
J18	0	86.12	144.09	82.4
J180	2.6	82	143.99	88.12
J182	3.04	81.32	144	89.1
J190	0	82.36	144.05	87.7
J192	0	81.89	144.02	88.32
J194	0	81.79	144	88.43
J196	2.45	84.23	144.04	85.02
J198	0	81.77	143.98	88.44
J20	10.36	82.84	143.84	86.72
J200	0	81.35	143.82	88.81
J202	0	81.35	143.82	88.81
J204	2.11	84.51	144.01	84.59
J206	1.93	85.01	144.01	83.87
J208	1.62	85.31	144.01	83.45
J210	1.38	85.52	144.01	83.15
J212	2.27	84.83	144	84.11
J214	2.57	84.13	143.99	85.09
J218	0.66	83.55	143.98	85.9
J220	4.27	83.93	143.98	85.36
J222	0	83.84	143.99	85.5
J224	4.05	83.31	143.96	86.22
J226	3.61	82.99	143.95	86.66
J230	0	85.14	144.08	83.79
J232	0	86.44	144.11	81.98
J234	5.05	82.62	143.98	87.23
J24	9.66	82.29	143.82	87.47
J30	2.71	83.73	143.99	85.66
J34	8.9	83.36	143.95	86.14
J38	0	82.86	143.89	86.76
J40	0.69	83.61	143.87	85.66
J42	0	82.93	143.89	86.67
J44	3.24	81.47	143.85	88.68
J46	0	82.71	143.85	86.92
J48	0	80.79	143.82	89.6
J50	0	80.75	143.82	89.66
J54	1.24	82.17	143.85	87.68
J58	3.41	82.05	143.85	87.86
J62	14.25	79.65	143.84	91.25
J64	8.79	81.1	143.84	89.19
J70	0	81.15	143.84	89.12
J74	7.19	81.63	143.83	88.42
J80	0.19	81.7	143.83	88.32
J84	0.7	82.46	143.82	87.23
J88	3.38	82	143.82	87.88
J92	8.34	81.61	143.82	88.44
J96	0	80.91	143.82	89.43

Pipe Data (ADD)

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status
24	J44	J146	37.79	300	120	-3.24	0.05	0	0.01	Open
25	J112	J114	11.08	300	120	-17.92	0.25	0	0.31	Open
26	J110	J116	162.84	300	120	11.89	0.17	0.02	0.14	Open
27	J116	J118	103.23	200	120	0.74	0.02	0	0.01	Open
28	J120	J118	17.79	200	120	0.72	0.02	0	0.01	Open
29	J118	J122	14.95	200	120	1.46	0.05	0	0.02	Open
30	J122	J124	88.59	200	120	1.46	0.05	0	0.02	Open
31	J124	J126	144.09	200	120	1.46	0.05	0	0.02	Open
32	J50	J120	146.51	200	120	0.72	0.02	0	0.01	Open
33	J130	J128	112.4	200	120	1.08	0.03	0	0.01	Open
34	J130	J112	156.59	300	120	-8.84	0.12	0.01	0.08	Open
35	J74	J112	79.98	300	120	-9.08	0.13	0.01	0.09	Open
36	J198	J14	97.33	400	120	44.45	0.35	0.04	0.41	Open
37	J134	J136	166.63	300	120	7.15	0.1	0.01	0.06	Open
38	J138	J24	110.22	300	120	-1.44	0.02	0	0	Open
40	J142	J146	135.17	300	120	17.44	0.25	0.04	0.29	Open
41	J144	J134	154.56	300	120	0	0	0	0	Open
42	J126	J104	40.45	200	120	-3.21	0.1	0	0.09	Open
6	J40	J38	120.78	300	120	-13.02	0.18	0.02	0.17	Open
8	J48	J50	91.46	200	120	0.97	0.03	0	0.01	Open
P101	J176	J174	85.38	300	120	-3.8	0.05	0	0.02	Open
P103	J174	J172	93.42	300	120	-5.07	0.07	0	0.03	Open
P105	J18	J232	155.9	600	120	-74.85	0.26	0.02	0.15	Open
P107	J160	J10	17.35	600	120	52.78	0.19	0	0.08	Open
P109	J172	J164	87.09	300	120	-9.34	0.13	0.01	0.09	Open
P111	J162	J164	99.75	300	120	22.66	0.32	0.05	0.48	Open
P113	J164	J166	93.28	300	120	13.32	0.19	0.02	0.18	Open
P115	J166	J182	103.28	300	120	13.32	0.19	0.02	0.18	Open
P117	J182	J180	97.96	300	120	10.28	0.15	0.01	0.11	Open
P119	J180	J178	85.13	300	120	7.68	0.11	0.01	0.06	Open
P121	J170	J160	222.37	600	120	52.78	0.19	0.02	0.08	Open
P129	J218	J220	71.02	250	110	-2.07	0.04	0	0.02	Open
P13	J146	J134	109.84	300	120	5.01	0.07	0	0.03	Open
P131	J220	J222	64.95	250	110	-6.34	0.13	0.01	0.13	Open
P133	J222	J224	89.72	250	110	9.83	0.2	0.03	0.29	Open
P135	J224	J226	83.02	250	110	5.78	0.12	0.01	0.11	Open
P143	J18	J190	61.03	400	120	52.19	0.42	0.03	0.55	Open
P145	J190	J192	58.87	400	120	52.19	0.42	0.03	0.55	Open
P147	J192	J194	53.81	400	120	44.24	0.35	0.02	0.41	Open
P15	J146	J62	118.8	300	120	9.19	0.13	0.01	0.09	Open
P151	J214	J212	82.47	300	120	-9.56	0.14	0.01	0.1	Open
P153	J212	J210	85.62	300	120	-11.83	0.17	0.01	0.14	Open
P155	J196	J30	100.45	400	120	50.33	0.4	0.05	0.51	Open
P157	J194	J198	45.99	400	120	44.24	0.35	0.02	0.41	Open
P159	J128	J200	133.31	200	120	-0.58	0.02	0	0	Open
P161	J210	J208	52.95	300	120	-2.81	0.04	0	0.01	Open
P163	J202	J138	119.12	200	120	-0.58	0.02	0	0	Open
P165	J136	J96	166.15	300	120	10.41	0.15	0.02	0.11	Open
P167	J200	J202	11.25	200	120	-0.58	0.02	0	0	Open
P169	J208	J206	57.99	300	120	-4.43	0.06	0	0.02	Open
P17	J62	J110	47.94	300	120	-5.06	0.07	0	0.03	Open
P171	J206	J204	88.86	300	120	-6.36	0.09	0	0.05	Open
P175	J210	J222	86.86	300	120	16.17	0.23	0.02	0.26	Open
P177	J18	J230	193.5	600	120	22.66	0.08	0	0.02	Open
P179	J230	J162	178.15	600	120	22.66	0.08	0	0.02	Open
P183	J232	J170	110.92	600	120	79.35	0.28	0.02	0.17	Open
P185	RES9002	J232	1	600	120	154.21	0.55	0	0.57	Open
P187	J214	J30	62.97	300	120	6.99	0.1	0	0.05	Open
P189	J226	J34	51.07	250	110	2.17	0.04	0	0.02	Open
P19	J20	J54	117.59	300	120	-7.42	0.11	0.01	0.06	Open
P191	J204	J192	68.52	300	120	-8.47	0.12	0.01	0.08	Open
P193	J218	J234	71.16	250	110	1.41	0.03	0	0.01	Open
P195	J198	J178	83.36	300	120	-3.84	0.05	0	0.02	Open
P197	J192	J176	106.15	300	120	-0.52	0.01	0	0	Open
P199	J170	J210	128.03	300	120	26.57	0.38	0.08	0.64	Open
P201	J234	J198	64.68	250	110	-3.64	0.07	0	0.05	Open
P21	J14	J142	116.76	400	120	44.45	0.35	0.05	0.41	Open
P25	J150	J152	12.66	400	120	27.01	0.21	0	0.16	Open
P27	J152	J110	132.14	400	120	27.01	0.21	0.02	0.16	Open
P29	J110	J136	128.24	400	120	10.06	0.08	0	0.03	Open
P31	J136	J64	180.81	400	120	6.8	0.05	0	0.01	Open
P33	J64	J70	14.43	400	120	-1.99	0.02	0	0	Open
P35	J70	J156	34.75	400	120	-1.99	0.02	0	0	Open
P37	J156	J114	6.2	400	120	-1.99	0.02	0	0	Open
P39	J114	J158	17.17	400	120	-19.91	0.16	0	0.09	Open
P41	J154	J158	153.05	400	120	19.91	0.16	0.01	0.09	Open
P43	J42	J154	156.43	400	120	34.86	0.28	0.04	0.26	Open
P45	J34	J42	120.68	400	120	47.88	0.38	0.06	0.47	Open
P47	J30	J34	57.66	400	120	54.61	0.43	0.03	0.6	Open
P51	J58	J134	228.31	300	120	2.88	0.04	0	0.01	Open
P53	J154	J58	39.98	300	120	6.29	0.09	0	0.04	Open
P55	J104	J116	41.94	300	120	-6.97	0.1	0	0.05	Open
P57	J116	J100	77.25	300	120	4.18	0.06	0	0.02	Open
P59	J100	J96	84.08	300	120	-5.63	0.08	0	0.04	Open
P61	J96	J48	6.45	300	120	4.78	0.07	0	0.03	Open
P63	J48	J92	120.82	300	120	3.81	0.05	0	0.02	Open
P65	J92	J130	97.59	300	120	-4.53	0.06	0	0.02	Open
P69	J84	J88	69.9	300	120	0.15	0	0	0	Open
P71	J138	J84	53.85	300	120	0.85	0.01	0	0	Open
P73	J132	J24	44.79	300	120	11.1	0.16	0.01	0.13	Open
P75	J20	J132	172.6	300	120	9.39	0.13	0.02	0.09	Open
P77	J40	J20	159.11	300	120	12.33	0.17	0.02	0.15	Open
P79	J50	J128	234.05	200	120	0.25	0.01	0	0	Open
P81	J38	J42	35.3	300	120	-13.02	0.18	0.01	0.17	Open
P83	J54	J154	41.53	300	120	-8.66	0.12	0	0.08	Open
P85	J80	J74	13.52	300	120	-1.89	0.03	0	0	Open
P87	J132	J80	74.26	300	120	-1.7	0.02	0	0	Open
P89	J10	J196	62.59	400	120	52.78	0.42	0.04	0.56	Open
P93	J130	J88	30.88	300	120	-3.23	0.05	0	0.01	Open
P95	J142	J150	156.08	400	120	27.01	0.21	0.03	0.16	Open
P97	J46	J44	100.05	300	120	0	0	0	0	Open

Hydraulic Model Results: Maximum Day Demand

Project Title: 4938 Rangeview Mississauga
Last Edited: 2022-10-24
Municipality Region of Peel

Junction Pressure (MDD)

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0	84.9	143.99	84
J100	19.44	80.1	143.18	89.67
J104	7.53	79.92	143.18	89.93
J110	0	79.47	143.26	90.68
J112	0	81.34	143.24	87.99
J114	0	81.23	143.25	88.16
J116	0	79.95	143.19	89.89
J118	0	79.36	143.18	90.73
J120	0	78.33	143.19	92.2
J122	0	79.33	143.18	90.77
J124	0	79.44	143.18	90.61
J126	9.2	80.21	143.16	89.5
J128	2.67	81.35	143.19	87.92
J130	0	82.01	143.2	86.98
J132	0	82.11	143.22	86.87
J134	1.04	81.8	143.28	87.4
J136	0	79.85	143.25	90.13
J138	0	82.78	143.2	85.89
J14	0	81.75	143.56	87.87
J142	0	80.35	143.41	89.65
J144	0	83.05	143.28	85.62
J146	0	81.26	143.29	88.18
J150	0	78.92	143.33	91.57
J152	0	75.92	143.33	95.82
J154	0	82.07	143.3	87.04
J156	0	81.32	143.25	88.03
J158	0	81.44	143.25	87.87
J160	0	85.03	143.99	83.82
J162	0	83.72	144.01	85.71
J164	0	81.79	143.85	88.23
J166	0	80.85	143.8	89.49
J170	0	86.05	144.05	82.45
J172	8.54	82.23	143.83	87.57
J174	2.54	82.89	143.82	86.62
J176	6.55	83.56	143.81	85.66
J178	7.68	82.34	143.69	87.21
J18	0	86.12	144.03	82.33
J180	5.2	82	143.7	87.72
J182	6.07	81.32	143.74	88.73
J190	0	82.36	143.92	87.51
J192	0	81.89	143.81	88.03
J194	0	81.79	143.74	88.07
J196	4.82	84.23	143.87	84.79
J198	0	81.77	143.68	88.02
J20	14.5	82.84	143.28	85.91
J200	0	81.35	143.2	87.92
J202	0	81.35	143.2	87.92
J204	4.22	84.51	143.8	84.28
J206	3.86	85.01	143.78	83.55
J208	3.23	85.31	143.78	83.12
J210	2.77	85.52	143.78	82.82
J212	4.54	84.83	143.74	83.75
J214	5.14	84.13	143.72	84.71
J218	1.32	83.55	143.67	85.47
J220	8.54	83.93	143.68	84.94
J222	0	83.84	143.71	85.1
J224	8.1	83.31	143.62	85.74
J226	7.21	82.99	143.6	86.16
J230	0	85.14	144.02	83.7
J232	0	86.44	144.11	81.98
J234	10.1	82.62	143.67	86.79
J24	13.52	82.29	143.2	86.59
J30	5.42	83.73	143.71	85.26
J34	17.8	83.36	143.6	85.63
J38	0	82.86	143.41	86.07
J40	0.97	83.61	143.35	84.92
J42	0	82.93	143.42	86
J44	6.48	81.47	143.29	87.88
J46	0	82.71	143.29	86.12
J48	0	80.79	143.19	88.71
J50	0	80.75	143.19	88.77
J54	2.49	82.17	143.29	86.89
J58	6.82	82.05	143.29	87.06
J62	28.29	79.65	143.25	90.42
J64	17.58	81.1	143.25	88.35
J70	0	81.15	143.25	88.27
J74	14.39	81.63	143.22	87.55
J80	0.27	81.7	143.22	87.45
J84	0.98	82.46	143.2	86.35
J88	6.59	82	143.2	87
J92	16.37	81.61	143.19	87.54
J96	0	80.91	143.19	88.54

Pipe Data (MDD)

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status
24	J44	J146	37.79	300	120	-6.48	0.09	0	0.05	Open
25	J112	J114	11.08	300	120	-31.07	0.44	0.01	0.86	Open
26	J110	J116	162.84	300	120	22.16	0.31	0.07	0.46	Open
27	J116	J118	103.23	200	120	0.9	0.03	0	0.01	Open
28	J120	J118	17.79	200	120	2.08	0.07	0	0.04	Open
29	J118	J122	14.95	200	120	2.97	0.09	0	0.08	Open
30	J122	J124	88.59	200	120	2.97	0.09	0.01	0.08	Open
31	J124	J126	144.09	200	120	2.97	0.09	0.01	0.08	Open
32	J50	J120	146.51	200	120	2.08	0.07	0.01	0.04	Open
33	J130	J128	112.4	200	120	2.09	0.07	0	0.04	Open
34	J130	J112	156.59	300	120	-15.91	0.23	0.04	0.25	Open
35	J74	J112	79.98	300	120	-15.16	0.21	0.02	0.23	Open
36	J198	J14	97.33	400	120	81.98	0.65	0.12	1.27	Open
37	J134	J136	166.63	300	120	13.34	0.19	0.03	0.18	Open
38	J138	J24	110.22	300	120	-5.5	0.08	0	0.03	Open
40	J142	J146	135.17	300	120	32.13	0.45	0.12	0.91	Open
41	J144	J134	154.56	300	120	0	0	0	0	Open
42	J126	J104	40.45	200	120	-6.23	0.2	0.01	0.31	Open
6	J40	J38	120.78	300	120	-23	0.33	0.06	0.49	Open
8	J48	J50	91.46	200	120	1.14	0.04	0	0.01	Open
P101	J176	J174	85.38	300	120	-6.8	0.1	0	0.05	Open
P103	J174	J172	93.42	300	120	-9.34	0.13	0.01	0.09	Open
P105	J18	J232	155.9	600	120	-142.45	0.5	0.08	0.49	Open
P107	J160	J10	17.35	600	120	99.78	0.35	0	0.25	Open
P109	J172	J164	87.09	300	120	-17.88	0.25	0.03	0.31	Open
P111	J162	J164	99.75	300	120	43.21	0.61	0.16	1.58	Open
P113	J164	J166	93.28	300	120	25.33	0.36	0.05	0.59	Open
P115	J166	J182	103.28	300	120	25.33	0.36	0.06	0.59	Open
P117	J182	J180	97.96	300	120	19.26	0.27	0.03	0.35	Open
P119	J180	J178	85.13	300	120	14.06	0.2	0.02	0.2	Open
P121	J170	J160	222.37	600	120	99.78	0.35	0.06	0.25	Open
P129	J218	J220	71.02	250	110	-3.76	0.08	0	0.05	Open
P13	J146	J134	109.84	300	120	8.21	0.12	0.01	0.07	Open
P131	J220	J222	64.95	250	110	-12.3	0.25	0.03	0.44	Open
P133	J222	J224	89.72	250	110	18.34	0.37	0.08	0.92	Open
P135	J224	J226	83.02	250	110	10.24	0.21	0.03	0.31	Open
P143	J18	J190	61.03	400	120	99.24	0.79	0.11	1.81	Open
P145	J190	J192	58.87	400	120	99.24	0.79	0.11	1.81	Open
P147	J192	J194	53.81	400	120	83.26	0.66	0.07	1.31	Open
P15	J146	J62	118.8	300	120	17.45	0.25	0.03	0.29	Open
P151	J214	J212	82.47	300	120	-17.52	0.25	0.02	0.3	Open
P153	J212	J210	85.62	300	120	-22.06	0.31	0.04	0.45	Open
P155	J196	J30	100.45	400	120	94.96	0.76	0.17	1.67	Open
P157	J194	J198	45.99	400	120	83.26	0.66	0.06	1.31	Open
P159	J128	J200	133.31	200	120	-1.51	0.05	0	0.02	Open
P161	J210	J208	52.95	300	120	-4.92	0.07	0	0.03	Open
P163	J202	J138	119.12	200	120	-1.51	0.05	0	0.02	Open
P165	J136	J96	166.15	300	120	19.21	0.27	0.06	0.35	Open
P167	J200	J202	11.25	200	120	-1.51	0.05	0	0.02	Open
P169	J208	J206	57.99	300	120	-8.15	0.12	0	0.07	Open
P17	J62	J110	47.94	300	120	-10.84	0.15	0.01	0.12	Open
P171	J206	J204	88.86	300	120	-12.01	0.17	0.01	0.15	Open
P175	J210	J222	86.86	300	120	30.64	0.43	0.07	0.83	Open
P177	J18	J230	193.5	600	120	43.21	0.15	0.01	0.05	Open
P179	J230	J162	178.15	600	120	43.21	0.15	0.01	0.05	Open
P183	J232	J170	110.92	600	120	150.32	0.53	0.06	0.54	Open
P185	RES9002	J232	1	600	120	292.78	1.04	0	1.87	Open
P187	J214	J30	62.97	300	120	12.38	0.18	0.01	0.16	Open
P189	J226	J34	51.07	250	110	3.03	0.06	0	0.03	Open
P19	J20	J54	117.59	300	120	-10.99	0.16	0.01	0.12	Open
P191	J204	J192	68.52	300	120	-16.23	0.23	0.02	0.26	Open
P193	J218	J234	71.16	250	110	2.44	0.05	0	0.02	Open
P195	J198	J178	83.36	300	120	-6.38	0.09	0	0.05	Open
P197	J192	J176	106.15	300	120	-0.25	0	0	0	Open
P199	J170	J210	128.03	300	120	50.55	0.72	0.27	2.11	Open
P201	J234	J198	64.68	250	110	-7.66	0.16	0.01	0.18	Open
P21	J14	J142	116.76	400	120	81.98	0.65	0.15	1.27	Open
P25	J150	J152	12.66	400	120	49.85	0.4	0.01	0.51	Open
P27	J152	J110	132.14	400	120	49.85	0.4	0.07	0.51	Open
P29	J110	J136	128.24	400	120	16.84	0.13	0.01	0.07	Open
P31	J136	J64	180.81	400	120	10.97	0.09	0.01	0.03	Open
P33	J64	J70	14.43	400	120	-6.61	0.05	0	0.01	Open
P35	J70	J156	34.75	400	120	-6.61	0.05	0	0.01	Open
P37	J156	J114	6.2	400	120	-6.61	0.05	0	0.01	Open
P39	J114	J158	17.17	400	120	-37.68	0.3	0.01	0.3	Open
P41	J154	J158	153.05	400	120	37.68	0.3	0.05	0.3	Open
P43	J42	J154	156.43	400	120	64.15	0.51	0.13	0.81	Open
P45	J34	J42	120.68	400	120	87.15	0.69	0.17	1.42	Open
P47	J30	J34	57.66	400	120	101.92	0.81	0.11	1.9	Open
P51	J58	J134	228.31	300	120	6.17	0.09	0.01	0.04	Open
P53	J154	J58	39.98	300	120	12.99	0.18	0.01	0.17	Open
P55	J104	J116	41.94	300	120	-13.76	0.19	0.01	0.19	Open
P57	J116	J100	77.25	300	120	7.51	0.11	0	0.06	Open
P59	J100	J96	84.08	300	120	-11.93	0.17	0.01	0.15	Open
P61	J96	J48	6.45	300	120	7.27	0.1	0	0.06	Open
P63	J48	J92	120.82	300	120	6.13	0.09	0.01	0.04	Open
P65	J92	J130	97.59	300	120	-10.24	0.14	0.01	0.11	Open
P69	J84	J88	69.9	300	120	3.01	0.04	0	0.01	Open
P71	J138	J84	53.85	300	120	3.99	0.06	0	0.02	Open
P73	J132	J24	44.79	300	120	19.02	0.27	0.02	0.34	Open
P75	J20	J132	172.6	300	120	18.52	0.26	0.06	0.33	Open
P77	J40	J20	159.11	300	120	22.03	0.31	0.07	0.45	Open
P79	J50	J128	234.05	200	120	-0.93	0.03	0	0.01	Open
P81	J38	J42	35.3	300	120	-23	0.33	0.02	0.49	Open
P83	J54	J154	41.53	300	120	-13.48	0.19	0.01	0.18	Open
P85	J80	J74	13.52	300	120	-0.77	0.01	0	0	Open
P87	J132	J80	74.26	300	120	-0.5	0.01	0	0	Open
P89	J10	J196	62.59	400	120	99.78	0.79	0.11	1.83	Open
P93	J88	J130	30.88	300	120	-3.58	0.05	0	0.02	Open
P95	J142	J150	156.08	400	120	49.85	0.4	0.08	0.51	Open
P97	J46	J44	100.05	300	120	0	0	0	0	Open

Hydraulic Model Results: Peak Hour Demand

Project Title: 4938 Rangeview Mississauga
Last Edited: 2022-10-24
Municipality Region of Peel

Junction Pressure (PHD)

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0	84.9	143.82	83.76
J100	29.42	80.1	141.88	87.82
J104	11.29	79.92	141.87	88.07
J110	0	79.47	142.07	88.99
J112	0	81.34	142	86.24
J114	0	81.23	142.03	86.43
J116	0	79.95	141.89	88.05
J118	0	79.36	141.89	88.89
J120	0	78.33	141.89	90.35
J122	0	79.33	141.88	88.92
J124	0	79.44	141.87	88.75
J126	14.01	80.21	141.84	87.62
J128	5.73	81.35	141.89	86.06
J130	0	82.01	141.9	85.14
J132	0	82.11	141.94	85.06
J134	2.23	81.8	142.12	85.74
J136	0	79.85	142.04	88.41
J138	0	82.78	141.9	84.04
J14	0	81.75	142.81	86.8
J142	0	80.35	142.44	88.27
J144	0	83.05	142.12	83.97
J146	0	81.26	142.14	86.55
J150	0	78.92	142.25	90.03
J152	0	75.92	142.23	94.27
J154	0	82.07	142.15	85.41
J156	0	81.32	142.03	86.3
J158	0	81.44	142.04	86.15
J160	0	85.03	143.83	83.59
J162	0	83.72	143.88	85.53
J164	0	81.79	143.52	87.75
J166	0	80.85	143.39	88.91
J170	0	86.05	143.96	82.33
J172	12.8	82.23	143.46	87.04
J174	3.81	82.89	143.43	86.07
J176	9.83	83.56	143.42	85.1
J178	11.52	82.34	143.13	86.41
J18	0	86.12	143.93	82.18
J180	7.81	82	143.17	86.95
J182	9.11	81.32	143.25	88.04
J190	0	82.36	143.67	87.16
J192	0	81.89	143.42	87.47
J194	0	81.79	143.26	87.38
J196	7.36	84.23	143.55	84.33
J198	0	81.77	143.11	87.21
J20	31.08	82.84	142.07	84.2
J200	0	81.35	141.89	86.07
J202	0	81.35	141.9	86.07
J204	6.33	84.51	143.38	83.69
J206	5.79	85.01	143.35	82.94
J208	4.85	85.31	143.34	82.5
J210	4.15	85.52	143.34	82.19
J212	6.81	84.83	143.24	83.04
J214	7.71	84.13	143.18	83.95
J218	1.97	83.55	143.1	84.65
J220	12.81	83.93	143.1	84.12
J222	0	83.84	143.17	84.34
J224	12.14	83.31	142.97	84.81
J226	10.82	82.99	142.9	85.17
J230	0	85.14	143.9	83.54
J232	0	86.44	144.11	81.98
J234	15.15	82.62	143.09	85.97
J24	28.97	82.29	141.9	84.74
J30	8.13	83.73	143.16	84.48
J34	26.71	83.36	142.89	84.63
J38	0	82.86	142.41	84.66
J40	2.08	83.61	142.26	83.37
J42	0	82.93	142.46	84.63
J44	9.72	81.47	142.14	86.24
J46	0	82.71	142.14	84.48
J48	0	80.79	141.9	86.87
J50	0	80.75	141.89	86.92
J54	3.73	82.17	142.12	85.23
J58	10.23	82.05	142.13	85.41
J62	42.75	79.65	142.06	88.72
J64	26.37	81.1	142.03	86.61
J70	0	81.15	142.03	86.54
J74	21.58	81.63	141.95	85.75
J80	0.57	81.7	141.95	85.65
J84	2.11	82.46	141.9	84.5
J88	10.14	82	141.9	85.15
J92	25.01	81.61	141.88	85.68
J96	0	80.91	141.9	86.7

Pipe Data (PHD)

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status
24	J44	J146	37.79	300	120	-9.72	0.14	0	0.1	Open
25	J112	J114	11.08	300	120	-53.76	0.76	0.03	2.36	Open
26	J110	J116	162.84	300	120	35.67	0.5	0.18	1.1	Open
27	J116	J118	103.23	200	120	2.23	0.07	0	0.05	Open
28	J120	J118	17.79	200	120	2.17	0.07	0	0.04	Open
29	J118	J122	14.95	200	120	4.4	0.14	0	0.16	Open
30	J122	J124	88.59	200	120	4.4	0.14	0.01	0.16	Open
31	J124	J126	144.09	200	120	4.4	0.14	0.02	0.16	Open
32	J50	J120	146.51	200	120	2.17	0.07	0.01	0.04	Open
33	J130	J128	112.4	200	120	3.22	0.1	0.01	0.09	Open
34	J130	J112	156.59	300	120	-26.5	0.37	0.1	0.64	Open
35	J74	J112	79.98	300	120	-27.26	0.39	0.05	0.67	Open
36	J198	J14	97.33	400	120	133.36	1.06	0.3	3.13	Open
37	J134	J136	166.63	300	120	21.43	0.3	0.07	0.43	Open
38	J138	J24	110.22	300	120	-4.31	0.06	0	0.02	Open
40	J142	J146	135.17	300	120	52.32	0.74	0.3	2.25	Open
41	J144	J134	154.56	300	120	0	0	0	0	Open
42	J126	J104	40.45	200	120	-9.61	0.31	0.03	0.7	Open
6	J40	J38	120.78	300	120	-39.06	0.55	0.16	1.31	Open
8	J48	J50	91.46	200	120	2.93	0.09	0.01	0.08	Open
P101	J176	J174	85.38	300	120	-11.41	0.16	0.01	0.13	Open
P103	J174	J172	93.42	300	120	-15.22	0.22	0.02	0.23	Open
P105	J18	J232	155.9	600	120	-224.55	0.79	0.18	1.14	Open
P107	J160	J10	17.35	600	120	158.35	0.56	0.01	0.6	Open
P109	J172	J164	87.09	300	120	-28.02	0.4	0.06	0.71	Open
P111	J162	J164	99.75	300	120	67.99	0.96	0.36	3.65	Open
P113	J164	J166	93.28	300	120	39.97	0.57	0.13	1.36	Open
P115	J166	J182	103.28	300	120	39.97	0.57	0.14	1.36	Open
P117	J182	J180	97.96	300	120	30.86	0.44	0.08	0.84	Open
P119	J180	J178	85.13	300	120	23.05	0.33	0.04	0.49	Open
P121	J170	J160	222.37	600	120	158.35	0.56	0.13	0.6	Open
P129	J218	J220	71.02	250	110	-6.21	0.13	0.01	0.12	Open
P13	J146	J134	109.84	300	120	15.03	0.21	0.02	0.22	Open
P131	J220	J222	64.95	250	110	-19.02	0.39	0.06	0.98	Open
P133	J222	J224	89.72	250	110	29.5	0.6	0.2	2.22	Open
P135	J224	J226	83.02	250	110	17.36	0.35	0.07	0.83	Open
P143	J18	J190	61.03	400	120	156.56	1.25	0.26	4.21	Open
P145	J190	J192	58.87	400	120	156.56	1.25	0.25	4.21	Open
P147	J192	J194	53.81	400	120	132.73	1.06	0.17	3.1	Open
P15	J146	J62	118.8	300	120	27.57	0.39	0.08	0.69	Open
P151	J214	J212	82.47	300	120	-28.68	0.41	0.06	0.74	Open
P153	J212	J210	85.62	300	120	-35.49	0.5	0.09	1.09	Open
P155	J196	J30	100.45	400	120	150.99	1.2	0.4	3.94	Open
P157	J194	J198	45.99	400	120	132.73	1.06	0.14	3.1	Open
P159	J128	J200	133.31	200	120	-1.75	0.06	0	0.03	Open
P161	J210	J208	52.95	300	120	-8.44	0.12	0	0.08	Open
P163	J202	J138	119.12	200	120	-1.75	0.06	0	0.03	Open
P165	J136	J96	166.15	300	120	31.22	0.44	0.14	0.86	Open
P167	J200	J202	11.25	200	120	-1.75	0.06	0	0.03	Open
P169	J208	J206	57.99	300	120	-13.29	0.19	0.01	0.18	Open
P17	J62	J110	47.94	300	120	-15.18	0.21	0.01	0.23	Open
P171	J206	J204	88.86	300	120	-19.08	0.27	0.03	0.35	Open
P175	J210	J222	86.86	300	120	48.52	0.69	0.17	1.95	Open
P177	J18	J230	193.5	600	120	67.99	0.24	0.02	0.12	Open
P179	J230	J162	178.15	600	120	67.99	0.24	0.02	0.12	Open
P183	J232	J170	110.92	600	120	238.07	0.84	0.14	1.27	Open
P185	RES9002	J232	1	600	120	462.63	1.64	0	4.35	Open
P187	J214	J30	62.97	300	120	20.97	0.3	0.03	0.41	Open
P189	J226	J34	51.07	250	110	6.54	0.13	0.01	0.14	Open
P19	J20	J54	117.59	300	120	-22.27	0.32	0.05	0.46	Open
P191	J204	J192	68.52	300	120	-25.41	0.36	0.04	0.59	Open
P193	J218	J234	71.16	250	110	4.24	0.09	0	0.06	Open
P195	J198	J178	83.36	300	120	-11.53	0.16	0.01	0.14	Open
P197	J192	J176	106.15	300	120	-1.58	0.02	0	0	Open
P199	J170	J210	128.03	300	120	79.72	1.13	0.63	4.9	Open
P201	J234	J198	64.68	250	110	-10.91	0.22	0.02	0.35	Open
P21	J14	J142	116.76	400	120	133.36	1.06	0.37	3.13	Open
P25	J150	J152	12.66	400	120	81.03	0.64	0.02	1.24	Open
P27	J152	J110	132.14	400	120	81.03	0.64	0.16	1.24	Open
P29	J110	J136	128.24	400	120	30.18	0.24	0.03	0.2	Open
P31	J136	J64	180.81	400	120	20.39	0.16	0.02	0.1	Open
P33	J64	J70	14.43	400	120	-5.98	0.05	0	0.01	Open
P35	J70	J156	34.75	400	120	-5.98	0.05	0	0.01	Open
P37	J156	J114	6.2	400	120	-5.98	0.05	0	0.01	Open
P39	J114	J158	17.17	400	120	-59.74	0.48	0.01	0.71	Open
P41	J154	J158	153.05	400	120	59.74	0.48	0.11	0.71	Open
P43	J42	J154	156.43	400	120	104.6	0.83	0.31	1.99	Open
P45	J34	J42	120.68	400	120	143.66	1.14	0.43	3.59	Open
P47	J30	J34	57.66	400	120	163.83	1.3	0.26	4.58	Open
P51	J58	J134	228.31	300	120	8.63	0.12	0.02	0.08	Open
P53	J154	J58	39.98	300	120	18.86	0.27	0.01	0.34	Open
P55	J104	J116	41.94	300	120	-20.9	0.3	0.02	0.41	Open
P57	J116	J100	77.25	300	120	12.54	0.18	0.01	0.16	Open
P59	J100	J96	84.08	300	120	-16.88	0.24	0.02	0.28	Open
P61	J96	J48	6.45	300	120	14.35	0.2	0	0.2	Open
P63	J48	J92	120.82	300	120	11.42	0.16	0.02	0.13	Open
P65	J92	J130	97.59	300	120	-13.59	0.19	0.02	0.18	Open
P69	J84	J88	69.9	300	120	0.45	0.01	0	0	Open
P71	J138	J84	53.85	300	120	2.56	0.04	0	0.01	Open
P73	J132	J24	44.79	300	120	33.28	0.47	0.04	0.97	Open
P75	J20	J132	172.6	300	120	28.17	0.4	0.12	0.71	Open
P77	J40	J20	159.11	300	120	36.98	0.52	0.19	1.18	Open
P79	J50	J128	234.05	200	120	0.76	0.02	0	0.01	Open
P81	J38	J42	35.3	300	120	-39.06	0.55	0.05	1.31	Open
P83	J54	J154	41.53	300	120	-26	0.37	0.03	0.62	Open
P85	J80	J74	13.52	300	120	-5.68	0.08	0	0.04	Open
P87	J132	J80	74.26	300	120	-5.11	0.07	0	0.03	Open
P89	J10	J196	62.59	400	120	158.35	1.26	0.27	4.3	Open
P93	J88	J130	30.88	300	120	-9.69	0.14	0	0.1	Open
P95	J142	J150	156.08	400	120	81.03	0.64	0.19	1.24	Open
P97	J46	J44	100.05	300	120	0	0	0	0	Open

Hydraulic Model Results - MDD + Fire Flow

Project Title: 4938 Rangeview Mississauga
Last Edited: 2022-10-24
Municipality Region of Peel

Fire Flow Data (MDD_FF)

ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (psi)	Hydrant Available Flow (L/s)	Hydrant Pressure at Available Flow (psi)	Junctions with Pressure Violation
J10	0	84	143.99	317	82.66	3,573.26	20.01	0
J100	19.44	89.67	143.18	300	79.77	1,019.67	20	0
J104	7.53	89.93	143.18	300	77.45	858.37	20	0
J110	0	90.68	143.26	300	85.02	1,514.51	20	0
J112	0	87.99	143.24	300	81.74	1,377.63	20	0
J114	0	88.16	143.25	300	82.29	1,450.07	20	0
J116	0	89.89	143.19	300	80.36	1,027.02	20	0
J118	0	90.73	143.18	300	69.32	597.45	20	0
J120	0	92.2	143.19	300	68.17	563.24	20	0
J122	0	90.77	143.18	300	65.93	546.31	20	0
J124	0	90.61	143.18	300	55.31	444.25	20	0
J126	9.2	89.5	143.16	300	64.5	552.71	20	0
J128	2.67	87.92	143.19	300	66.08	579.13	20	0
J130	0	86.98	143.2	300	78.82	1,115.61	20	0
J132	0	86.87	143.22	300	78.91	1,125.28	20	0
J134	1.04	87.4	143.28	300	80.56	1,238.46	20	0
J136	0	90.13	143.25	300	84.36	1,490.95	20	0
J138	0	85.89	143.2	300	76.17	963.62	20	0
J14	0	87.87	143.56	300	83.98	1,855.57	20	0
J142	0	89.65	143.41	300	84.83	1,652.41	20	0
J144	0	85.62	143.28	300	66.26	601.55	20	0
J146	0	88.18	143.29	300	81.73	1,303.31	20	0
J150	0	91.57	143.33	300	85.88	1,474.94	20	0
J152	0	95.82	143.33	300	90.12	1,522.91	20	0
J154	0	87.04	143.3	300	81.8	1,547.18	20	0
J156	0	88.03	143.25	300	82.12	1,440.18	20	0
J158	0	87.87	143.25	300	81.99	1,440.57	20	0
J160	0	83.82	143.99	317	82.53	3,641.23	20.01	0
J162	0	85.71	144.01	317	84.15	2,811.48	20	0
J164	0	88.23	143.85	317	84.22	1,613.00	20	0
J166	0	89.49	143.8	317	82.56	1,173.32	20	0
J170	0	82.45	144.05	317	81.91	6,046.94	20.02	0
J172	8.54	87.57	143.83	317	81.23	1,229.52	20	0
J174	2.54	86.62	143.82	317	79.73	1,156.27	20	0
J176	6.55	85.66	143.81	317	79.67	1,262.29	20	0
J178	7.68	87.21	143.69	317	80.86	1,267.66	20	0
J18	0	82.33	144.03	317	81.63	5,193.72	20.01	0
J180	5.2	87.72	143.7	317	79.78	1,092.06	20	0
J182	6.07	88.73	143.74	317	80.48	1,067.16	20	0
J190	0	87.51	143.92	317	85.94	3,286.78	20.01	0
J192	0	88.03	143.81	317	86.1	3,017.45	20	0
J194	0	88.07	143.74	317	85.5	2,538.58	20	0
J196	4.82	84.79	143.87	317	82.61	2,691.96	20	0
J198	0	88.02	143.68	317	85.09	2,376.27	20	0
J20	14.5	85.91	143.28	300	78.59	1,180.75	20	0
J200	0	87.92	143.2	300	55.83	458.06	20	0
J202	0	87.92	143.2	300	56.32	462.22	20	0
J204	4.22	84.28	143.8	317	79.91	1,508.35	20	0
J206	3.86	83.55	143.78	317	78.52	1,359.55	20	0
J208	3.23	83.12	143.78	317	78.8	1,490.63	20	0
J210	2.77	82.82	143.78	317	80.13	2,077.07	20	0
J212	4.54	83.75	143.74	317	78.84	1,421.63	20	0
J214	5.14	84.71	143.72	317	80.06	1,509.81	20	0
J218	1.32	85.47	143.67	317	72.71	803.81	20	0
J220	8.54	84.94	143.68	317	73.71	870.36	20	0
J222	0	85.1	143.71	317	79.82	1,366.84	20	0
J224	8.1	85.74	143.62	317	74.59	882.14	20	0
J226	7.21	86.16	143.6	317	77.03	1,006.89	20	0
J230	0	83.7	144.02	317	82.5	3,344.08	20.01	0
J232	0	81.98	144.11	317	81.97	65,316.46	22.31	0
J234	10.1	86.79	143.67	317	76.34	932.46	20	0
J24	13.52	86.59	143.2	300	77.47	1,030.81	20	0
J30	5.42	85.26	143.71	317	82.39	2,366.11	20	0
J34	17.8	85.63	143.6	317	82.14	2,115.77	20	0
J38	0	86.07	143.41	300	79.8	1,280.50	20	0
J40	0.97	84.92	143.35	300	76.28	1,003.13	20	0
J42	0	86	143.42	300	81.48	1,686.74	20	0
J44	6.48	87.88	143.29	300	78.24	971.03	20	0
J46	0	86.12	143.29	300	68.37	637.93	20	0
J48	0	88.71	143.19	300	80.5	1,132.70	20	0
J50	0	88.77	143.19	300	69.14	618.63	20	0
J54	2.49	86.89	143.29	300	80.1	1,244.77	20	0
J58	6.82	87.06	143.29	300	80.14	1,233.05	20	0
J62	28.29	90.42	143.25	300	83.17	1,269.80	20	0
J64	17.58	88.35	143.25	300	82.2	1,416.58	20	0
J70	0	88.27	143.25	300	82.19	1,408.03	20	0
J74	14.39	87.55	143.22	300	79.15	1,103.47	20	0
J80	0.27	87.45	143.22	300	78.98	1,080.03	20	0
J84	0.98	86.35	143.2	300	76.46	957.72	20	0
J88	6.59	87	143.2	300	77.92	1,035.25	20	0
J92	16.37	87.54	143.19	300	77.72	999.60	20	0
J96	0	88.54	143.19	300	80.44	1,142.80	20	0

Appendix B-6

Water Age Analysis

Water Turnover Calculations

Project Title: 4938 - Rangeview Mississauga
Last Edited: 2022-10-24

Municipality Region of Peel

Average Consumption:	0.28	L/cap/day	(Residential Land Use)
	0.3	L/cap/day	(Employment Land Use)
Minimum Consumption:	0.196	L/cap/day[1]	

Turnover Rate Calculation								
Service	**Length**	**Diameter**	**Area**	**Volume**	**Average Consumption (100% Population)**	**Minimum Consumption (70% Population)**	**Minimum Consumption (20% Population)**	**Days for Turnover**
	(m)	**(mm)**	**(m^2)**	**(m^3)**	**(m^3/day)**	**(m^3/day)**	**(m^3/day)**	**(Day)**
Complete System	1257	200	0.03	39.50	13323.80	9326.66	1865.33	0.47
	496	250	0.05	24.33				
	4837	300	0.07	341.92				
	1767	400	0.13	222.06				
	879	600	0.28	248.59				

1 - Minimum consumption calculated using: average day consumption * 0.7

Appendix C
Sanitary Servicing Support Information

Sanitary Flow Calculation

Rangeview Estates Master Functional Servicing Plan (Ulimate

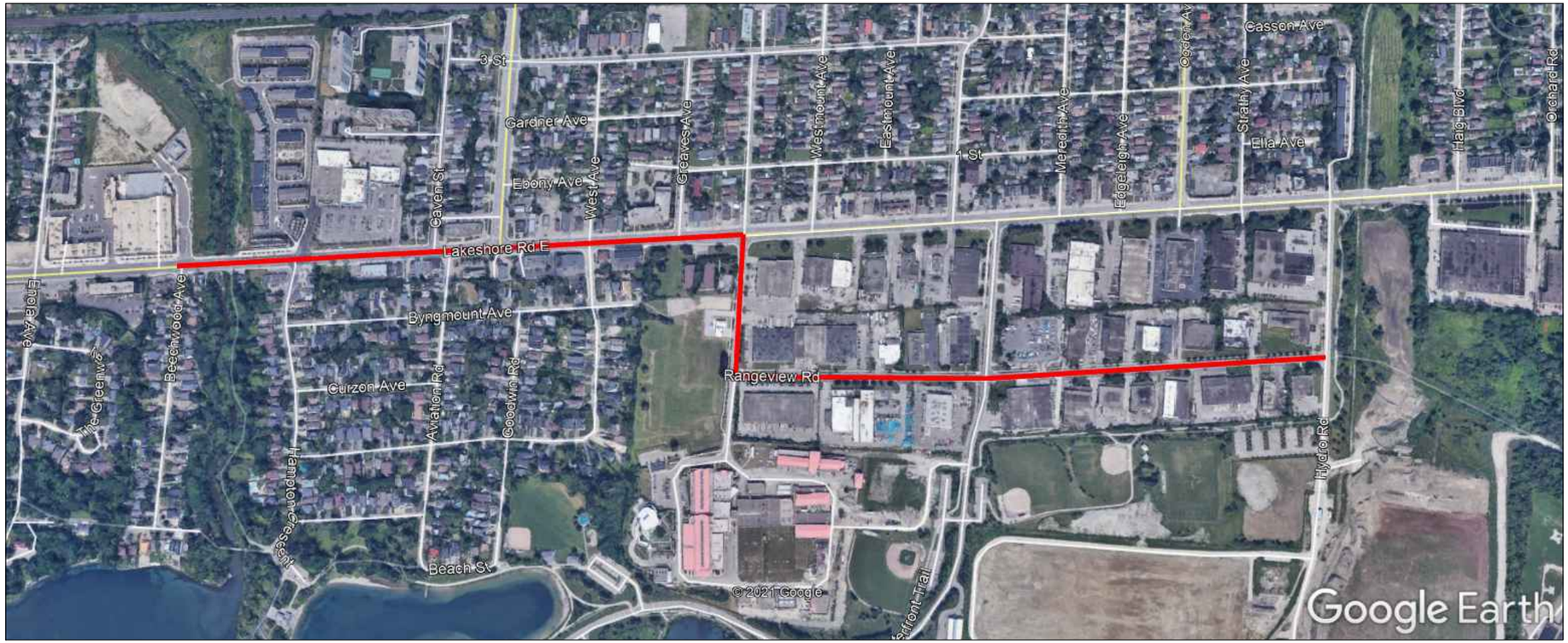
Project No: 4938

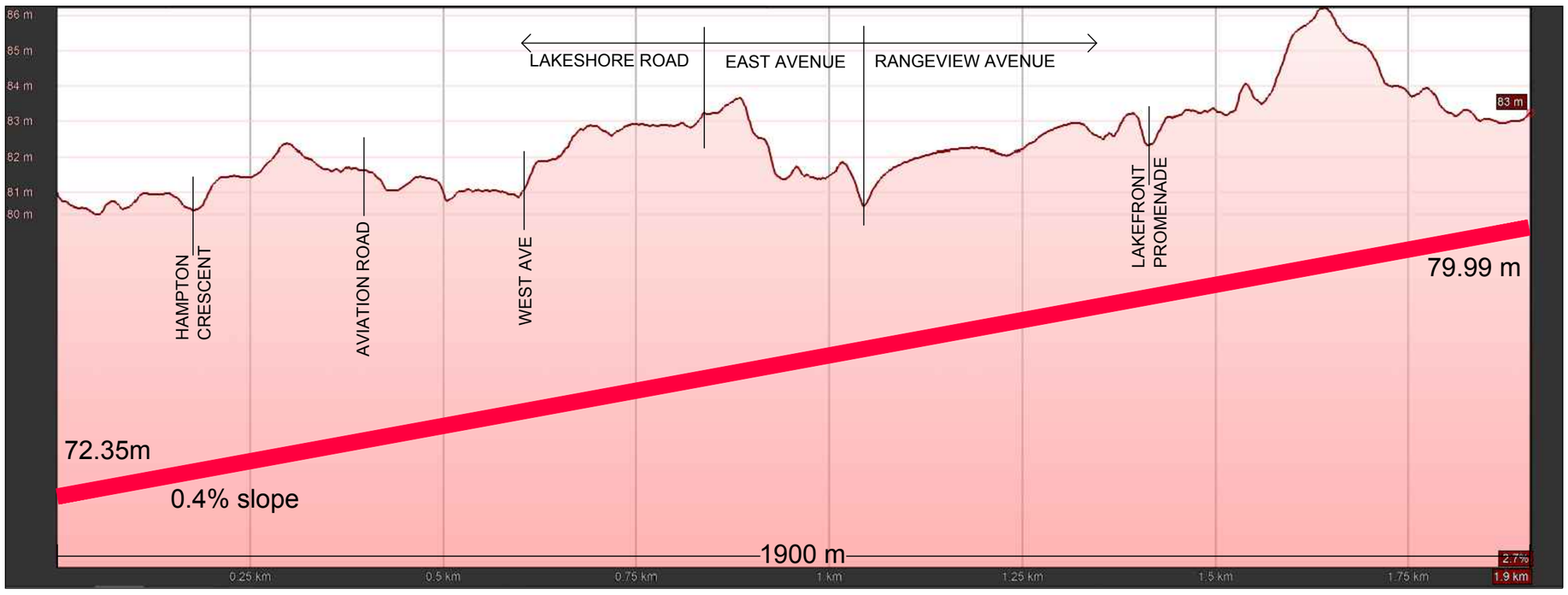
Infiltration Rate:		0.2	L/s/ha
Generation Rate:	Residential and Employment Areas	302.8	L/capita/day

Estimated Site Discharge

Site Discharge	Population****	Average Demand (L/S)	Harmon's Peaking Factor	Flow (L/s) **	Infiltration (L/s)***	Total PeakFlow (L/s)
Townhouse	2007	7.03	3.58	25.21	4.39	**25.21**
Apartment	12775	44.77	2.85	127.53		**127.53**
Commercial	494	1.73	3.98	6.89		**6.89**
					Total Flow =	**164.01**

*As per Region of Peel Guidelines
**Sanitary flow as per Region of Peel Guidelines Drawing 2-9-2
*** Infiltration for the total site =21.94 (full Site)
****Refer to Population Statisitics





RANGEVIEW
MIXED USE DEVELOPMENT

LEGEND

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CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
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www.schaeffers.com

ATTACHMENT C-1
POTENTIAL TRUNK SEWER ALIGNMENT
AND PROFILE SCHEMATIC

2020-4938	OCTOBER 2022	SCALE: N.T.S

Pavel Recnik

W:\4900's\4938 - Rangeview, Mississauga\Drawings\trunk sewer alignment\2021-06-22-Trunk sewer.dwg

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SANITARY SEWER DESIGN SHEET

CITY OF MISSISSAUGA

Rangeview Road Development
Pre-Development Condition

Designed By: P.W.
Checked By: K.Sh
Date: 2-Aug-23
Project No.: 4938

STREET	SECTION		RESIDENTIAL						OTHER											Sewer Design				
	From MH	To MH	Sect Area (ha)	Apart. (ha)	ROW (ha)	SF >10m front. (ha)	SF <10m front. (ha)	Semi Detac. (ha)	Ind. (@ 70 ppha) (ha)	Comm. (@ 50 ppha) (ha)	Inst.	Pop	Acc Pop	Avg Day (L/s)	Peaking Factor	Peak Day (L/s)	ACC AREA (ha)	Infiltration (L/s)	TOTAL Peak Flow (L/s)	Pipe Dia Act. (mm)	Grade (%)	Length (m)	Capacity (L/s)	Remarks
Design Criteria																								
Residential																								
Rowhouses / Other Multiples	*3.5*	*persons/unit*																						
Apartments	*2.7*	*persons/unit*																						
SF (> 10m frontage)	*50*	*persons/ha*																						
SF(< 10m frontage)	*70*	*persons/ha*																						
Semi-Detached	*70*	*persons/ha*																						
ROW Dwellings	*175*	*persons/ha*																						
Apartments	*475*	*persons/ha*																						
ICI																								
Industrial	*70*	*persons/ha*																						
Commercial	*50*	*persons/ha*																						
Infiltration	*0.20*	*L/s/ha*																						
Average Domestic Flow	*302.80*	*L/c/d*																						
Rangeview Rd Downstream System																								
Rangeview Rd	40	39	1.49						0.68	0.61		78	78	0.27	4.27	1.17	1.49	0.30	1.47	250	0.28	93.6	31.29	5%
Rangeview Rd	39	38	2.26						2.03			142	220	0.77	4.13	3.19	3.75	0.75	3.94	250	0.33	91.1	34.22	12%
Rangeview Rd	38	37	1.79						1.23	0.36		105	325	1.14	4.06	4.63	5.54	1.11	5.74	250	0.31	91.3	32.95	17%
Rangeview Rd	37	36	0.85						0.72			51	376	1.32	4.03	5.32	6.40	1.28	6.60	250	0.24	91.9	29.26	23%
Rangeview Rd	36	35	1.63						1.45			102	478	1.68	3.98	6.67	8.03	1.61	8.28	250	0.37	91.0	36.26	23%
Rangeview Rd	35	34	2.17						1.43			100	578	2.03	3.94	7.98	10.20	2.04	10.02	250	0.44	90.2	39.41	25%
Rangeview Rd	34	33	1.72						1.53			107	685	2.40	3.90	9.36	11.92	2.38	11.75	250	0.59	91.4	45.81	26%
Rangeview Rd	33	32	2.69						2.19			154	839	2.94	3.85	11.31	14.61	2.92	14.24	250	0.61	92.0	46.54	31%
Rangeview Rd	32	31	1.43						1.04			73	912	3.20	3.83	12.23	16.04	3.21	15.43	250	1.10	82.9	62.45	25%
Rangeview Rd	31	9	0.00									0	912	3.20	3.83	12.23	16.04	3.21	15.43	250	0.53	11.0	43.20	36%
Subtotal			**16.04**									**912**	**912**				**16.04**							
East Ave	9	10	1.84									0	912	3.20	3.83	12.23	17.87	3.57	15.80	250	0.30	83.5	32.73	48%
East Ave (Treatment Plant Lateral)		10	12.85						12.85			900	1812	6.35	3.62	22.98	30.73	6.15	29.13					
Easment - West of East Ave	10	11	0.35									0	1812	6.35	3.62	22.98	31.07	6.21	29.19	300	0.29	90.5	52.04	56%
Easment - West of East Ave	11	12	0.16									0	1812	6.35	3.62	22.98	31.23	6.25	29.23	300	0.35	39.6	56.89	51%
Easment - West of East Ave	12	13	0.06									0	1812	6.35	3.62	22.98	31.29	6.26	29.24	300	0.37	66.1	58.71	50%
Subtotal			**31.29**									**1812**	**1812**				**31.29**							
Lateral from Montbeck North		13	1.73			1.73						87	87				1.73							
Montbeck Cres	13	19	0.11			0.11						6	1905	6.68	3.60	24.05	33.13	6.63	30.68	375	0.14	27.00	64.90	47%
Montbeck Cres	19	20	0.62			0.62						31	1936	6.78	3.60	24.40	33.75	6.75	31.15	375	0.38	40.54	107.71	29%

SANITARY SEWER DESIGN SHEET

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Designed By: P.W.
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Date: 2-Aug-23
Project No.: 4938

Rangeview Road Development
Pre-Development Condition

STREET	SECTION		RESIDENTIAL						OTHER											Sewer Design				Remarks
	From MH	To MH	Sect Area (ha)	Apart. (ha)	ROW (ha)	SF >10m front. (ha)	SF <10m front. (ha)	Semi Detac. (ha)	Ind. (@ 70 ppha) (ha)	Comm. (@ 50 ppha) (ha)	Inst.	Pop	Acc Pop	Avg Day (L/s)	Peaking Factor	Peak Day (L/s)	ACC AREA (ha)	Infiltration (L/s)	TOTAL Peak Flow (L/s)	Pipe Dia Act. (mm)	Grade (%)	Length (m)	Capacity (L/s)	
Montbeck Cres	20	21	0.58			0.58						29	1965	6.89	3.59	24.73	34.32	6.86	31.60	375	0.28	91.74	92.43	34%
Subtotal			**34.32**									**1965**	**1965**				**34.32**							
*Lateral from North Goodwin & West Montbeck**		21	29.50	0.21	0.38	11.67		0.479	1.32	5.05		1573	1573				29.50							
Goodwin Rd	21	31	0.70			0.70						35	3573	12.52	3.38	42.28	64.52	12.90	55.19	375	0.46	91.44	118.81	46%
Goodwin Rd	31	32	0.41			0.41						21	3594	12.60	3.37	42.50	64.93	12.99	55.49	375	0.29	92.35	94.49	59%
Subtotal			**64.93**									**3594**	**3594**				**64.93**							
Beach St	32	25	0.44			0.44						23	3617	12.68	3.37	42.75	65.38	13.08	55.82	375	0.33	98.00	100.97	55%
Beach St to PS	25	26	0.09						0.091			7	3624	12.70	3.37	42.82	65.47	13.09	55.91	300	0.17	24.99	40.35	139%
Subtotal			**65.47**									**3624**	**3624**				**65.47**							
*Lateral from West of PS via Aviation Rd**		26	44.78	0.43	19.12	12.29		1.333		3.53		7803	7803				44.78							
Subtotal for Rangeview Rd Downstream System			**110.25**									**11427**	**11427**	**40.05**	**2.90**	**116.01**	**110.25**	**22.05**	**138.06**					
Lakeshore Rd Western Downstream System																								
Lakeshore Rd E	121	111	1.70						0.868	0.434		83	83	0.29	4.26	1.24	1.70	0.34	1.58	250	0.60	66.87	46.06	3%
Lakeshore Rd E	111	110	0.56						0.452			32	115	0.40	4.23	1.70	2.25	0.45	2.15	250	0.74	73.91	51.16	4%
Lakeshore Rd E	110	109	1.77							0.921		47	162	0.57	4.18	2.37	4.02	0.80	3.18	250	0.69	49.68	49.40	6%
Lakeshore Rd E*	109	108	5.12			2.78				0.982		226	388	1.36	4.03	5.48	9.14	1.83	7.31	250	0.37	51.11	36.17	20%
Lakeshore Rd E	108	107	2.43			2.15				0.142		115	503	1.76	3.97	7.00	11.56	2.31	9.32	250	0.99	50.69	59.17	16%
Lakeshore Rd E	107	106	0.27							0.144		8	511	1.79	3.97	7.11	11.83	2.37	9.47	250	0.84	47.06	54.50	17%
Lakeshore Rd E	106	105	2.72	0.21		1.33						166	677	2.37	3.90	9.26	14.55	2.91	12.17	250	0.76	65.78	51.84	23%
Lakeshore Rd E	105	104	0.28							0.106		6	683	2.39	3.90	9.34	14.84	2.97	12.30	250	0.80	76.38	53.19	23%
Lakeshore Rd E	104	103	8.71		0.22	2.87		0.479		1.257		278	961	3.37	3.81	12.84	23.54	4.71	17.54	250	0.50	15.85	42.05	42%
Montbeck Cres	103	102	2.26		0.17					1.06		491	1452	5.09	3.69	18.78	25.80	5.16	23.94	250	0.46	86.26	40.33	59%
Byngmount Ave	102	101	0.79			0.79						40	1492	5.23	3.68	19.25	26.59	5.32	24.57	250	0.55	57.91	44.10	56%
Byngmount Ave	101	100	0.23			0.23						12	1504	5.27	3.68	19.39	26.82	5.36	24.75	250	0.44	49.07	39.45	63%
Goodwin Ave	100	99	1.42			1.01						51	1555	5.45	3.67	19.99	28.24	5.65	25.64	250	0.51	91.44	42.47	60%
Goodwin Ave	99	21	0.75			0.50						26	1581	5.54	3.66	20.30	28.99	5.80	26.09	250	0.49	96.32	41.63	63%
Subtotal			**28.99**									**1581**	**1581**				**28.99**							
Lateral from east of MH21		21	34.32									1965	1965				34.32							
Lateral from west of MH 21		21	0.51			0.25						13	1978				34.83							
Subtotal			**63.83**									**3559**	**3559**				**63.83**							
Goodwin Rd	21	31	0.70			0.70						35	3594	12.60	3.37	42.50	64.52	12.90	55.41	375	0.46	91.44	118.81	47%
Goodwin Rd	31	32	0.41			0.41						21	3615	12.67	3.37	42.73	64.93	12.99	55.71	375	0.29	92.35	94.49	59%
Subtotal			**64.93**									**3594**	**3594**				**64.93**							
Beach St	32	25	0.44			0.44						23	3617	12.68	3.37	42.75	65.38	13.08	55.82	375	0.33	98.00	100.97	55%
Beach St to PS	25	26	0.09						0.091			7	3624	12.70	3.37	42.82	65.47	13.09	55.91	300	0.17	24.99	40.35	139%

SCHAEFFERS
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SANITARY SEWER DESIGN SHEET

CITY OF MISSISSAUGA

Rangeview Road Development
Pre-Development Condition

Designed By: P.W.
Checked By: K.Sh
Date: 2-Aug-23
Project No.: 4938

STREET	SECTION		RESIDENTIAL						OTHER											Sewer Design				
	From MH	To MH	Sect Area (ha)	Apart. (ha)	ROW (ha)	SF >10m front. (ha)	SF <10m front. (ha)	Semi Detac. (ha)	Ind. (@ 70 ppha) (ha)	Comm. (@ 50 ppha) (ha)	Inst.	Pop	Acc Pop	Avg Day (L/s)	Peaking Factor	Peak Day (L/s)	ACC AREA (ha)	Infiltration (L/s)	TOTAL Peak Flow (L/s)	Pipe Dia Act. (mm)	Grade (%)	Length (m)	Capacity (L/s)	Remarks
Subtotal			**65.47**									**3624**	**3624**				**65.47**							
*Lateral from West of PS via Aviation Rd**		26	44.82	0.43	19.12	12.29		1.333		3.53		7803	7803				44.82							
Subtotal for Lakeshore Rd Western Downstream System			**110.29**									**11427**	**11427**	**40.05**	**2.90**	**116.01**	**110.29**	**22.06**	**138.07**					
Lakeshore Rd Eastern Downstream System																								
Lakeshore Rd E	7	6	1.06						0.70			50	50	0.18	4.31	0.76	1.06	0.21	0.97	300	0.35	86.26	57.19	2%
Lakeshore Rd E	6	5	1.29						1.074			76	126	0.44	4.21	1.86	2.35	0.47	2.33	300	0.23	91.44	46.71	5%
Lakeshore Rd E	5	4	1.91						0.783	0.858		98	224	0.79	4.13	3.24	4.27	0.85	4.10	300	0.38	91.44	59.35	7%
Lakeshore Rd E	4	3	0.84						0.70			49	273	0.96	4.10	3.92	5.11	1.02	4.94	300	0.20	62.48	42.72	12%
Lakeshore Rd E	3	2	0.00						0.00			0	273	0.96	4.10	3.92	5.11	1.02	4.94	300	0.43	63.70	63.10	8%
Lakeshore Rd E	2	1	1.57						1.356			95	368	1.29	4.04	5.21	6.68	1.34	6.54	300	0.34	65.99	56.15	12%
Lakeshore Rd E	1	001	0.00									0	368	1.29	4.04	5.21	6.68	1.34	6.54	300	1.56	28.50	120.70	5%
Lakeshore Rd E*	001	002	126.88		2.04	86.34				2.409	1600	7076	7444	26.09	3.08	80.37	133.56	26.71	107.08	600	0.34	119.00	355.99	30%
Lakeshore Rd E	002	003	3.81									0	7444	26.09	3.08	80.37	137.37	27.47	107.85	600	0.11	91.00	203.54	53%
Subtotal for Lakeshore Rd Eastern Downstream System			**137.37**									**7444**	**7444**				**137.37**							

** Denotes Development Application included from City*

SANITARY SEWER DESIGN SHEET

CITY OF MISSISSAUGA

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Rangeview Road Development
Ultimate Conditions

STREET	SECTION		RESIDENTIAL					OTHER											Sewer Design					
	From MH	To MH	Sect Area (ha)	Apart. (ha)	ROW (ha)	SF (ha)	Semi Detac. (ha)	Ind. (@ 70 ppha) (ha)	Comm. (@ 50 ppha) (ha)	Inst.	Pop	Acc Pop	Avg Day (L/s)	Peaking Factor	Peak Day (L/s)	ACC AREA (ha)	Infiltration (L/s)	TOTAL Peak Flow (L/s)	Length (m)	Full V. (m/s)	Prop. Grade (%)	Proposed Pipe Dia Act. (mm)	Proposed Capacity (L/s)	Proposed Ratio
Design Criteria																								
Residential																								
Rowhouses / Other Multiples	*3.5*	*persons/unit*																						
Apartments	*2.7*	*persons/unit*																						
SF (> 10m frontage)	*50*	*persons/ha*																						
SF(< 10m frontage)	*70*	*persons/ha*																						
Semi-Detached	*70*	*persons/ha*																						
ICI																								
Industrial	*70*	*persons/ha*																						
Commercial	*50*	*persons/ha*																						
Infiltration	*0.20*	*L/s/ha*																						
Average Domestic Flow	*302.80*	*L/c/d*																						
Rangeview Rd	40	39	1.45	605	51						1814	1814	6.36	3.62	23.00	1.45	0.29	23.29	93.6	0.64	1.00	250	59.47	39%
Rangeview Rd	39	38	1.39	54							146	1960	6.87	3.59	24.68	2.83	0.57	25.24	91.1	0.70	0.35	250	35.18	72%
Rangeview Rd	38	37	7.03	1599	156				0.454		4893	6853	24.02	3.12	74.83	9.86	1.97	76.80	91.3	0.67	0.35	**375**	103.73	74%
Rangeview Rd	37	36	1.45		18						63	6916	24.24	3.11	75.42	11.31	2.26	77.68	91.9	0.60	0.35	**375**	103.73	75%
Rangeview Rd	36	35	1.77	522	76						1677	8593	30.12	3.02	90.94	13.08	2.62	93.56	91.0	0.74	0.35	**450**	168.67	55%
Rangeview Rd	35	34	3.58	822					0.198		2232	10825	37.94	2.92	110.79	16.66	3.33	114.13	90.2	0.80	0.35	**450**	168.67	68%
Rangeview Rd	34	33	2.99	358	119				1.050		1834	12659	44.37	2.85	126.55	19.65	3.93	130.47	91.4	0.93	0.35	**450**	168.67	77%
Rangeview Rd	33	32	2.92	199	101						892	13551	47.49	2.82	134.05	22.57	4.51	138.56	92.0	0.95	0.35	**450**	168.67	82%
Rangeview Rd	32	31									0	13551	47.49	2.82	134.05	22.57	4.51	138.56	82.9	1.27	0.35	**450**	168.67	82%
Rangeview Rd to East Ave	31	9									0	13551	47.49	2.82	134.05	22.57	4.51	138.56	11.0	0.88	0.35	**450**	168.67	82%
East Ave to Lakeshore Rd E *(Proposed Subtrunk Sewer)*	8	7	2.25	568	52				0.151		1725	15276	53.54	2.77	148.31	24.82	4.96	153.27	108.1		0.35	**525**	254.43	60%
Subtotal for Rangeview Rd Downstream System			**24.82**	**4727**	**573**				**1.853**		**15276**	**15276**				**24.82**								

Appendix D
Stormwater Management Support Information

Project 4938 Rangeview Estates Development
Site Plan SWM Requirements Summary

SCHAEFFERS
CONSULTING ENGINEERS

Rainfall intensity

Rainfall Intensity-City of Mississauga

Design Storm Event	A	B	C	I (mm/hr)
2-Year	610.0	4.6	0.78	59.9
5-Year	820.0	4.6	0.78	80.5
10-Year	1010.0	4.6	0.78	99.2
25-Year	1160.0	4.6	0.78	113.9
50-Year	1300.0	4.7	0.78	127.1
100-Year	1450.0	4.9	0.780	140.7

Tc= 15 minutes

I=A/((T+B)^C)

Description	Catchment #	Area (ha)	Pre-Development Runoff Coefficent	Post-Development Runoff Coefficent	Allowable Release (10-year flows) Rate (L/s)	Assumed Groundwater Pump Rate Rate (L/s) **	Adjusted Allowable Release Rate from Site Plan(10-year flows - Longterm Ground Water Pumping) (L/s)	Required On-site storage (m3)	Volumetric Requirement (m3)* (5mm)
					A	B	C= A-B		
Site Plan	201	0.52	0.50	0.90	71.62	2.00	69.62	121.68	26.00
Site Plan	202	0.76	0.50	0.90	104.67	2.00	102.67	176.84	38.00
Site Plan	203	0.39	0.50	0.90	53.71	2.00	51.71	91.80	19.50
Site Plan	204	0.39	0.50	0.90	53.71	2.00	51.71	91.80	19.50
Site Plan	205	0.48	0.50	0.90	66.11	2.00	64.11	112.48	24.00
Site Plan	206	0.54	0.50	0.90	74.37	2.00	72.37	126.27	27.00
Site Plan	207	0.93	0.50	0.90	128.09	2.00	126.09	215.91	46.50
Site Plan	208	0.92	0.50	0.90	126.71	2.00	124.71	213.61	46.00
Site Plan	209	0.58	0.50	0.90	79.88	2.00	77.88	135.47	29.00
Site Plan	210	0.84	0.50	0.90	115.69	2.00	113.69	195.22	42.00
Site Plan	211	0.86	0.50	0.90	118.45	2.00	116.45	199.82	43.00
Site Plan	212	0.20	0.50	0.90	27.55	2.00	25.55	48.18	10.00
Site Plan	213	0.40	0.50	0.90	55.09	2.00	53.09	94.10	20.00
Site Plan	214	0.34	0.50	0.90	46.83	2.00	44.83	80.31	17.00
Site Plan	215	0.82	0.50	0.90	112.94	2.00	110.94	190.63	41.00
Site Plan	216	0.19	0.50	0.90	26.17	2.00	24.17	45.89	9.50
Site Plan	217	0.36	0.50	0.90	49.58	2.00	47.58	84.90	18.00
Site Plan	218	0.58	0.50	0.90	79.88	2.00	77.88	135.47	29.00
Site Plan	219	0.57	0.50	0.90	78.51	2.00	76.51	133.17	28.50
Site Plan	220	1.00	0.50	0.90	137.73	2.00	135.73	232.00	50.00
Site Plan	221	1.30	0.50	0.90	179.05	2.00	177.05	300.95	65.00
Site Plan	222	0.74	0.50	0.90	101.92	2.00	99.92	172.24	37.00
Site Plan	223	0.82	0.50	0.90	112.94	2.00	110.94	190.63	41.00
Site Plan	224	0.46	0.50	0.90	63.36	2.00	61.36	107.89	23.00
Site Plan	225	0.38	0.50	0.90	52.34	2.00	50.34	89.50	19.00
Site Plan	226	0.61	0.50	0.90	84.02	2.00	82.02	142.36	30.50
Site Plan	227	0.32	0.50	0.90	44.07	2.00	42.07	75.72	16.00
Site Plan	228	0.35	0.50	0.90	48.21	2.00	46.21	82.61	17.50

* Volumetric Requirement =Area x TIMP x 5mm x 10

**2L/s is assumed as the groundwater pumping rate to storm sewers (a higher rate was selected based on feasibility and to be higher than the preliminary hydro-geotechnical investigation) and will be finalized through the SPA process (This discharge was subtracted from the allowable release rates)

Storage Volume Calculation

Project: 4938 Catchment 201

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.520
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	69.62
	Actual Release Rate (l/s) =	69.62
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	203.38	0.00	0.00	203.38	183.04	62.66	120.39
16	135.41	195.75	0.00	0.00	195.75	187.92	66.83	121.09
17	130.56	188.74	0.00	0.00	188.74	192.52	71.01	121.51
18	126.09	182.28	0.00	0.00	182.28	196.86	75.19	121.68
19	121.96	176.31	0.00	0.00	176.31	200.99	79.37	121.62
20	118.12	170.76	0.00	0.00	170.76	204.91	83.54	121.37
21	114.55	165.59	0.00	0.00	165.59	208.65	87.72	120.93
22	111.21	160.77	0.00	0.00	160.77	212.22	91.90	120.32
23	108.09	156.26	0.00	0.00	156.26	215.64	96.08	119.56
24	105.16	152.03	0.00	0.00	152.03	218.92	100.25	118.66
25	102.41	148.04	0.00	0.00	148.04	222.07	104.43	117.64
26	99.82	144.29	0.00	0.00	144.29	225.10	108.61	116.49
27	97.37	140.75	0.00	0.00	140.75	228.02	112.78	115.24
85	43.39	62.73	0.00	0.00	62.73	319.93	355.06	0.00
90	41.60	60.14	0.00	0.00	60.14	324.74	375.95	0.00
100	38.47	55.62	0.00	0.00	55.62	333.70	417.72	0.00
105	37.10	53.63	0.00	0.00	53.63	337.89	438.60	0.00
110	35.84	51.80	0.00	0.00	51.80	341.91	459.49	0.00
115	34.66	50.11	0.00	0.00	50.11	345.77	480.38	0.00
120	33.58	48.54	0.00	0.00	48.54	349.49	501.26	0.00
125	32.57	47.08	0.00	0.00	47.08	353.07	522.15	0.00
130	31.62	45.71	0.00	0.00	45.71	356.53	543.03	0.00
135	30.73	44.43	0.00	0.00	44.43	359.88	563.92	0.00
140	29.90	43.23	0.00	0.00	43.23	363.13	584.81	0.00

Required Storage (m^3):	**121.68**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 202

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.760
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	102.67
	Actual Release Rate (l/s) =	102.67
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	297.25	0.00	0.00	297.25	267.52	92.41	175.12
16	135.41	286.10	0.00	0.00	286.10	274.65	98.57	176.08
17	130.56	275.85	0.00	0.00	275.85	281.37	104.73	176.64
18	126.09	266.41	0.00	0.00	266.41	287.73	110.89	176.84
19	121.96	257.68	0.00	0.00	257.68	293.75	117.05	176.70
20	118.12	249.57	0.00	0.00	249.57	299.48	123.21	176.27
21	114.55	242.02	0.00	0.00	242.02	304.95	129.37	175.58
22	111.21	234.97	0.00	0.00	234.97	310.17	135.53	174.63
23	108.09	228.38	0.00	0.00	228.38	315.16	141.69	173.47
24	105.16	222.19	0.00	0.00	222.19	319.95	147.85	172.10
25	102.41	216.37	0.00	0.00	216.37	324.56	154.01	170.55
26	99.82	210.89	0.00	0.00	210.89	328.99	160.17	168.82
27	97.37	205.72	0.00	0.00	205.72	333.26	166.33	166.93
85	43.39	91.68	0.00	0.00	91.68	467.59	523.64	0.00
90	41.60	87.89	0.00	0.00	87.89	474.63	554.44	0.00
100	38.47	81.29	0.00	0.00	81.29	487.72	616.05	0.00
105	37.10	78.39	0.00	0.00	78.39	493.84	646.85	0.00
110	35.84	75.71	0.00	0.00	75.71	499.71	677.65	0.00
115	34.66	73.24	0.00	0.00	73.24	505.35	708.46	0.00
120	33.58	70.94	0.00	0.00	70.94	510.79	739.26	0.00
125	32.57	68.80	0.00	0.00	68.80	516.03	770.06	0.00
130	31.62	66.81	0.00	0.00	66.81	521.09	800.86	0.00
135	30.73	64.94	0.00	0.00	64.94	525.99	831.67	0.00
140	29.90	63.18	0.00	0.00	63.18	530.73	862.47	0.00

Required Storage (m^3):	**176.84**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 203

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.390
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	51.71
	Actual Release Rate (l/s) =	51.71
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	152.54	0.00	0.00	152.54	137.28	46.54	90.74
16	135.41	146.81	0.00	0.00	146.81	140.94	49.65	91.29
17	130.56	141.56	0.00	0.00	141.56	144.39	52.75	91.64
18	126.09	136.71	0.00	0.00	136.71	147.65	55.85	91.80
19	121.96	132.23	0.00	0.00	132.23	150.74	58.95	91.79
20	118.12	128.07	0.00	0.00	128.07	153.68	62.06	91.62
21	114.55	124.19	0.00	0.00	124.19	156.49	65.16	91.32
22	111.21	120.58	0.00	0.00	120.58	159.16	68.26	90.90
23	108.09	117.19	0.00	0.00	117.19	161.73	71.37	90.36
24	105.16	114.02	0.00	0.00	114.02	164.19	74.47	89.72
25	102.41	111.03	0.00	0.00	111.03	166.55	77.57	88.98
26	99.82	108.22	0.00	0.00	108.22	168.82	80.68	88.15
27	97.37	105.57	0.00	0.00	105.57	171.02	83.78	87.24
85	43.39	47.05	0.00	0.00	47.05	239.95	263.75	0.00
90	41.60	45.10	0.00	0.00	45.10	243.56	279.26	0.00
100	38.47	41.71	0.00	0.00	41.71	250.28	310.29	0.00
105	37.10	40.23	0.00	0.00	40.23	253.42	325.80	0.00
110	35.84	38.85	0.00	0.00	38.85	256.43	341.32	0.00
115	34.66	37.58	0.00	0.00	37.58	259.33	356.83	0.00
120	33.58	36.40	0.00	0.00	36.40	262.11	372.35	0.00
125	32.57	35.31	0.00	0.00	35.31	264.80	387.86	0.00
130	31.62	34.28	0.00	0.00	34.28	267.40	403.38	0.00
135	30.73	33.32	0.00	0.00	33.32	269.91	418.89	0.00
140	29.90	32.42	0.00	0.00	32.42	272.35	434.40	0.00

Required Storage (m^3):	**91.80**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 204

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.390
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	51.71
	Actual Release Rate (l/s) =	51.71
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	152.54	0.00	0.00	152.54	137.28	46.54	90.74
16	135.41	146.81	0.00	0.00	146.81	140.94	49.65	91.29
17	130.56	141.56	0.00	0.00	141.56	144.39	52.75	91.64
18	126.09	136.71	0.00	0.00	136.71	147.65	55.85	91.80
19	121.96	132.23	0.00	0.00	132.23	150.74	58.95	91.79
20	118.12	128.07	0.00	0.00	128.07	153.68	62.06	91.62
21	114.55	124.19	0.00	0.00	124.19	156.49	65.16	91.32
22	111.21	120.58	0.00	0.00	120.58	159.16	68.26	90.90
23	108.09	117.19	0.00	0.00	117.19	161.73	71.37	90.36
24	105.16	114.02	0.00	0.00	114.02	164.19	74.47	89.72
25	102.41	111.03	0.00	0.00	111.03	166.55	77.57	88.98
26	99.82	108.22	0.00	0.00	108.22	168.82	80.68	88.15
27	97.37	105.57	0.00	0.00	105.57	171.02	83.78	87.24
85	43.39	47.05	0.00	0.00	47.05	239.95	263.75	0.00
90	41.60	45.10	0.00	0.00	45.10	243.56	279.26	0.00
100	38.47	41.71	0.00	0.00	41.71	250.28	310.29	0.00
105	37.10	40.23	0.00	0.00	40.23	253.42	325.80	0.00
110	35.84	38.85	0.00	0.00	38.85	256.43	341.32	0.00
115	34.66	37.58	0.00	0.00	37.58	259.33	356.83	0.00
120	33.58	36.40	0.00	0.00	36.40	262.11	372.35	0.00
125	32.57	35.31	0.00	0.00	35.31	264.80	387.86	0.00
130	31.62	34.28	0.00	0.00	34.28	267.40	403.38	0.00
135	30.73	33.32	0.00	0.00	33.32	269.91	418.89	0.00
140	29.90	32.42	0.00	0.00	32.42	272.35	434.40	0.00

Required Storage (m^3):	**91.80**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 205

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.480
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	64.11
	Actual Release Rate (l/s) =	64.11
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	187.74	0.00	0.00	187.74	168.96	57.70	111.26
16	135.41	180.69	0.00	0.00	180.69	173.46	61.55	111.92
17	130.56	174.22	0.00	0.00	174.22	177.71	65.39	112.32
18	126.09	168.26	0.00	0.00	168.26	181.72	69.24	112.48
19	121.96	162.74	0.00	0.00	162.74	185.53	73.09	112.44
20	118.12	157.62	0.00	0.00	157.62	189.15	76.93	112.21
21	114.55	152.86	0.00	0.00	152.86	192.60	80.78	111.82
22	111.21	148.40	0.00	0.00	148.40	195.89	84.63	111.27
23	108.09	144.24	0.00	0.00	144.24	199.05	88.47	110.58
24	105.16	140.33	0.00	0.00	140.33	202.08	92.32	109.76
25	102.41	136.66	0.00	0.00	136.66	204.98	96.17	108.82
26	99.82	133.19	0.00	0.00	133.19	207.78	100.01	107.77
27	97.37	129.93	0.00	0.00	129.93	210.48	103.86	106.62
85	43.39	57.91	0.00	0.00	57.91	295.32	326.96	0.00
90	41.60	55.51	0.00	0.00	55.51	299.76	346.20	0.00
100	38.47	51.34	0.00	0.00	51.34	308.04	384.66	0.00
105	37.10	49.51	0.00	0.00	49.51	311.90	403.90	0.00
110	35.84	47.82	0.00	0.00	47.82	315.61	423.13	0.00
115	34.66	46.26	0.00	0.00	46.26	319.17	442.36	0.00
120	33.58	44.81	0.00	0.00	44.81	322.60	461.60	0.00
125	32.57	43.45	0.00	0.00	43.45	325.91	480.83	0.00
130	31.62	42.19	0.00	0.00	42.19	329.11	500.06	0.00
135	30.73	41.01	0.00	0.00	41.01	332.20	519.29	0.00
140	29.90	39.90	0.00	0.00	39.90	335.20	538.53	0.00

Required Storage (m^3):	**112.48**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 206

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.540
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	72.37
	Actual Release Rate (l/s) =	72.37
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	211.20	0.00	0.00	211.20	190.08	65.14	124.95
16	135.41	203.28	0.00	0.00	203.28	195.15	69.48	125.67
17	130.56	196.00	0.00	0.00	196.00	199.92	73.82	126.10
18	126.09	189.29	0.00	0.00	189.29	204.44	78.16	126.27
19	121.96	183.09	0.00	0.00	183.09	208.72	82.51	126.21
20	118.12	177.33	0.00	0.00	177.33	212.79	86.85	125.94
21	114.55	171.96	0.00	0.00	171.96	216.67	91.19	125.48
22	111.21	166.96	0.00	0.00	166.96	220.38	95.53	124.85
23	108.09	162.27	0.00	0.00	162.27	223.93	99.88	124.05
24	105.16	157.87	0.00	0.00	157.87	227.34	104.22	123.12
25	102.41	153.74	0.00	0.00	153.74	230.61	108.56	122.05
26	99.82	149.84	0.00	0.00	149.84	233.76	112.90	120.85
27	97.37	146.17	0.00	0.00	146.17	236.79	117.25	119.54
85	43.39	65.14	0.00	0.00	65.14	332.23	369.11	0.00
90	41.60	62.45	0.00	0.00	62.45	337.24	390.82	0.00
100	38.47	57.76	0.00	0.00	57.76	346.54	434.25	0.00
105	37.10	55.70	0.00	0.00	55.70	350.89	455.96	0.00
110	35.84	53.80	0.00	0.00	53.80	355.06	477.67	0.00
115	34.66	52.04	0.00	0.00	52.04	359.07	499.38	0.00
120	33.58	50.41	0.00	0.00	50.41	362.93	521.09	0.00
125	32.57	48.89	0.00	0.00	48.89	366.65	542.81	0.00
130	31.62	47.47	0.00	0.00	47.47	370.25	564.52	0.00
135	30.73	46.14	0.00	0.00	46.14	373.73	586.23	0.00
140	29.90	44.89	0.00	0.00	44.89	377.10	607.94	0.00

Required Storage (m^3):	**126.27**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 207

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.930
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	126.09
	Actual Release Rate (l/s) =	126.09
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	363.74	0.00	0.00	363.74	327.37	113.48	213.89
16	135.41	350.09	0.00	0.00	350.09	336.09	121.05	215.04
17	130.56	337.56	0.00	0.00	337.56	344.31	128.61	215.70
18	126.09	326.00	0.00	0.00	326.00	352.09	136.18	215.91
19	121.96	315.32	0.00	0.00	315.32	359.46	143.74	215.72
20	118.12	305.39	0.00	0.00	305.39	366.47	151.31	215.17
21	114.55	296.16	0.00	0.00	296.16	373.16	158.87	214.29
22	111.21	287.53	0.00	0.00	287.53	379.54	166.44	213.11
23	108.09	279.46	0.00	0.00	279.46	385.66	174.00	211.66
24	105.16	271.89	0.00	0.00	271.89	391.52	181.57	209.96
25	102.41	264.77	0.00	0.00	264.77	397.16	189.13	208.02
26	99.82	258.06	0.00	0.00	258.06	402.58	196.70	205.88
27	97.37	251.73	0.00	0.00	251.73	407.81	204.26	203.54
85	43.39	112.19	0.00	0.00	112.19	572.18	643.05	0.00
90	41.60	107.55	0.00	0.00	107.55	580.79	680.88	0.00
100	38.47	99.47	0.00	0.00	99.47	596.82	756.53	0.00
105	37.10	95.92	0.00	0.00	95.92	604.31	794.36	0.00
110	35.84	92.65	0.00	0.00	92.65	611.49	832.19	0.00
115	34.66	89.62	0.00	0.00	89.62	618.39	870.01	0.00
120	33.58	86.81	0.00	0.00	86.81	625.04	907.84	0.00
125	32.57	84.19	0.00	0.00	84.19	631.45	945.67	0.00
130	31.62	81.75	0.00	0.00	81.75	637.65	983.49	0.00
135	30.73	79.46	0.00	0.00	79.46	643.64	1021.32	0.00
140	29.90	77.31	0.00	0.00	77.31	649.44	1059.15	0.00

Required Storage (m^3):	**215.91**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 208

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.920
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	124.71
	Actual Release Rate (l/s) =	124.71
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	359.83	0.00	0.00	359.83	323.85	112.24	211.60
16	135.41	346.33	0.00	0.00	346.33	332.47	119.72	212.75
17	130.56	333.93	0.00	0.00	333.93	340.61	127.21	213.40
18	126.09	322.50	0.00	0.00	322.50	348.30	134.69	213.61
19	121.96	311.93	0.00	0.00	311.93	355.59	142.17	213.42
20	118.12	302.11	0.00	0.00	302.11	362.53	149.65	212.88
21	114.55	292.97	0.00	0.00	292.97	369.15	157.14	212.01
22	111.21	284.44	0.00	0.00	284.44	375.46	164.62	210.84
23	108.09	276.46	0.00	0.00	276.46	381.51	172.10	209.41
24	105.16	268.97	0.00	0.00	268.97	387.31	179.58	207.73
25	102.41	261.93	0.00	0.00	261.93	392.89	187.07	205.82
26	99.82	255.29	0.00	0.00	255.29	398.25	194.55	203.70
27	97.37	249.03	0.00	0.00	249.03	403.42	202.03	201.39
85	43.39	110.99	0.00	0.00	110.99	566.03	636.03	0.00
90	41.60	106.40	0.00	0.00	106.40	574.55	673.44	0.00
100	38.47	98.40	0.00	0.00	98.40	590.40	748.27	0.00
105	37.10	94.89	0.00	0.00	94.89	597.81	785.68	0.00
110	35.84	91.65	0.00	0.00	91.65	604.92	823.10	0.00
115	34.66	88.66	0.00	0.00	88.66	611.75	860.51	0.00
120	33.58	85.88	0.00	0.00	85.88	618.32	897.92	0.00
125	32.57	83.29	0.00	0.00	83.29	624.66	935.34	0.00
130	31.62	80.87	0.00	0.00	80.87	630.79	972.75	0.00
135	30.73	78.61	0.00	0.00	78.61	636.72	1010.17	0.00
140	29.90	76.48	0.00	0.00	76.48	642.46	1047.58	0.00

Required Storage (m^3):	**213.61**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 209

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.580
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	77.88
	Actual Release Rate (l/s) =	77.88
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	226.85	0.00	0.00	226.85	204.16	70.10	134.07
16	135.41	218.34	0.00	0.00	218.34	209.60	74.77	134.84
17	130.56	210.52	0.00	0.00	210.52	214.73	79.44	135.29
18	126.09	203.31	0.00	0.00	203.31	219.58	84.11	135.47
19	121.96	196.65	0.00	0.00	196.65	224.18	88.79	135.39
20	118.12	190.46	0.00	0.00	190.46	228.55	93.46	135.09
21	114.55	184.70	0.00	0.00	184.70	232.72	98.13	134.59
22	111.21	179.32	0.00	0.00	179.32	236.71	102.81	133.90
23	108.09	174.29	0.00	0.00	174.29	240.52	107.48	133.04
24	105.16	169.57	0.00	0.00	169.57	244.18	112.15	132.02
25	102.41	165.13	0.00	0.00	165.13	247.69	116.83	130.86
26	99.82	160.94	0.00	0.00	160.94	251.07	121.50	129.57
27	97.37	156.99	0.00	0.00	156.99	254.33	126.17	128.16
85	43.39	69.97	0.00	0.00	69.97	356.84	397.21	0.00
90	41.60	67.08	0.00	0.00	67.08	362.22	420.57	0.00
100	38.47	62.03	0.00	0.00	62.03	372.21	467.30	0.00
105	37.10	59.82	0.00	0.00	59.82	376.88	490.67	0.00
110	35.84	57.78	0.00	0.00	57.78	381.36	514.03	0.00
115	34.66	55.89	0.00	0.00	55.89	385.67	537.40	0.00
120	33.58	54.14	0.00	0.00	54.14	389.81	560.76	0.00
125	32.57	52.51	0.00	0.00	52.51	393.81	584.13	0.00
130	31.62	50.98	0.00	0.00	50.98	397.67	607.49	0.00
135	30.73	49.56	0.00	0.00	49.56	401.41	630.86	0.00
140	29.90	48.22	0.00	0.00	48.22	405.03	654.22	0.00

Required Storage (m^3):	**135.47**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 210

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.840
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	113.69
	Actual Release Rate (l/s) =	113.69
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	328.54	0.00	0.00	328.54	295.68	102.32	193.36
16	135.41	316.21	0.00	0.00	316.21	303.56	109.15	194.42
17	130.56	304.89	0.00	0.00	304.89	310.99	115.97	195.02
18	126.09	294.46	0.00	0.00	294.46	318.01	122.79	195.22
19	121.96	284.80	0.00	0.00	284.80	324.67	129.61	195.06
20	118.12	275.84	0.00	0.00	275.84	331.01	136.43	194.58
21	114.55	267.50	0.00	0.00	267.50	337.05	143.25	193.79
22	111.21	259.71	0.00	0.00	259.71	342.81	150.08	192.74
23	108.09	252.42	0.00	0.00	252.42	348.34	156.90	191.44
24	105.16	245.58	0.00	0.00	245.58	353.63	163.72	189.92
25	102.41	239.15	0.00	0.00	239.15	358.72	170.54	188.18
26	99.82	233.09	0.00	0.00	233.09	363.62	177.36	186.26
27	97.37	227.37	0.00	0.00	227.37	368.34	184.18	184.16
85	43.39	101.34	0.00	0.00	101.34	516.81	579.84	0.00
90	41.60	97.15	0.00	0.00	97.15	524.59	613.94	0.00
100	38.47	89.84	0.00	0.00	89.84	539.06	682.16	0.00
105	37.10	86.64	0.00	0.00	86.64	545.83	716.27	0.00
110	35.84	83.68	0.00	0.00	83.68	552.31	750.38	0.00
115	34.66	80.95	0.00	0.00	80.95	558.55	784.48	0.00
120	33.58	78.41	0.00	0.00	78.41	564.55	818.59	0.00
125	32.57	76.05	0.00	0.00	76.05	570.35	852.70	0.00
130	31.62	73.84	0.00	0.00	73.84	575.94	886.81	0.00
135	30.73	71.77	0.00	0.00	71.77	581.35	920.92	0.00
140	29.90	69.83	0.00	0.00	69.83	586.59	955.02	0.00

Required Storage (m^3):	**195.22**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 211

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.860
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	116.45
	Actual Release Rate (l/s) =	116.45
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	336.36	0.00	0.00	336.36	302.73	104.80	197.92
16	135.41	323.74	0.00	0.00	323.74	310.79	111.79	199.00
17	130.56	312.15	0.00	0.00	312.15	318.39	118.78	199.62
18	126.09	301.47	0.00	0.00	301.47	325.58	125.76	199.82
19	121.96	291.58	0.00	0.00	291.58	332.40	132.75	199.65
20	118.12	282.41	0.00	0.00	282.41	338.89	139.74	199.15
21	114.55	273.87	0.00	0.00	273.87	345.07	146.72	198.35
22	111.21	265.89	0.00	0.00	265.89	350.98	153.71	197.27
23	108.09	258.43	0.00	0.00	258.43	356.63	160.70	195.93
24	105.16	251.43	0.00	0.00	251.43	362.05	167.69	194.37
25	102.41	244.84	0.00	0.00	244.84	367.26	174.67	192.59
26	99.82	238.64	0.00	0.00	238.64	372.28	181.66	190.62
27	97.37	232.78	0.00	0.00	232.78	377.11	188.65	188.47
85	43.39	103.75	0.00	0.00	103.75	529.11	593.88	0.00
90	41.60	99.46	0.00	0.00	99.46	537.08	628.82	0.00
100	38.47	91.98	0.00	0.00	91.98	551.90	698.69	0.00
105	37.10	88.70	0.00	0.00	88.70	558.82	733.62	0.00
110	35.84	85.68	0.00	0.00	85.68	565.46	768.56	0.00
115	34.66	82.88	0.00	0.00	82.88	571.85	803.49	0.00
120	33.58	80.28	0.00	0.00	80.28	578.00	838.43	0.00
125	32.57	77.86	0.00	0.00	77.86	583.93	873.36	0.00
130	31.62	75.60	0.00	0.00	75.60	589.65	908.29	0.00
135	30.73	73.48	0.00	0.00	73.48	595.19	943.23	0.00
140	29.90	71.50	0.00	0.00	71.50	600.56	978.16	0.00

Required Storage (m^3):	**199.82**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 212

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.200
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	25.55
	Actual Release Rate (l/s) =	25.55
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	78.22	0.00	0.00	78.22	70.40	22.99	47.41
16	135.41	75.29	0.00	0.00	75.29	72.28	24.52	47.75
17	130.56	72.59	0.00	0.00	72.59	74.05	26.06	47.99
18	126.09	70.11	0.00	0.00	70.11	75.72	27.59	48.13
19	121.96	67.81	0.00	0.00	67.81	77.30	29.12	48.18
20	118.12	65.68	0.00	0.00	65.68	78.81	30.66	48.16
21	114.55	63.69	0.00	0.00	63.69	80.25	32.19	48.06
22	111.21	61.84	0.00	0.00	61.84	81.62	33.72	47.90
23	108.09	60.10	0.00	0.00	60.10	82.94	35.25	47.68
24	105.16	58.47	0.00	0.00	58.47	84.20	36.79	47.41
25	102.41	56.94	0.00	0.00	56.94	85.41	38.32	47.09
26	99.82	55.50	0.00	0.00	55.50	86.58	39.85	46.72
27	97.37	54.14	0.00	0.00	54.14	87.70	41.38	46.32
85	43.39	24.13	0.00	0.00	24.13	123.05	130.28	0.00
90	41.60	23.13	0.00	0.00	23.13	124.90	137.95	0.00
100	38.47	21.39	0.00	0.00	21.39	128.35	153.28	0.00
105	37.10	20.63	0.00	0.00	20.63	129.96	160.94	0.00
110	35.84	19.92	0.00	0.00	19.92	131.50	168.60	0.00
115	34.66	19.27	0.00	0.00	19.27	132.99	176.27	0.00
120	33.58	18.67	0.00	0.00	18.67	134.42	183.93	0.00
125	32.57	18.11	0.00	0.00	18.11	135.80	191.60	0.00
130	31.62	17.58	0.00	0.00	17.58	137.13	199.26	0.00
135	30.73	17.09	0.00	0.00	17.09	138.42	206.92	0.00
140	29.90	16.63	0.00	0.00	16.63	139.67	214.59	0.00

Required Storage (m^3):	**48.18**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 213

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.400
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	53.09
	Actual Release Rate (l/s) =	53.09
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	156.45	0.00	0.00	156.45	140.80	47.78	93.02
16	135.41	150.58	0.00	0.00	150.58	144.55	50.97	93.59
17	130.56	145.19	0.00	0.00	145.19	148.09	54.15	93.94
18	126.09	140.22	0.00	0.00	140.22	151.43	57.34	94.10
19	121.96	135.62	0.00	0.00	135.62	154.61	60.52	94.08
20	118.12	131.35	0.00	0.00	131.35	157.62	63.71	93.91
21	114.55	127.38	0.00	0.00	127.38	160.50	66.90	93.60
22	111.21	123.67	0.00	0.00	123.67	163.25	70.08	93.16
23	108.09	120.20	0.00	0.00	120.20	165.87	73.27	92.61
24	105.16	116.94	0.00	0.00	116.94	168.40	76.45	91.94
25	102.41	113.88	0.00	0.00	113.88	170.82	79.64	91.18
26	99.82	111.00	0.00	0.00	111.00	173.15	82.82	90.33
27	97.37	108.27	0.00	0.00	108.27	175.40	86.01	89.39
85	43.39	48.25	0.00	0.00	48.25	246.10	270.77	0.00
90	41.60	46.26	0.00	0.00	46.26	249.80	286.70	0.00
100	38.47	42.78	0.00	0.00	42.78	256.70	318.55	0.00
105	37.10	41.26	0.00	0.00	41.26	259.92	334.48	0.00
110	35.84	39.85	0.00	0.00	39.85	263.01	350.41	0.00
115	34.66	38.55	0.00	0.00	38.55	265.98	366.34	0.00
120	33.58	37.34	0.00	0.00	37.34	268.84	382.26	0.00
125	32.57	36.21	0.00	0.00	36.21	271.59	398.19	0.00
130	31.62	35.16	0.00	0.00	35.16	274.26	414.12	0.00
135	30.73	34.18	0.00	0.00	34.18	276.83	430.05	0.00
140	29.90	33.25	0.00	0.00	33.25	279.33	445.97	0.00

Required Storage (m^3):	**94.10**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 214

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.340
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	44.83
	Actual Release Rate (l/s) =	44.83
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	132.98	0.00	0.00	132.98	119.68	40.35	79.34
16	135.41	127.99	0.00	0.00	127.99	122.87	43.04	79.84
17	130.56	123.41	0.00	0.00	123.41	125.88	45.72	80.15
18	126.09	119.18	0.00	0.00	119.18	128.72	48.41	80.30
19	121.96	115.28	0.00	0.00	115.28	131.42	51.10	80.31
20	118.12	111.65	0.00	0.00	111.65	133.98	53.79	80.19
21	114.55	108.27	0.00	0.00	108.27	136.42	56.48	79.94
22	111.21	105.12	0.00	0.00	105.12	138.76	59.17	79.58
23	108.09	102.17	0.00	0.00	102.17	140.99	61.86	79.13
24	105.16	99.40	0.00	0.00	99.40	143.14	64.55	78.58
25	102.41	96.80	0.00	0.00	96.80	145.20	67.24	77.96
26	99.82	94.35	0.00	0.00	94.35	147.18	69.93	77.25
27	97.37	92.03	0.00	0.00	92.03	149.09	72.62	76.47
85	43.39	41.02	0.00	0.00	41.02	209.18	228.62	0.00
90	41.60	39.32	0.00	0.00	39.32	212.33	242.07	0.00
100	38.47	36.37	0.00	0.00	36.37	218.19	268.97	0.00
105	37.10	35.07	0.00	0.00	35.07	220.93	282.42	0.00
110	35.84	33.87	0.00	0.00	33.87	223.56	295.87	0.00
115	34.66	32.77	0.00	0.00	32.77	226.08	309.32	0.00
120	33.58	31.74	0.00	0.00	31.74	228.51	322.76	0.00
125	32.57	30.78	0.00	0.00	30.78	230.85	336.21	0.00
130	31.62	29.89	0.00	0.00	29.89	233.12	349.66	0.00
135	30.73	29.05	0.00	0.00	29.05	235.31	363.11	0.00
140	29.90	28.27	0.00	0.00	28.27	237.43	376.56	0.00

Required Storage (m^3):	**80.31**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 215

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.820
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	110.94
	Actual Release Rate (l/s) =	110.94
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	320.72	0.00	0.00	320.72	288.64	99.84	188.80
16	135.41	308.68	0.00	0.00	308.68	296.34	106.50	189.83
17	130.56	297.63	0.00	0.00	297.63	303.59	113.16	190.43
18	126.09	287.45	0.00	0.00	287.45	310.44	119.81	190.63
19	121.96	278.02	0.00	0.00	278.02	316.94	126.47	190.47
20	118.12	269.27	0.00	0.00	269.27	323.13	133.13	190.00
21	114.55	261.13	0.00	0.00	261.13	329.02	139.78	189.24
22	111.21	253.52	0.00	0.00	253.52	334.65	146.44	188.21
23	108.09	246.41	0.00	0.00	246.41	340.04	153.10	186.95
24	105.16	239.73	0.00	0.00	239.73	345.21	159.75	185.46
25	102.41	233.45	0.00	0.00	233.45	350.18	166.41	183.77
26	99.82	227.54	0.00	0.00	227.54	354.96	173.06	181.90
27	97.37	221.96	0.00	0.00	221.96	359.57	179.72	179.85
85	43.39	98.92	0.00	0.00	98.92	504.50	565.79	0.00
90	41.60	94.83	0.00	0.00	94.83	512.10	599.07	0.00
100	38.47	87.70	0.00	0.00	87.70	526.23	665.63	0.00
105	37.10	84.58	0.00	0.00	84.58	532.83	698.91	0.00
110	35.84	81.69	0.00	0.00	81.69	539.16	732.20	0.00
115	34.66	79.02	0.00	0.00	79.02	545.25	765.48	0.00
120	33.58	76.54	0.00	0.00	76.54	551.11	798.76	0.00
125	32.57	74.24	0.00	0.00	74.24	556.77	832.04	0.00
130	31.62	72.08	0.00	0.00	72.08	562.23	865.32	0.00
135	30.73	70.06	0.00	0.00	70.06	567.51	898.60	0.00
140	29.90	68.17	0.00	0.00	68.17	572.63	931.89	0.00

Required Storage (m^3):	**190.63**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 216

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.190
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	24.17
	Actual Release Rate (l/s) =	24.17
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	74.31	0.00	0.00	74.31	66.88	21.75	45.13
16	135.41	71.52	0.00	0.00	71.52	68.66	23.20	45.46
17	130.56	68.96	0.00	0.00	68.96	70.34	24.65	45.69
18	126.09	66.60	0.00	0.00	66.60	71.93	26.10	45.83
19	121.96	64.42	0.00	0.00	64.42	73.44	27.55	45.89
20	118.12	62.39	0.00	0.00	62.39	74.87	29.00	45.87
21	114.55	60.51	0.00	0.00	60.51	76.24	30.45	45.78
22	111.21	58.74	0.00	0.00	58.74	77.54	31.90	45.64
23	108.09	57.09	0.00	0.00	57.09	78.79	33.35	45.44
24	105.16	55.55	0.00	0.00	55.55	79.99	34.80	45.19
25	102.41	54.09	0.00	0.00	54.09	81.14	36.25	44.89
26	99.82	52.72	0.00	0.00	52.72	82.25	37.70	44.54
27	97.37	51.43	0.00	0.00	51.43	83.32	39.15	44.16
85	43.39	22.92	0.00	0.00	22.92	116.90	123.26	0.00
90	41.60	21.97	0.00	0.00	21.97	118.66	130.51	0.00
100	38.47	20.32	0.00	0.00	20.32	121.93	145.01	0.00
105	37.10	19.60	0.00	0.00	19.60	123.46	152.26	0.00
110	35.84	18.93	0.00	0.00	18.93	124.93	159.51	0.00
115	34.66	18.31	0.00	0.00	18.31	126.34	166.76	0.00
120	33.58	17.74	0.00	0.00	17.74	127.70	174.01	0.00
125	32.57	17.20	0.00	0.00	17.20	129.01	181.27	0.00
130	31.62	16.70	0.00	0.00	16.70	130.27	188.52	0.00
135	30.73	16.23	0.00	0.00	16.23	131.50	195.77	0.00
140	29.90	15.80	0.00	0.00	15.80	132.68	203.02	0.00

Required Storage (m^3):	**45.89**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 217

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.360
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	47.58
	Actual Release Rate (l/s) =	47.58
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	140.80	0.00	0.00	140.80	126.72	42.82	83.90
16	135.41	135.52	0.00	0.00	135.52	130.10	45.68	84.42
17	130.56	130.67	0.00	0.00	130.67	133.28	48.53	84.75
18	126.09	126.20	0.00	0.00	126.20	136.29	51.39	84.90
19	121.96	122.06	0.00	0.00	122.06	139.15	54.24	84.90
20	118.12	118.22	0.00	0.00	118.22	141.86	57.10	84.76
21	114.55	114.64	0.00	0.00	114.64	144.45	59.95	84.49
22	111.21	111.30	0.00	0.00	111.30	146.92	62.81	84.11
23	108.09	108.18	0.00	0.00	108.18	149.29	65.66	83.62
24	105.16	105.25	0.00	0.00	105.25	151.56	68.52	83.04
25	102.41	102.49	0.00	0.00	102.49	153.74	71.37	82.36
26	99.82	99.90	0.00	0.00	99.90	155.84	74.23	81.61
27	97.37	97.44	0.00	0.00	97.44	157.86	77.08	80.78
85	43.39	43.43	0.00	0.00	43.43	221.49	242.67	0.00
90	41.60	41.63	0.00	0.00	41.63	224.82	256.95	0.00
100	38.47	38.50	0.00	0.00	38.50	231.03	285.50	0.00
105	37.10	37.13	0.00	0.00	37.13	233.93	299.77	0.00
110	35.84	35.86	0.00	0.00	35.86	236.71	314.05	0.00
115	34.66	34.69	0.00	0.00	34.69	239.38	328.32	0.00
120	33.58	33.60	0.00	0.00	33.60	241.95	342.60	0.00
125	32.57	32.59	0.00	0.00	32.59	244.43	356.87	0.00
130	31.62	31.65	0.00	0.00	31.65	246.83	371.15	0.00
135	30.73	30.76	0.00	0.00	30.76	249.15	385.42	0.00
140	29.90	29.93	0.00	0.00	29.93	251.40	399.70	0.00

Required Storage (m^3):	**84.90**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 218

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.580
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	77.88
	Actual Release Rate (l/s) =	77.88
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	226.85	0.00	0.00	226.85	204.16	70.10	134.07
16	135.41	218.34	0.00	0.00	218.34	209.60	74.77	134.84
17	130.56	210.52	0.00	0.00	210.52	214.73	79.44	135.29
18	126.09	203.31	0.00	0.00	203.31	219.58	84.11	135.47
19	121.96	196.65	0.00	0.00	196.65	224.18	88.79	135.39
20	118.12	190.46	0.00	0.00	190.46	228.55	93.46	135.09
21	114.55	184.70	0.00	0.00	184.70	232.72	98.13	134.59
22	111.21	179.32	0.00	0.00	179.32	236.71	102.81	133.90
23	108.09	174.29	0.00	0.00	174.29	240.52	107.48	133.04
24	105.16	169.57	0.00	0.00	169.57	244.18	112.15	132.02
25	102.41	165.13	0.00	0.00	165.13	247.69	116.83	130.86
26	99.82	160.94	0.00	0.00	160.94	251.07	121.50	129.57
27	97.37	156.99	0.00	0.00	156.99	254.33	126.17	128.16
85	43.39	69.97	0.00	0.00	69.97	356.84	397.21	0.00
90	41.60	67.08	0.00	0.00	67.08	362.22	420.57	0.00
100	38.47	62.03	0.00	0.00	62.03	372.21	467.30	0.00
105	37.10	59.82	0.00	0.00	59.82	376.88	490.67	0.00
110	35.84	57.78	0.00	0.00	57.78	381.36	514.03	0.00
115	34.66	55.89	0.00	0.00	55.89	385.67	537.40	0.00
120	33.58	54.14	0.00	0.00	54.14	389.81	560.76	0.00
125	32.57	52.51	0.00	0.00	52.51	393.81	584.13	0.00
130	31.62	50.98	0.00	0.00	50.98	397.67	607.49	0.00
135	30.73	49.56	0.00	0.00	49.56	401.41	630.86	0.00
140	29.90	48.22	0.00	0.00	48.22	405.03	654.22	0.00

Required Storage (m^3):	**135.47**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 219

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.570
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	76.51
	Actual Release Rate (l/s) =	76.51
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	222.94	0.00	0.00	222.94	200.64	68.86	131.79
16	135.41	214.57	0.00	0.00	214.57	205.99	73.45	132.54
17	130.56	206.89	0.00	0.00	206.89	211.03	78.04	132.99
18	126.09	199.81	0.00	0.00	199.81	215.79	82.63	133.17
19	121.96	193.26	0.00	0.00	193.26	220.31	87.22	133.10
20	118.12	187.18	0.00	0.00	187.18	224.61	91.81	132.80
21	114.55	181.52	0.00	0.00	181.52	228.71	96.40	132.31
22	111.21	176.23	0.00	0.00	176.23	232.62	100.99	131.64
23	108.09	171.28	0.00	0.00	171.28	236.37	105.58	130.79
24	105.16	166.64	0.00	0.00	166.64	239.97	110.17	129.80
25	102.41	162.28	0.00	0.00	162.28	243.42	114.76	128.66
26	99.82	158.17	0.00	0.00	158.17	246.74	119.35	127.39
27	97.37	154.29	0.00	0.00	154.29	249.95	123.94	126.01
85	43.39	68.76	0.00	0.00	68.76	350.69	390.18	0.00
90	41.60	65.92	0.00	0.00	65.92	355.97	413.13	0.00
100	38.47	60.97	0.00	0.00	60.97	365.79	459.04	0.00
105	37.10	58.79	0.00	0.00	58.79	370.38	481.99	0.00
110	35.84	56.79	0.00	0.00	56.79	374.78	504.94	0.00
115	34.66	54.93	0.00	0.00	54.93	379.02	527.89	0.00
120	33.58	53.21	0.00	0.00	53.21	383.09	550.84	0.00
125	32.57	51.60	0.00	0.00	51.60	387.02	573.80	0.00
130	31.62	50.10	0.00	0.00	50.10	390.82	596.75	0.00
135	30.73	48.70	0.00	0.00	48.70	394.49	619.70	0.00
140	29.90	47.39	0.00	0.00	47.39	398.05	642.65	0.00

Required Storage (m^3):	**133.17**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 220

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	1.00
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	135.73
	Actual Release Rate (l/s) =	135.73
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	391.12	0.00	0.00	391.12	352.01	122.16	229.85
16	135.41	376.44	0.00	0.00	376.44	361.38	130.30	231.08
17	130.56	362.97	0.00	0.00	362.97	370.23	138.44	231.78
18	126.09	350.54	0.00	0.00	350.54	378.59	146.59	232.00
19	121.96	339.05	0.00	0.00	339.05	386.52	154.73	231.78
20	118.12	328.38	0.00	0.00	328.38	394.06	162.88	231.18
21	114.55	318.45	0.00	0.00	318.45	401.24	171.02	230.22
22	111.21	309.18	0.00	0.00	309.18	408.11	179.16	228.95
23	108.09	300.50	0.00	0.00	300.50	414.69	187.31	227.38
24	105.16	292.36	0.00	0.00	292.36	420.99	195.45	225.54
25	102.41	284.70	0.00	0.00	284.70	427.05	203.60	223.46
26	99.82	277.49	0.00	0.00	277.49	432.88	211.74	221.14
27	97.37	270.68	0.00	0.00	270.68	438.50	219.88	218.62
85	43.39	120.64	0.00	0.00	120.64	615.25	692.22	0.00
90	41.60	115.65	0.00	0.00	115.65	624.51	732.94	0.00
100	38.47	106.96	0.00	0.00	106.96	641.74	814.38	0.00
105	37.10	103.14	0.00	0.00	103.14	649.79	855.10	0.00
110	35.84	99.62	0.00	0.00	99.62	657.52	895.82	0.00
115	34.66	96.37	0.00	0.00	96.37	664.94	936.54	0.00
120	33.58	93.35	0.00	0.00	93.35	672.09	977.26	0.00
125	32.57	90.53	0.00	0.00	90.53	678.98	1017.98	0.00
130	31.62	87.90	0.00	0.00	87.90	685.64	1058.70	0.00
135	30.73	85.44	0.00	0.00	85.44	692.09	1099.41	0.00
140	29.90	83.13	0.00	0.00	83.13	698.33	1140.13	0.00

Required Storage (m^3):	**232.00**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 221

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	1.300
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	177.05
	Actual Release Rate (l/s) =	177.05
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	508.45	0.00	0.00	508.45	457.61	159.34	298.26
16	135.41	489.38	0.00	0.00	489.38	469.80	169.97	299.83
17	130.56	471.86	0.00	0.00	471.86	481.29	180.59	300.70
18	126.09	455.71	0.00	0.00	455.71	492.16	191.21	300.95
19	121.96	440.76	0.00	0.00	440.76	502.47	201.84	300.63
20	118.12	426.89	0.00	0.00	426.89	512.27	212.46	299.81
21	114.55	413.98	0.00	0.00	413.98	521.62	223.08	298.54
22	111.21	401.93	0.00	0.00	401.93	530.55	233.71	296.84
23	108.09	390.65	0.00	0.00	390.65	539.09	244.33	294.77
24	105.16	380.06	0.00	0.00	380.06	547.29	254.95	292.34
25	102.41	370.11	0.00	0.00	370.11	555.17	265.57	289.59
26	99.82	360.74	0.00	0.00	360.74	562.75	276.20	286.55
27	97.37	351.88	0.00	0.00	351.88	570.05	286.82	283.23
85	43.39	156.83	0.00	0.00	156.83	799.82	902.95	0.00
90	41.60	150.34	0.00	0.00	150.34	811.86	956.07	0.00
100	38.47	139.04	0.00	0.00	139.04	834.26	1062.30	0.00
105	37.10	134.08	0.00	0.00	134.08	844.73	1115.41	0.00
110	35.84	129.51	0.00	0.00	129.51	854.77	1168.53	0.00
115	34.66	125.28	0.00	0.00	125.28	864.42	1221.64	0.00
120	33.58	121.35	0.00	0.00	121.35	873.72	1274.75	0.00
125	32.57	117.69	0.00	0.00	117.69	882.68	1327.87	0.00
130	31.62	114.27	0.00	0.00	114.27	891.34	1380.98	0.00
135	30.73	111.08	0.00	0.00	111.08	899.71	1434.10	0.00
140	29.90	108.07	0.00	0.00	108.07	907.82	1487.21	0.00

Required Storage (m^3):	**300.95**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 222

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.740
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	99.92
	Actual Release Rate (l/s) =	99.92
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	289.43	0.00	0.00	289.43	260.48	89.93	170.56
16	135.41	278.57	0.00	0.00	278.57	267.42	95.92	171.50
17	130.56	268.60	0.00	0.00	268.60	273.97	101.92	172.05
18	126.09	259.40	0.00	0.00	259.40	280.15	107.91	172.24
19	121.96	250.90	0.00	0.00	250.90	286.02	113.91	172.11
20	118.12	243.00	0.00	0.00	243.00	291.60	119.90	171.70
21	114.55	235.65	0.00	0.00	235.65	296.92	125.90	171.02
22	111.21	228.79	0.00	0.00	228.79	302.00	131.89	170.11
23	108.09	222.37	0.00	0.00	222.37	306.87	137.89	168.98
24	105.16	216.34	0.00	0.00	216.34	311.53	143.89	167.65
25	102.41	210.68	0.00	0.00	210.68	316.02	149.88	166.14
26	99.82	205.34	0.00	0.00	205.34	320.33	155.88	164.46
27	97.37	200.30	0.00	0.00	200.30	324.49	161.87	162.62
85	43.39	89.27	0.00	0.00	89.27	455.28	509.59	0.00
90	41.60	85.58	0.00	0.00	85.58	462.14	539.57	0.00
100	38.47	79.15	0.00	0.00	79.15	474.89	599.52	0.00
105	37.10	76.32	0.00	0.00	76.32	480.85	629.50	0.00
110	35.84	73.72	0.00	0.00	73.72	486.56	659.47	0.00
115	34.66	71.31	0.00	0.00	71.31	492.06	689.45	0.00
120	33.58	69.08	0.00	0.00	69.08	497.35	719.43	0.00
125	32.57	66.99	0.00	0.00	66.99	502.45	749.40	0.00
130	31.62	65.05	0.00	0.00	65.05	507.38	779.38	0.00
135	30.73	63.23	0.00	0.00	63.23	512.14	809.35	0.00
140	29.90	61.52	0.00	0.00	61.52	516.76	839.33	0.00

Required Storage (m^3):	**172.24**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 223

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.820
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	110.94
	Actual Release Rate (l/s) =	110.94
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	320.72	0.00	0.00	320.72	288.64	99.84	188.80
16	135.41	308.68	0.00	0.00	308.68	296.34	106.50	189.83
17	130.56	297.63	0.00	0.00	297.63	303.59	113.16	190.43
18	126.09	287.45	0.00	0.00	287.45	310.44	119.81	190.63
19	121.96	278.02	0.00	0.00	278.02	316.94	126.47	190.47
20	118.12	269.27	0.00	0.00	269.27	323.13	133.13	190.00
21	114.55	261.13	0.00	0.00	261.13	329.02	139.78	189.24
22	111.21	253.52	0.00	0.00	253.52	334.65	146.44	188.21
23	108.09	246.41	0.00	0.00	246.41	340.04	153.10	186.95
24	105.16	239.73	0.00	0.00	239.73	345.21	159.75	185.46
25	102.41	233.45	0.00	0.00	233.45	350.18	166.41	183.77
26	99.82	227.54	0.00	0.00	227.54	354.96	173.06	181.90
27	97.37	221.96	0.00	0.00	221.96	359.57	179.72	179.85
85	43.39	98.92	0.00	0.00	98.92	504.50	565.79	0.00
90	41.60	94.83	0.00	0.00	94.83	512.10	599.07	0.00
100	38.47	87.70	0.00	0.00	87.70	526.23	665.63	0.00
105	37.10	84.58	0.00	0.00	84.58	532.83	698.91	0.00
110	35.84	81.69	0.00	0.00	81.69	539.16	732.20	0.00
115	34.66	79.02	0.00	0.00	79.02	545.25	765.48	0.00
120	33.58	76.54	0.00	0.00	76.54	551.11	798.76	0.00
125	32.57	74.24	0.00	0.00	74.24	556.77	832.04	0.00
130	31.62	72.08	0.00	0.00	72.08	562.23	865.32	0.00
135	30.73	70.06	0.00	0.00	70.06	567.51	898.60	0.00
140	29.90	68.17	0.00	0.00	68.17	572.63	931.89	0.00

Required Storage (m^3):	**190.63**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 224

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.460
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	61.36
	Actual Release Rate (l/s) =	61.36
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	179.91	0.00	0.00	179.91	161.92	55.22	106.70
16	135.41	173.16	0.00	0.00	173.16	166.24	58.90	107.34
17	130.56	166.96	0.00	0.00	166.96	170.30	62.58	107.72
18	126.09	161.25	0.00	0.00	161.25	174.15	66.26	107.89
19	121.96	155.96	0.00	0.00	155.96	177.80	69.95	107.85
20	118.12	151.06	0.00	0.00	151.06	181.27	73.63	107.64
21	114.55	146.49	0.00	0.00	146.49	184.57	77.31	107.26
22	111.21	142.22	0.00	0.00	142.22	187.73	80.99	106.74
23	108.09	138.23	0.00	0.00	138.23	190.76	84.67	106.08
24	105.16	134.48	0.00	0.00	134.48	193.66	88.35	105.30
25	102.41	130.96	0.00	0.00	130.96	196.44	92.03	104.41
26	99.82	127.64	0.00	0.00	127.64	199.13	95.72	103.41
27	97.37	124.51	0.00	0.00	124.51	201.71	99.40	102.31
85	43.39	55.49	0.00	0.00	55.49	283.01	312.92	0.00
90	41.60	53.20	0.00	0.00	53.20	287.27	331.32	0.00
100	38.47	49.20	0.00	0.00	49.20	295.20	368.14	0.00
105	37.10	47.45	0.00	0.00	47.45	298.90	386.54	0.00
110	35.84	45.83	0.00	0.00	45.83	302.46	404.95	0.00
115	34.66	44.33	0.00	0.00	44.33	305.87	423.36	0.00
120	33.58	42.94	0.00	0.00	42.94	309.16	441.76	0.00
125	32.57	41.64	0.00	0.00	41.64	312.33	460.17	0.00
130	31.62	40.44	0.00	0.00	40.44	315.40	478.58	0.00
135	30.73	39.30	0.00	0.00	39.30	318.36	496.98	0.00
140	29.90	38.24	0.00	0.00	38.24	321.23	515.39	0.00

Required Storage (m^3):	**107.89**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 225

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.380
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	50.34
	Actual Release Rate (l/s) =	50.34
External Area	Area (ha) =	0.00
	C =	0.00
External Flows		

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	148.62	0.00	0.00	148.62	133.76	45.30	88.46
16	135.41	143.05	0.00	0.00	143.05	137.33	48.32	89.00
17	130.56	137.93	0.00	0.00	137.93	140.69	51.34	89.34
18	126.09	133.21	0.00	0.00	133.21	143.86	54.36	89.50
19	121.96	128.84	0.00	0.00	128.84	146.88	57.38	89.49
20	118.12	124.78	0.00	0.00	124.78	149.74	60.40	89.34
21	114.55	121.01	0.00	0.00	121.01	152.47	63.43	89.05
22	111.21	117.49	0.00	0.00	117.49	155.08	66.45	88.64
23	108.09	114.19	0.00	0.00	114.19	157.58	69.47	88.12
24	105.16	111.10	0.00	0.00	111.10	159.98	72.49	87.49
25	102.41	108.19	0.00	0.00	108.19	162.28	75.51	86.77
26	99.82	105.45	0.00	0.00	105.45	164.50	78.53	85.97
27	97.37	102.86	0.00	0.00	102.86	166.63	81.55	85.08
85	43.39	45.84	0.00	0.00	45.84	233.79	256.72	0.00
90	41.60	43.95	0.00	0.00	43.95	237.31	271.82	0.00
100	38.47	40.64	0.00	0.00	40.64	243.86	302.02	0.00
105	37.10	39.19	0.00	0.00	39.19	246.92	317.13	0.00
110	35.84	37.86	0.00	0.00	37.86	249.86	332.23	0.00
115	34.66	36.62	0.00	0.00	36.62	252.68	347.33	0.00
120	33.58	35.47	0.00	0.00	35.47	255.39	362.43	0.00
125	32.57	34.40	0.00	0.00	34.40	258.01	377.53	0.00
130	31.62	33.40	0.00	0.00	33.40	260.54	392.63	0.00
135	30.73	32.47	0.00	0.00	32.47	262.99	407.73	0.00
140	29.90	31.59	0.00	0.00	31.59	265.36	422.83	0.00

Required Storage (m^3):	**89.50**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 226

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.610
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	82.02
	Actual Release Rate (l/s) =	82.02
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	238.58	0.00	0.00	238.58	214.72	73.81	140.91
16	135.41	229.63	0.00	0.00	229.63	220.44	78.73	141.71
17	130.56	221.41	0.00	0.00	221.41	225.84	83.66	142.18
18	126.09	213.83	0.00	0.00	213.83	230.94	88.58	142.36
19	121.96	206.82	0.00	0.00	206.82	235.77	93.50	142.28
20	118.12	200.31	0.00	0.00	200.31	240.37	98.42	141.96
21	114.55	194.25	0.00	0.00	194.25	244.76	103.34	141.42
22	111.21	188.60	0.00	0.00	188.60	248.95	108.26	140.69
23	108.09	183.30	0.00	0.00	183.30	252.96	113.18	139.78
24	105.16	178.34	0.00	0.00	178.34	256.81	118.10	138.70
25	102.41	173.67	0.00	0.00	173.67	260.50	123.02	137.48
26	99.82	169.27	0.00	0.00	169.27	264.06	127.94	136.11
27	97.37	165.11	0.00	0.00	165.11	267.49	132.86	134.62
85	43.39	73.59	0.00	0.00	73.59	375.30	418.28	0.00
90	41.60	70.55	0.00	0.00	70.55	380.95	442.88	0.00
100	38.47	65.24	0.00	0.00	65.24	391.46	492.09	0.00
105	37.10	62.92	0.00	0.00	62.92	396.37	516.70	0.00
110	35.84	60.77	0.00	0.00	60.77	401.09	541.30	0.00
115	34.66	58.78	0.00	0.00	58.78	405.61	565.91	0.00
120	33.58	56.94	0.00	0.00	56.94	409.97	590.51	0.00
125	32.57	55.22	0.00	0.00	55.22	414.18	615.12	0.00
130	31.62	53.62	0.00	0.00	53.62	418.24	639.72	0.00
135	30.73	52.12	0.00	0.00	52.12	422.17	664.32	0.00
140	29.90	50.71	0.00	0.00	50.71	425.98	688.93	0.00

Required Storage (m^3):	**142.36**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 227

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.320
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	42.07
	Actual Release Rate (l/s) =	42.07
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	125.16	0.00	0.00	125.16	112.64	37.87	74.78
16	135.41	120.46	0.00	0.00	120.46	115.64	40.39	75.25
17	130.56	116.15	0.00	0.00	116.15	118.47	42.92	75.56
18	126.09	112.17	0.00	0.00	112.17	121.15	45.44	75.71
19	121.96	108.50	0.00	0.00	108.50	123.69	47.96	75.72
20	118.12	105.08	0.00	0.00	105.08	126.10	50.49	75.61
21	114.55	101.90	0.00	0.00	101.90	128.40	53.01	75.39
22	111.21	98.94	0.00	0.00	98.94	130.60	55.54	75.06
23	108.09	96.16	0.00	0.00	96.16	132.70	58.06	74.64
24	105.16	93.55	0.00	0.00	93.55	134.72	60.59	74.13
25	102.41	91.10	0.00	0.00	91.10	136.66	63.11	73.55
26	99.82	88.80	0.00	0.00	88.80	138.52	65.63	72.89
27	97.37	86.62	0.00	0.00	86.62	140.32	68.16	72.16
85	43.39	38.60	0.00	0.00	38.60	196.88	214.58	0.00
90	41.60	37.01	0.00	0.00	37.01	199.84	227.20	0.00
100	38.47	34.23	0.00	0.00	34.23	205.36	252.44	0.00
105	37.10	33.01	0.00	0.00	33.01	207.93	265.06	0.00
110	35.84	31.88	0.00	0.00	31.88	210.41	277.69	0.00
115	34.66	30.84	0.00	0.00	30.84	212.78	290.31	0.00
120	33.58	29.87	0.00	0.00	29.87	215.07	302.93	0.00
125	32.57	28.97	0.00	0.00	28.97	217.27	315.55	0.00
130	31.62	28.13	0.00	0.00	28.13	219.41	328.17	0.00
135	30.73	27.34	0.00	0.00	27.34	221.47	340.80	0.00
140	29.90	26.60	0.00	0.00	26.60	223.46	353.42	0.00

Required Storage (m^3):	**75.72**
Provided Storage (m^3):	

Storage Volume Calculation

Project: 4938 Catchment 228

SCHAEFFERS CONSULTING ENGINEERS

Modified Rational Method

Internal Area	Controlled Drainage Area (ha) =	0.350
	5-year C =	0.90
	100-year C =	1.00
	Allocated Release Rate (l/s) =	46.21
	Actual Release Rate (l/s) =	46.21
External Area	Area (ha) =	0.00
	C =	0.00
Groundwater	Groundwater pumping rate =	0.00 L/s

100 Year Storm

Design Storm =	Mississauga
A =	1450
B =	4.9
C =	0.78

	100 Year					Total	Maximum	Required
Time	Intensity	Total	Groundwater	External	Total	Runoff	Release	Storage
(min)	100 year	Runoff	Flows	Runoff	Runoff	Volume	Volume	Volume
	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(m^3)	(m^3)	(m^3)
15	140.69	136.89	0.00	0.00	136.89	123.20	41.59	81.62
16	135.41	131.75	0.00	0.00	131.75	126.48	44.36	82.13
17	130.56	127.04	0.00	0.00	127.04	129.58	47.13	82.45
18	126.09	122.69	0.00	0.00	122.69	132.51	49.90	82.60
19	121.96	118.67	0.00	0.00	118.67	135.28	52.67	82.61
20	118.12	114.93	0.00	0.00	114.93	137.92	55.45	82.47
21	114.55	111.46	0.00	0.00	111.46	140.44	58.22	82.22
22	111.21	108.21	0.00	0.00	108.21	142.84	60.99	81.85
23	108.09	105.17	0.00	0.00	105.17	145.14	63.76	81.38
24	105.16	102.32	0.00	0.00	102.32	147.35	66.54	80.81
25	102.41	99.65	0.00	0.00	99.65	149.47	69.31	80.16
26	99.82	97.12	0.00	0.00	97.12	151.51	72.08	79.43
27	97.37	94.74	0.00	0.00	94.74	153.48	74.85	78.62
85	43.39	42.22	0.00	0.00	42.22	215.34	235.65	0.00
90	41.60	40.48	0.00	0.00	40.48	218.58	249.51	0.00
100	38.47	37.43	0.00	0.00	37.43	224.61	277.23	0.00
105	37.10	36.10	0.00	0.00	36.10	227.43	291.10	0.00
110	35.84	34.87	0.00	0.00	34.87	230.13	304.96	0.00
115	34.66	33.73	0.00	0.00	33.73	232.73	318.82	0.00
120	33.58	32.67	0.00	0.00	32.67	235.23	332.68	0.00
125	32.57	31.69	0.00	0.00	31.69	237.64	346.54	0.00
130	31.62	30.77	0.00	0.00	30.77	239.98	360.40	0.00
135	30.73	29.90	0.00	0.00	29.90	242.23	374.27	0.00
140	29.90	29.10	0.00	0.00	29.10	244.41	388.13	0.00

Required Storage (m^3):	**82.61**
Provided Storage (m^3):	

Project 4938 Rangeview Estates Development
Right of Way and Park SWM Requirements Summary

SCHAEFFERS
CONSULTING ENGINEERS

Rainfall intensity

Rainfall Intensity-City of Mississauga

Design Storm Event	A	B	C	I (mm/hr)
2-Year	610.0	4.6	0.78	59.9
5-Year	820.0	4.6	0.78	80.5
10-Year	1010.0	4.6	0.78	99.2
25-Year	1160.0	4.6	0.78	113.9
50-Year	1300.0	4.7	0.78	127.1
100-Year	1450.0	4.9	0.780	140.7

Tc= 15 minutes

I=A/((T+B)^C)

Description	Catchment #	Area (ha)	Runoff coefficent	10-year minor flows (L/s)	100-year flows (L/s)	Volumetric Requirement (m3)*	LID Refrence ID**
Park	300	0.24	0.30	19.83	28.14	-	-
Park	301	0.33	0.30	27.27	38.69	-	-
Park	302	0.26	0.30	21.49	30.48	-	-
Park	303	0.62	0.30	51.24	72.69	-	-
Park	304	0.16	0.30	13.22	18.76	-	-
Park	305	0.35	0.30	28.92	41.03	-	-
Park	306	0.16	0.30	13.22	18.76	-	-
Park	307	0.29	0.30	23.97	34.00	-	-
Park	308	0.26	0.30	21.49	30.48	-	-
Municipal ROW	401	0.20	0.90	49.58	70.34	10.00	1
Municipal ROW	402	0.19	0.90	47.10	66.83	9.50	
Municipal ROW	403	0.18	0.90	44.62	63.31	9.00	
Municipal ROW	404	0.71	0.90	176.02	249.72	35.50	2
Municipal ROW	405	0.82	0.90	203.29	288.41	41.00	3
Municipal ROW	406	0.23	0.90	57.02	80.90	11.50	4
Municipal ROW	407	0.27	0.90	66.94	94.97	13.50	5
Municipal ROW	408	0.29	0.90	71.90	102.00	14.50	6
Municipal ROW	409	0.52	0.90	128.92	182.90	26.00	7
Municipal ROW	410	0.61	0.90	151.23	214.55	30.50	8
Municipal ROW	411	0.18	0.90	44.62	63.31	9.00	9
Municipal ROW	412	0.16	0.90	39.67	56.28	8.00	10
Municipal ROW	413	0.32	0.90	79.33	112.55	16.00	11
Municipal ROW	414	0.44	0.90	109.08	154.76	22.00	12
Municipal ROW	415	0.50	0.90	123.96	175.86	25.00	13
Municipal ROW	416	0.21	0.90	52.06	73.86	10.50	-
Municipal ROW	417	0.21	0.90	52.06	73.86	10.50	-
Municipal ROW	418	0.34	0.90	84.29	119.59	17.00	-
Municipal ROW	419	0.15	0.90	37.19	52.76	7.50	14

* Volumetric Requirement =Area x TIMP x 5mm x 10

**Refer to LID Figure Location and Volume Requirements

Project# 4938

Rangeview Estates

West of Lakefront Promenade Cumulative Requirements
WATER QUALITY REQUIREMENT CALCULATIONS

Table: Water Quality Storage Requirements Based on Receiving Waters

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level					
		0%	35%	55%	70%	85%	100%
Level 3	Infiltration/Filtration	20	20	20	20	20	20

Input:

Estimated Imperviousness =	100%	
Total ROW Area =	2.10	ha
Level of Protection:	3	
SWMP Type :	nfiltration/Filtration	

Calculation:

Total Filter Volume Required = 20 m^3/ha → **42**

5mm Retention Requirement= 105 m^3

Use LID Sizing Greater of 5mm retention or volume required for 60% TSS removal filtration

Calculation are subject to change based on final grading, servicing and full capture points

Given 5mm Retention requirement is higher than quality, quality control is satisfied (Tree Pits are sized for 5mm)

Project# 4938

Rangeview Estates

East of Lakefront Promenade Treepit Cumulative Requirements
WATER QUALITY REQUIREMENT CALCULATIONS

Table: Water Quality Storage Requirements Based on Receiving Waters

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level					
		0%	35%	55%	70%	85%	100%
Level 3	Infiltration/Filtration	20	20	20	20	20	20

Input:

Estimated Imperviousness =	100%	
Total ROW Area =	3.49	ha
Level of Protection:	3	
SWMP Type :	Infiltration/Filtration	

Calculation:

Total Filter Volume Required = 20 m^3/ha → **70**

5mm Retention Requirement= 175 m^3

Use LID Sizing Greater of 5mm retention or volume required for 60% TSS removal filtration

Calculation are subject to change based on final grading, servicing and full capture points

Given 5mm Retention requirement is higher than quality, quality control is satisfied (Tree Pits are sized for 5mm)

Project# 4938

Rangeview Estates

Lakefront Promenade Cumulative Treepit Requirements
WATER QUALITY REQUIREMENT CALCULATIONS

Table: Water Quality Storage Requirements Based on Receiving Waters

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level					
		0%	35%	55%	70%	85%	100%
Level 1	Infiltration/Filtration	53	25	30	35	40	45

Input:

Estimated Imperviousness =	100%	
Total ROW Area =	0.79	ha
Level of Protection:	1	
SWMP Type :	Infiltration/Filtration	

Calculation:

Total Filter Volume Required = 45 m^3/ha → **36**

5mm Retention Requirement= 40 m^3

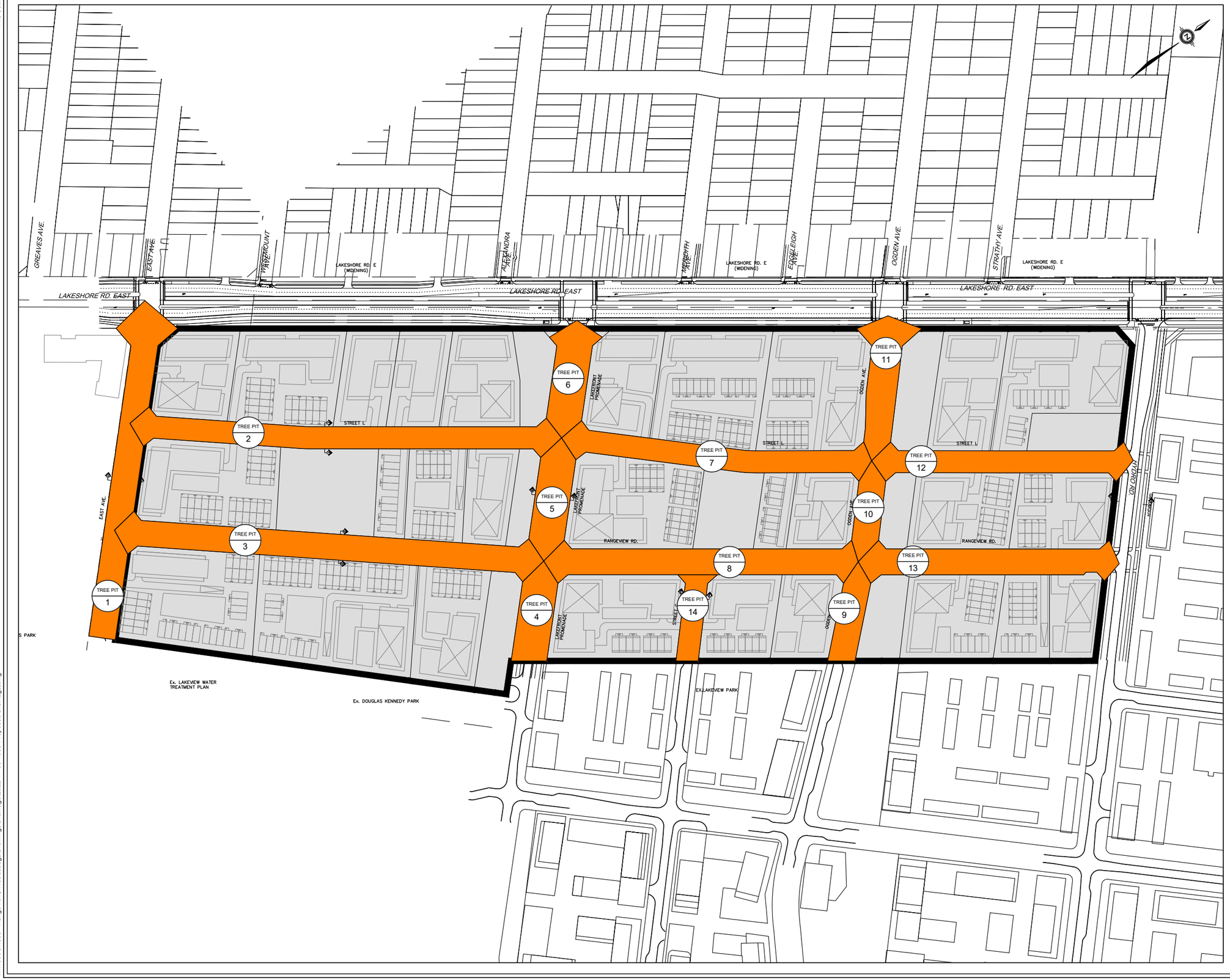
Use LID Sizing Greater of 5mm retention or volume required for 80% TSS removal filtration

Calculation are subject to change based on final grading, servicing and full capture points

Given 5mm Retention requirement is higher than quality, quality control is satisfied (Tree Pits are sized for 5mm)

Phil Gotfried

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA
COMMUNITY COST SHARING



LEGEND

SUBJECT AREA

TREE PIT DRAINAGE AREA

SCHAEFFERS
CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

FIGURE D.2
TREE PID LID LOCATIONS

2020-4938	NOVEMBER 2022	SCALE: N.T.S.

W:\4900's\4938 - Rangeview, Mississauga\Drawings\Drainage\2022-11-09-4938-Proposed Drainage.dwg

Appendix E
Engineering Drawings

LAKESHORE RD. E (WIDENING)

LAKESHORE RD. E (WIDENING)

WESTMOUNT AVE

ALEXANDRA AVE

MEREDITH AVE

ERDELEIGH AVE

EAST AVE.

LAKEFRONT PROMENADE

PARK BLOCK

STREET 'L'

STREET 'G'

RANGEVIEW RD.

CONCESSION

Ex. LAKEVIEW WATER TREATMENT PLANT

Ex. DOUGLAS KENNEDY PARK

EX.LAKEVIEW PARK

SEE NOTE 1

T/G 83.12
E 75.78
SW 74.29

T/G 83.18
SE 75.98
W 75.93

T/G 83.32
SW 81.95
N 81.95
SE 80.25

T/G 81.84
SE 76.46
E 76.80
NW 76.41

T/G 81.75
NW 80.00
SE 80.00

T/G 81.77
NE 77.24
W 76.83

T/G 82.17
NE 79.84

T/G 82.22
NE 77.53
SW 77.47

T/G 82.64
NE 77.80
SW 77.75

T/G 82.59
SW 79.65
NE 79.65

T/G 83.02
NE 78.00
SW 78.00

T/G 83.12
SW 79.42
SE 79.42
NE 79.47

T/G 83.60
SW 78.30

T/G 83.59
SW 79.26
NE 79.26

T/G 84.00
SW 79.08
NE 79.02

T/G 84.09
NW 78.94
N 78.94
SW 78.94
SE 78.94

T/G 85.55
SW 84.04
NE 84.04
SE 79.26

T/G 85.29
SE 80.07

T/G 84.26
NE 78.98
S 78.98

T/G 84.25
NE 79.94
S 79.94

T/G 84.07
NW 79.79
N 79.89
SE 79.84

T/G 84.63
NE 79.20
SW 79.20

T/G 85.03
NE 80.21
SW 79.44

T/G 84.58
NE 80.17
SW 80.17

T/G 85.00
NE 81.16
SW 80.45

T/G 81.17
NW 79.72
NE 79.72

T/G 80.82
NE 76.92
NW 76.85

T/G 80.97
SW 79.61
NE 79.61

T/G 81.35
NE 77.92
SW 77.85

T/G 81.54
SW 79.30
NE 79.30

T/G 81.96
SW 79.10
NW 79.13
NE 79.10

T/G 81.88
NE 78.59
SW 78.40

T/G 82.75
NE 79.56
N 79.41
E 79.31
SW 79.48

T/G 82.71
SW 78.69
NE 78.67

T/G 82.88
NW 79.51
S 79.46

T/G 83.33
NE 79.03
SW 78.93

T/G 83.85
NE 79.33
SW 79.33

T/G 83.89
NE 80.38
SW 80.41

T/G 82.45
SW 78.83
NE 78.83

T/G 82.76
NE 78.63
SW 78.63
NW 78.63
SE 78.63

T/G 81.92
NW 79.60

T/G 81.55
NW 78.38
SE 78.38

T/G 80.98
NW 78.27
SE 78.27

T/G 83.17
NE 79.88
SW 79.83

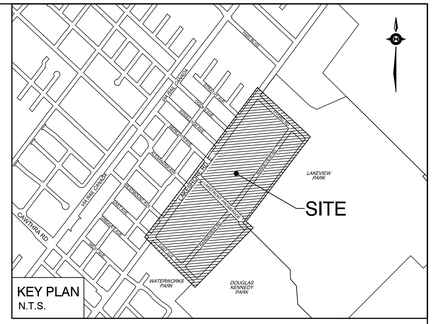
T/G 82.69
SE 79.42
W 79.36

T/G 83.55
NE 80.17
SW 80.12

T/G 83.15
SE 78.70

T/G 82.58
NW 78.54
SE 78.44

REFER TO GP-2



KEY PLAN
N.T.S.

LEGEND:

- DENOTES PROPOSED SANITARY
- DENOTES PROPOSED STORM
- WM — DENOTES PROPOSED WATERMAIN
- DENOTES PROPOSED UTILITY CORRIDOR
- DENOTES PROPOSED DISTRICT ENERGY
- DENOTES FUTURE SANITARY
- DENOTES FUTURE STORM
- DENOTES FUTURE WATERMAIN
- DENOTES EXISTING SANITARY
- DENOTES EXISTING STORM
- DENOTES EXISTING WATERMAIN
- DENOTES EXTERNAL LANDS
- T/G 84.73 / SW 80.20 — DENOTES TOP OF GRATE (T/G) AND OBVERT OF STM SEWER
- T/G 84.75 / SW 80.95 — DENOTES TOP OF GRATE (T/G) AND OBVERT OF SAN SEWER

NOTES:

1. STORM SEWER SHOWN ON OGDEN RD. AND STREET 'G', SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.

No.	Date	Issued for

BENCHMARK NOTE

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

SCHAEFFERS
CONSULTING ENGINEERS
SCHAEFFER & ASSOCIATES LTD.
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100
Fax: (905) 738-6875
E-mail: design@schaeffers.com

MISSISSAUGA Transportation and Works

PRELIMINARY GENERAL PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000		DATE: SEPTEMBER 2023
PROJECT No. 2022-4938		DRAWING No. GP-1

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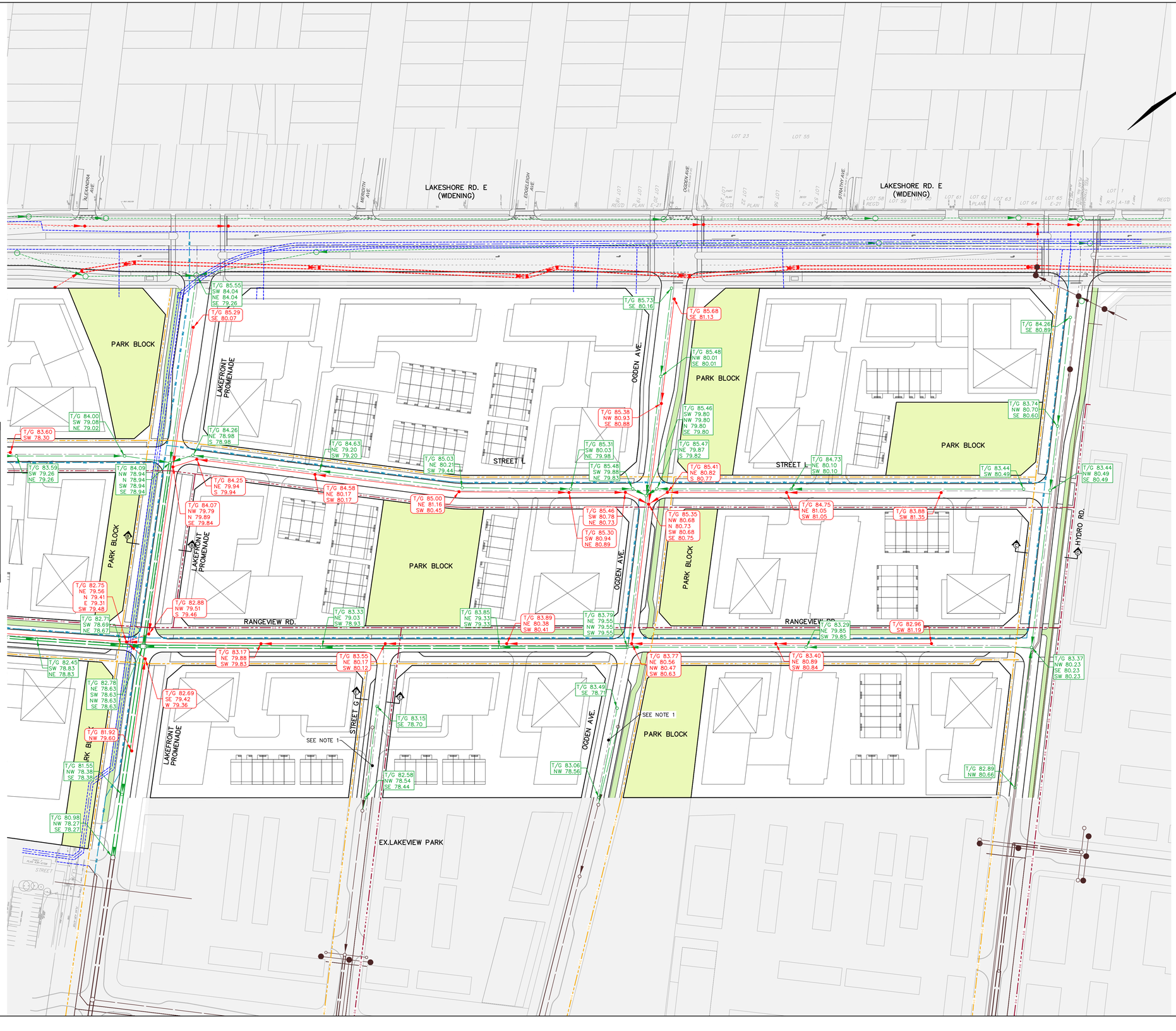

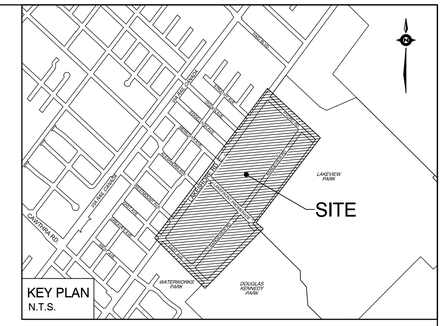

LEGEND:

- DENOTES PROPOSED SANITARY
- DENOTES PROPOSED STORM
- WM — DENOTES PROPOSED WATERMAIN
- DENOTES PROPOSED UTILITY CORRIDOR
- DENOTES PROPOSED DISTRICT ENERGY
- DENOTES FUTURE SANITARY
- DENOTES FUTURE STORM
- DENOTES FUTURE WATERMAIN
- DENOTES EXISTING SANITARY
- DENOTES EXISTING STORM
- DENOTES EXISTING WATERMAIN
- DENOTES EXTERNAL LANDS
- T/G 84.73 SW 80.20 — DENOTES TOP OF GRATE (T/G) AND OBVERT OF STM SEWER
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NOTES:

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No.	Date	Issued for

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MISSISSAUGA Transportation and Works

PRELIMINARY GENERAL PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. GP-2	

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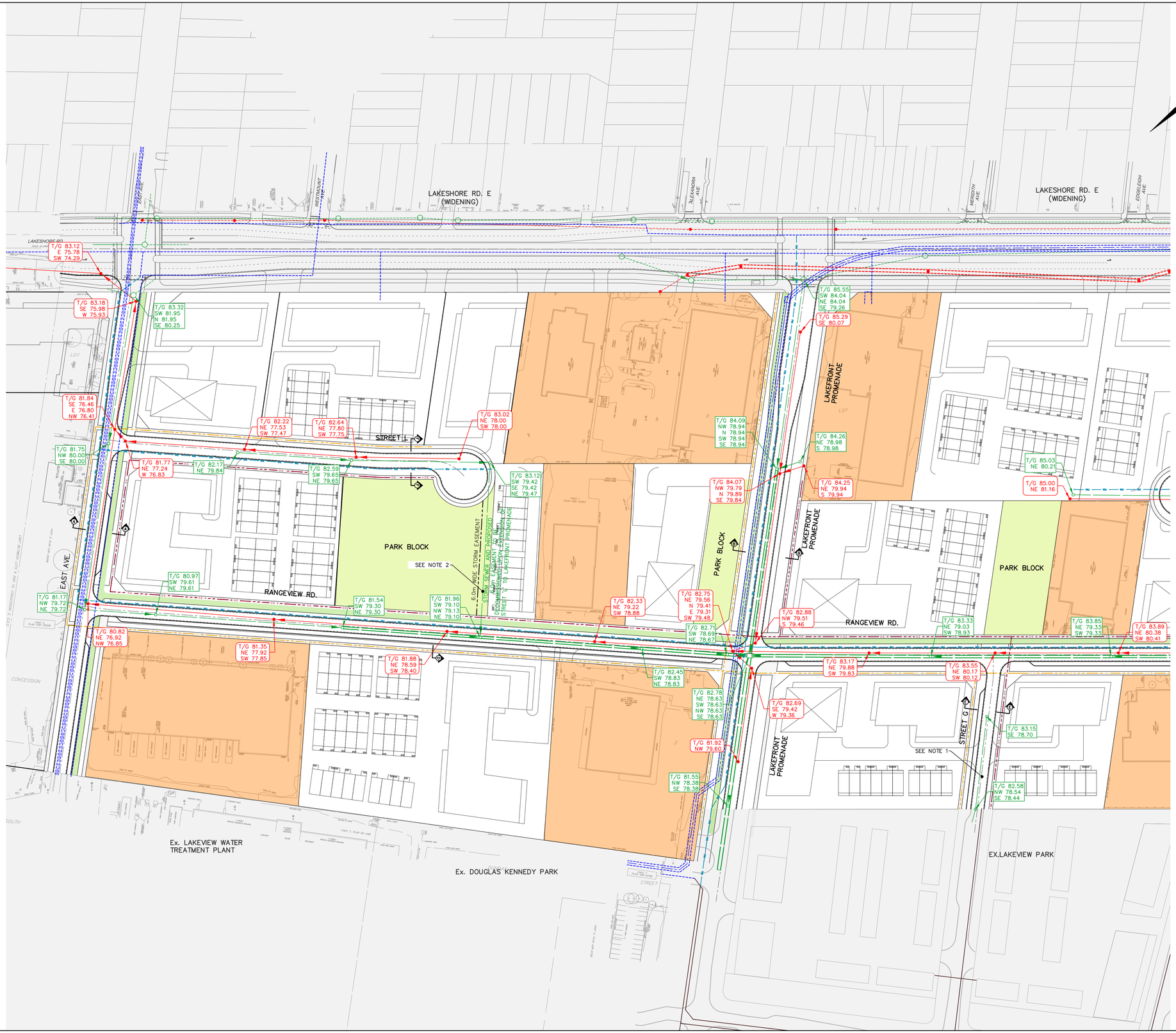

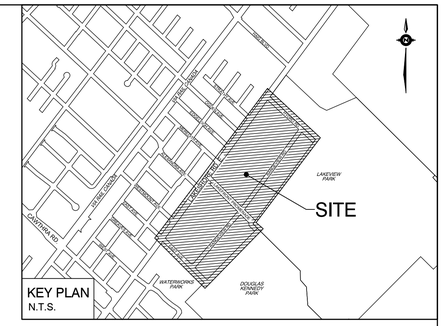

KEY PLAN
N.T.S.

LEGEND:

- DENOTES PROPOSED SANITARY
- DENOTES PROPOSED STORM
- WM — DENOTES PROPOSED WATERMAIN
- DENOTES PROPOSED UTILITY CORRIDOR
- DENOTES PROPOSED DISTRICT ENERGY
- DENOTES FUTURE SANITARY
- DENOTES FUTURE STORM
- DENOTES FUTURE WATERMAIN
- DENOTES EXISTING SANITARY
- DENOTES EXISTING STORM
- DENOTES EXISTING WATERMAIN
- DENOTES NON-PARTICIPATING LANDOWNERS
- DENOTES EXTERNAL LANDS
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- T/G 84.75 SW 80.95 — DENOTES TOP OF GRATE (T/G) AND OBVERT OF SAN SEWER

NOTES:

1. STORM SEWER SHOWN ON OGDEN RD. AND STREET "G", SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.
2. PROPOSED STORM SEWER AND EASEMENT WITHIN PARK BLOCK TO BE DECOMMISSIONED UPON EXTENSION OF STREET L TO LAKEFRONT PROMENADE.

No.	Date	Issued for

BENCHMARK NOTE

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

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MISSISSAUGA Transportation and Works

PRELIMINARY INTERIM GENERAL PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. INT.GP-1	

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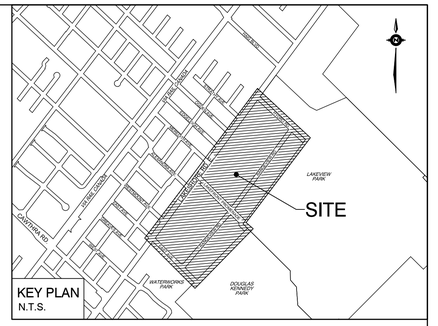
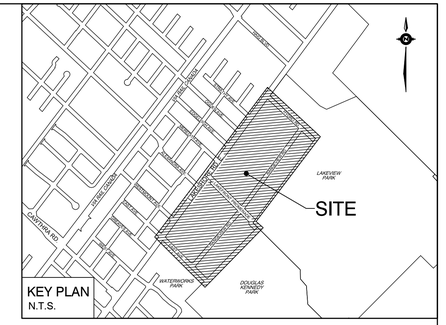
REFER TO INT.GP-1


SITE
LAKEVIEW PARK
WATERCHUTE PARK
DOUGLAS KENNEDY PARK
CRANEWAY RD
CRANEWAY RD
CRANEWAY RD





LEGEND:

225.42	DENOTES PROPOSED ℄ ELEVATION
223.25	DENOTES FUTURE GRADES (BY OTHERS)
	DENOTES EXISTING CONTOUR
	DENOTES OVERLAND FLOW DIRECTION
	DENOTES CURB & GUTTER (OPSD 600.040)
	DENOTES ROW LIMITS
	DENOTES BLOCKS
	DENOTES EXTERNAL LANDS

NOTES:

1. STORM SEWER SHOWN ON OGDEN RD. AND STREET 'G', SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.

No.	Date	Issued for

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MISSISSAUGA
Transportation and Works

PRELIMINARY GRADING PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. GR-1	

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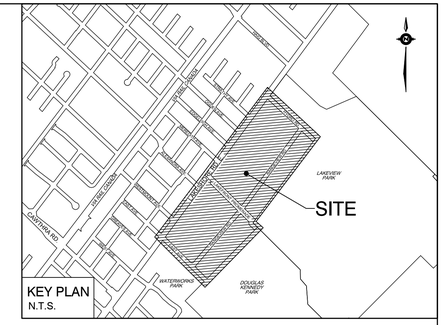

LEGEND:

225.42	DENOTES PROPOSED ℄ ELEVATION
223.25	DENOTES FUTURE GRADES (BY OTHERS)
	DENOTES EXISTING CONTOUR
	DENOTES OVERLAND FLOW DIRECTION
	DENOTES CURB & GUTTER (OPSD 600.040)
	DENOTES ROW LIMITS
	DENOTES BLOCKS
	DENOTES EXTERNAL LANDS

NOTES:

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No.	Date	Issued for

BENCHMARK NOTE

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MISSISSAUGA
Transportation and Works

PRELIMINARY GRADING PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. GR-2	

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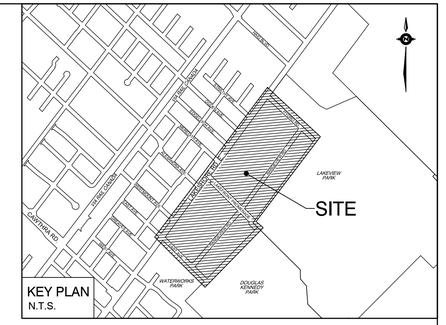

LEGEND:

- 225.42 — DENOTES PROPOSED ℄ ELEVATION
- 223.25 — DENOTES FUTURE GRADES (BY OTHERS)
- DENOTES EXISTING CONTOUR
- DENOTES OVERLAND FLOW DIRECTION
- DENOTES CURB & GUTTER (OPSD 600.040)
- DENOTES ROW LIMITS
- DENOTES BLOCKS
- DENOTES NON-PARTICIPATING LANDOWNERS
- DENOTES EXTERNAL LANDS

NOTES:

1. STORM SEWER SHOWN ON OGDEN RD. AND STREET 'G', SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.

No.	Date	Issued for

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CITY OF MISSISSAUGA

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MISSISSAUGA
Transportation and Works

PRELIMINARY INTERIM GRADING PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000		DATE: SEPTEMBER 2023
PROJECT No. 2022-4938		DRAWING No. INT.GR-1

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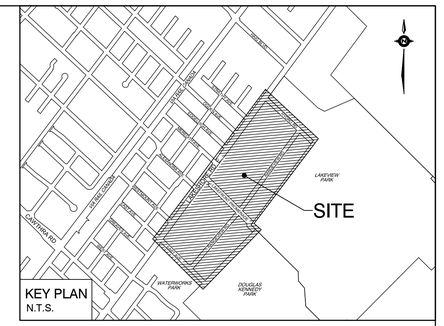

LEGEND:

- 225.42 — DENOTES PROPOSED ℄ ELEVATION
- 223.25 — DENOTES FUTURE GRADES (BY OTHERS)
- DENOTES EXISTING CONTOUR
- DENOTES OVERLAND FLOW DIRECTION
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- DENOTES EXTERNAL LANDS

NOTES:

1. STORM SEWER SHOWN ON OGDEN RD. AND STREET 'G', SOUTH OF RANGEVIEW ROAD, ARE ONLY REQUIRED TO SUPPORT POTENTIAL ROAD CONSTRUCTION.

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BENCHMARK NOTE

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MISSISSAUGA
Transportation and Works

PRELIMINARY INTERIM GRADING PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. INT.GR-2	

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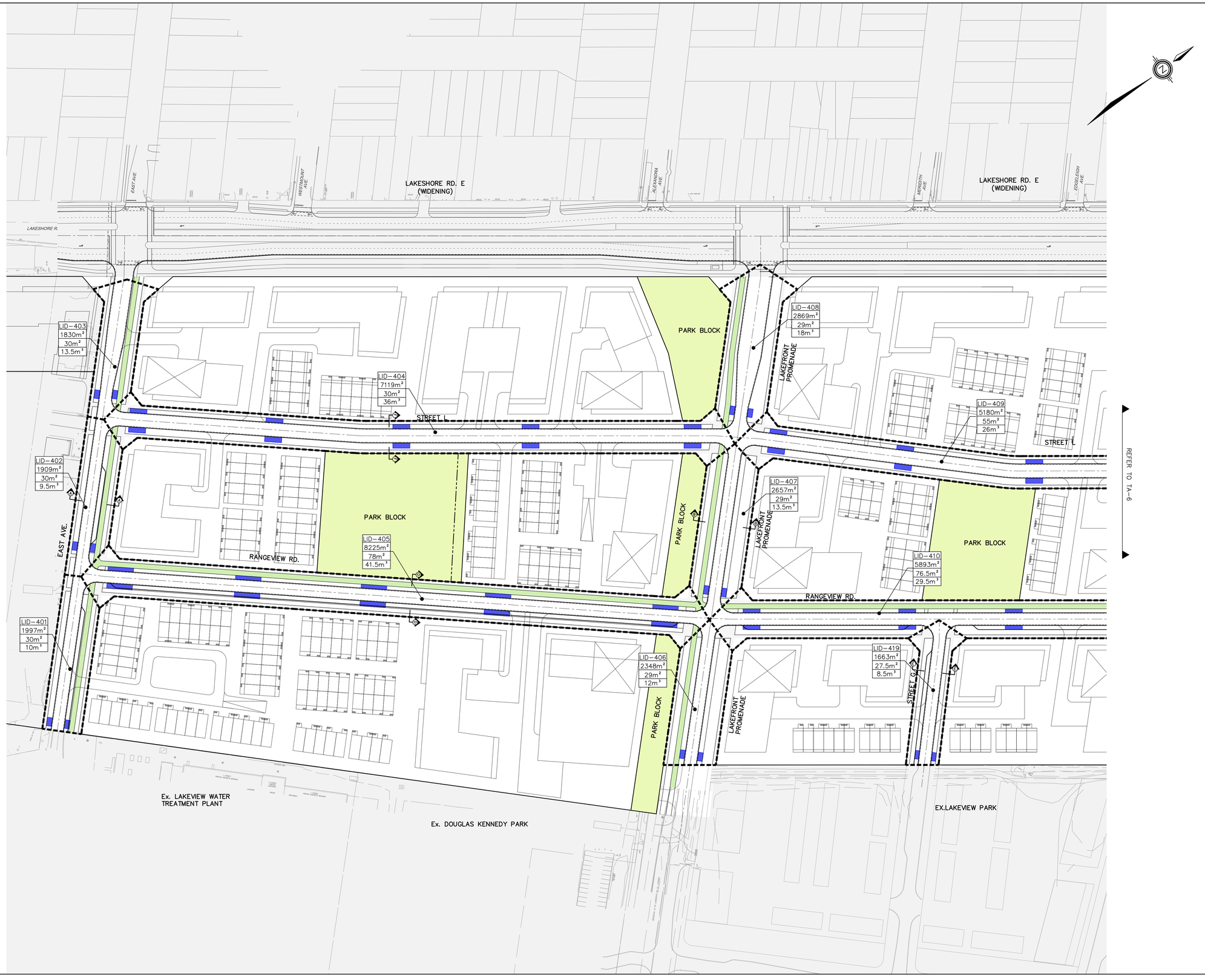

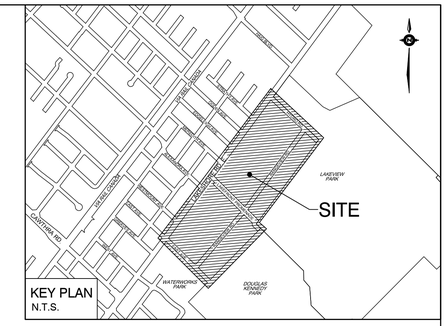

KEY PLAN
N.T.S.

LEGEND:

- DENOTES EXISTING CONTOUR
- DENOTES CURB & GUTTER (OPSD 600.040)
- DENOTES ROW LIMITS
- DENOTES BLOCKS
- DENOTES LID DRAINAGE AREA BOUNDARY
- DENOTES LID AREA
- LID-400 — DENOTES LID ID
- 1388m² — DENOTES ROW DRAINAGE AREA
- 60m² — DENOTES LID AREA
- 10m³ — DENOTES LID VOLUME

No.	Date	Issued for

BENCHMARK NOTE

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

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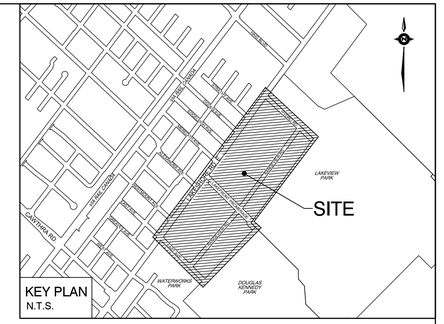
E-mail: design@schaeffers.com

MISSISSAUGA Transportation and Works

PRELIMINARY LID DRAINAGE PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. TA-5	





LEGEND:

- DENOTES EXISTING CONTOUR
- DENOTES CURB & GUTTER (OPSD 600.040)
- DENOTES ROW LIMITS
- DENOTES BLOCKS
- DENOTES LID DRAINAGE AREA BOUNDARY
- DENOTES LID AREA
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- 1388m² — DENOTES ROW DRAINAGE AREA
- 60m² — DENOTES LID AREA
- 10m³ — DENOTES LID VOLUME

No.	Date	Issued for

BENCHMARK NOTE

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

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Fax: (905) 738-6875
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MISSISSAUGA
Transportation and Works

PRELIMINARY LID DRAINAGE PLAN

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. TA-6	

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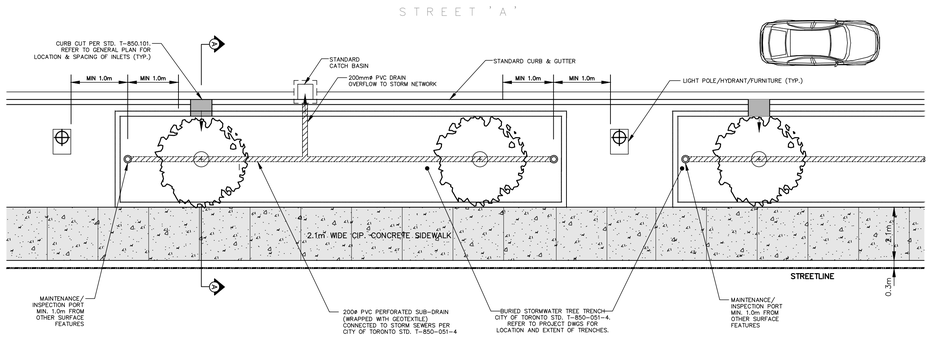
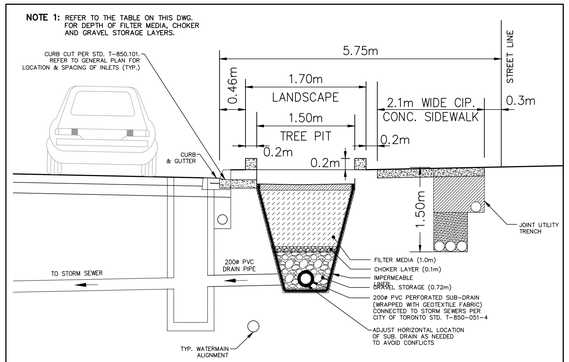


BIORETENTION PLANTER DETAIL

SCALE N.T.S.



TREE TRENCH SECTION (24.7m ROW)

SCALE N.T.S.

No.	Date	Issued for

BENCHMARK NOTE

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CITY OF MISSISSAUGA

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MISSISSAUGA Transportation and Works

DETAIL

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: 1:1000	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. D-1	

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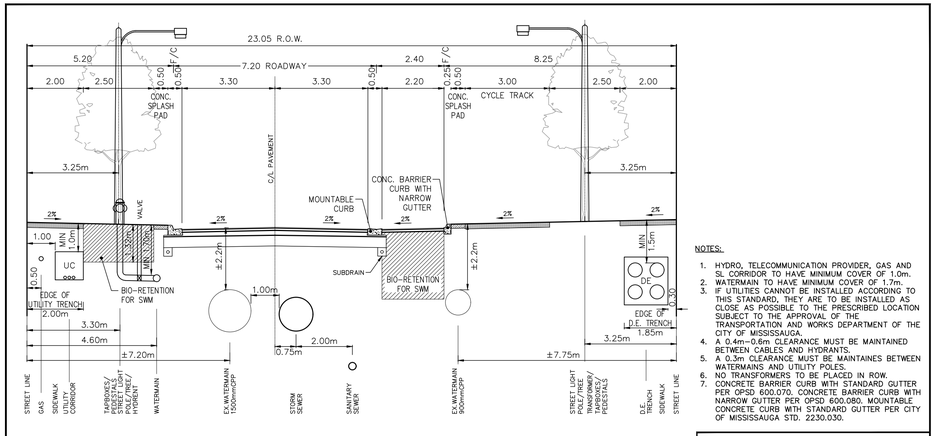


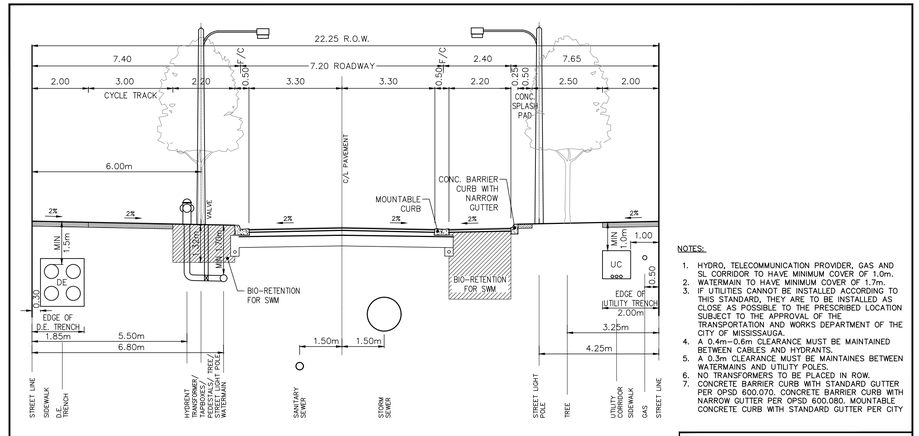
NOTES:

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE MINIMUM COVER OF 1.0m.
2. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD, THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m–0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINES BETWEEN WATERMAINS AND UTILITY POLES.
6. NO TRANSFORMERS TO BE PLACED IN ROW.
7. CONCRETE BARRIER CURB WITH STANDARD GUTTER PER OPSD 600.070. CONCRETE BARRIER CURB WITH NARROW GUTTER PER OPSD 600.080. MOUNTABLE CONCRETE CURB WITH STANDARD GUTTER PER CITY OF MISSISSAUGA STD. 2230.030.

LOCAL ROAD – SECTION A
MODIFIED 23.05m R.O.W. – 6.6m PAVEMENT

SCALE : N.T.S.

m DIMENSIONS IN METRES EXCEPT AS NOTED



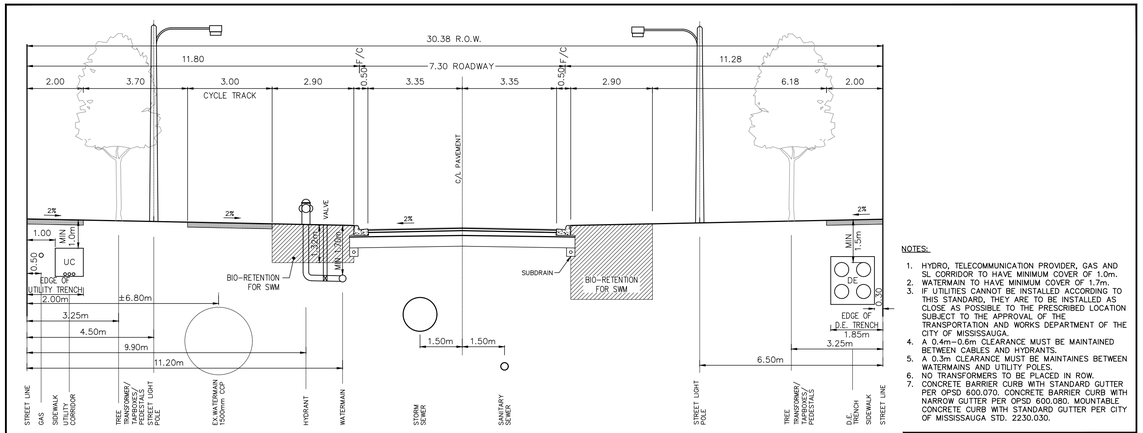
NOTES:

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE MINIMUM COVER OF 1.0m.
2. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD, THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m–0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINES BETWEEN WATERMAINS AND UTILITY POLES.
6. NO TRANSFORMERS TO BE PLACED IN ROW.
7. CONCRETE BARRIER CURB WITH STANDARD GUTTER PER OPSD 600.070. CONCRETE BARRIER CURB WITH NARROW GUTTER PER OPSD 600.080. MOUNTABLE CONCRETE CURB WITH STANDARD GUTTER PER CITY

LOCAL ROAD – SECTION D
MODIFIED 22.25m R.O.W. – 6.6m PAVEMENT

SCALE : N.T.S.

m DIMENSIONS IN METRES EXCEPT AS NOTED



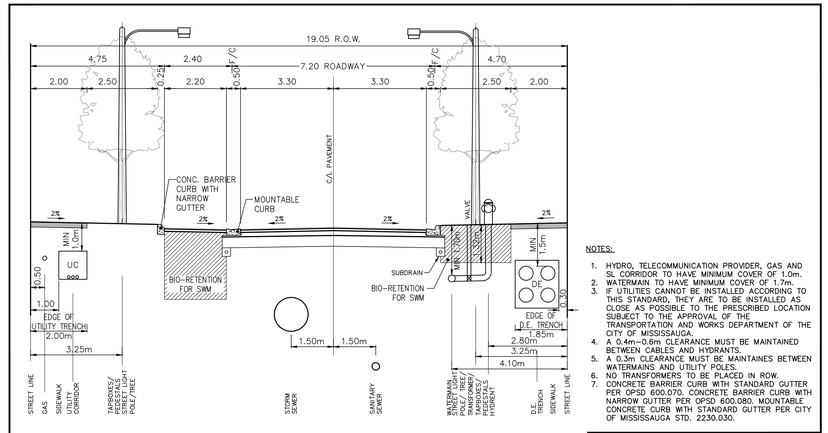
NOTES:

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE MINIMUM COVER OF 1.0m.
2. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD, THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m–0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINES BETWEEN WATERMAINS AND UTILITY POLES.
6. NO TRANSFORMERS TO BE PLACED IN ROW.
7. CONCRETE BARRIER CURB WITH STANDARD GUTTER PER OPSD 600.070. CONCRETE BARRIER CURB WITH NARROW GUTTER PER OPSD 600.080. MOUNTABLE CONCRETE CURB WITH STANDARD GUTTER PER CITY OF MISSISSAUGA STD. 2230.030.

LOCAL ROAD – SECTION B
MODIFIED 30.38m R.O.W. – 6.7m PAVEMENT

SCALE : N.T.S.

m DIMENSIONS IN METRES EXCEPT AS NOTED



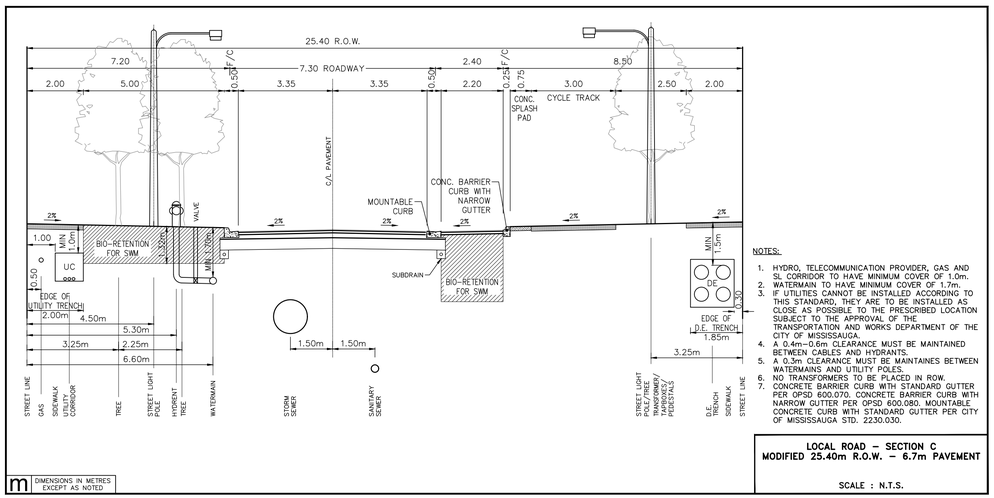
NOTES:

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE MINIMUM COVER OF 1.0m.
2. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD, THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m–0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINES BETWEEN WATERMAINS AND UTILITY POLES.
6. NO TRANSFORMERS TO BE PLACED IN ROW.
7. CONCRETE BARRIER CURB WITH STANDARD GUTTER PER OPSD 600.070. CONCRETE BARRIER CURB WITH NARROW GUTTER PER OPSD 600.080. MOUNTABLE CONCRETE CURB WITH STANDARD GUTTER PER CITY OF MISSISSAUGA STD. 2230.030.

LOCAL ROAD – SECTION E
MODIFIED 19.05m R.O.W. – 6.6m PAVEMENT

SCALE : N.T.S.

m DIMENSIONS IN METRES EXCEPT AS NOTED



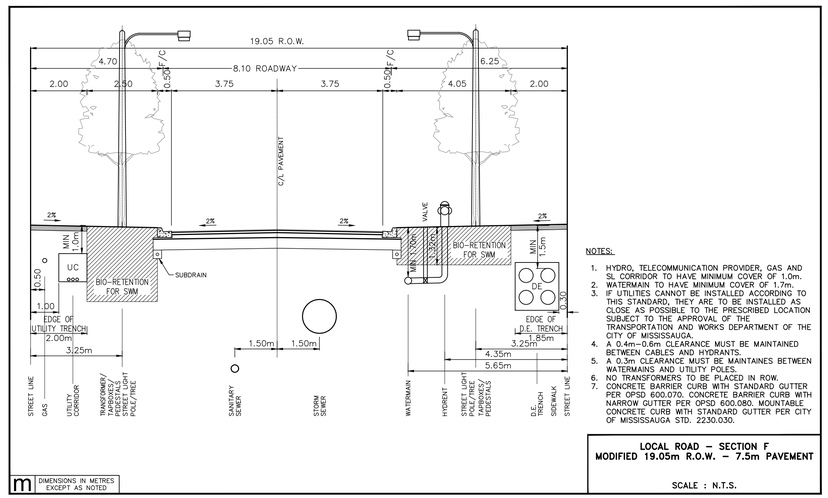
NOTES:

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE MINIMUM COVER OF 1.0m.
2. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD, THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m–0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINES BETWEEN WATERMAINS AND UTILITY POLES.
6. NO TRANSFORMERS TO BE PLACED IN ROW.
7. CONCRETE BARRIER CURB WITH STANDARD GUTTER PER OPSD 600.070. CONCRETE BARRIER CURB WITH NARROW GUTTER PER OPSD 600.080. MOUNTABLE CONCRETE CURB WITH STANDARD GUTTER PER CITY OF MISSISSAUGA STD. 2230.030.

LOCAL ROAD – SECTION C
MODIFIED 25.40m R.O.W. – 6.7m PAVEMENT

SCALE : N.T.S.

m DIMENSIONS IN METRES EXCEPT AS NOTED



NOTES:

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE MINIMUM COVER OF 1.0m.
2. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD, THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m–0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINES BETWEEN WATERMAINS AND UTILITY POLES.
6. NO TRANSFORMERS TO BE PLACED IN ROW.
7. CONCRETE BARRIER CURB WITH STANDARD GUTTER PER OPSD 600.070. CONCRETE BARRIER CURB WITH NARROW GUTTER PER OPSD 600.080. MOUNTABLE CONCRETE CURB WITH STANDARD GUTTER PER CITY OF MISSISSAUGA STD. 2230.030.

LOCAL ROAD – SECTION F
MODIFIED 19.05m R.O.W. – 7.5m PAVEMENT

SCALE : N.T.S.

m DIMENSIONS IN METRES EXCEPT AS NOTED

No.	Date	Issued for

BENCHMARK NOTE

RANGEVIEW ESTATES PRECINCT AREA
CITY OF MISSISSAUGA

SCHAEFFERS
CONSULTING ENGINEERS
SCHAEFFER & ASSOCIATES LTD.
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100
Fax: (905) 738-6875
E-mail: design@schaeffers.com

MISSISSAUGA Transportation and Works

PUBLIC RIGHT-OF-WAY SECTIONS

DRAWN BY: M.P.	DESIGNED BY: H.H.T.	CHECKED BY: H.H.T.
SCALE: AS SHOWN	DATE: SEPTEMBER 2023	
PROJECT No. 2022-4938	DRAWING No. D–2	

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